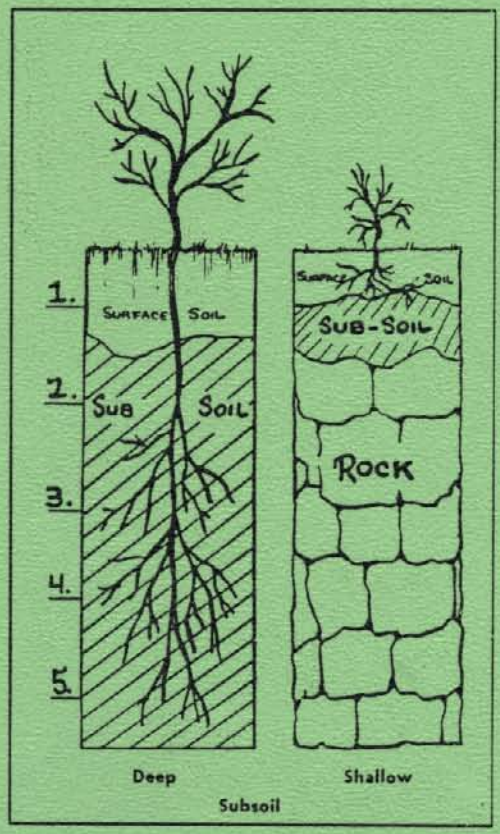
Soil Laboratory Data, Field Descriptions and Field Measured Soil Water Limits for Some Soils of the United States

J. T. Ritchie, L. F. Ratliff and D. K. Cassel



ARS Technical Bulletin

September 1987

SOIL LABORATORY DATA, FIELD DESCRIPTIONS AND FIELD MEASURED SOIL WATER LIMITS FOR SOME SOILS OF THE UNITED STATES[1]

J. T. RITCHIE[2], L. F. RATLIFF[3] and D. K. CASSEL[4]

---

[1]Contribution from the USDA, Agricultural Research Service and Soil Conservation Service, in cooperation with State Agricultural Experiment Stations.

[2]Professor, Homer Nowlin Chair, Department of Crop and Soil Sciences, Plant and Soil Sciences Building, Michigan State University, East Lansing, MI 48824; formerly Research Leader, Crops Systems Evaluation Research Unit, USDA-ARS, P.O. Box 6112, Temple, TX 76503.

[3]Soil Scientist, USDA-SCS, P.O. Box 6567, Fort Worth, TX 76115.

[4]Professor, Department of Soil Science, North Carolina State University, Raleigh, NC 27650.

CONTENTS

CONTENTS

PREFACE

This report was compiled to provide a data base for estimating field-measured soil water limits from soil physical and chemical properties. Appendix A contains laboratory data, pedon descriptions, and field-measured soil water limits of some important agricultural soils from fifteen states. The methods of compiling and analyzing the data base and some equations for estimating the field measured soil water limits have been reported (Ratliff et al. 1983; Cassel et al. 1983).

The soil descriptions prepared specifically for this report were mainly to describe the soil features thought to affect soil water retention. These descriptions were edited to agree with laboratory measurements of soil texture and pH. Eight of the descriptions, which were prepared for other objectives, contain detailed information pertinent to that specific investigation. These descriptions were minimally edited to preserve the original descriptive data.

The soil analyses were made at the National Soil Survey Laboratory, Lincoln, Nebraska. Methods of the analyses are identified by symbols in the column headings of the data tables and are described in Soil Survey Investigations Report No. 1 (USDA 1972, Revised 1984). Appendix A includes examples of data tables and a brief description of the data element in each column of the computer printed data sheets.

The field-measured soil water limits of each soil are shown in graph and table form. These data were contributed by research scientists throughout the United States. The name and location of the contributors are shown at the bottom of each pedon description. Their contribution is gratefully acknowledged.

The soil pedons were classified from 1980 to 1982. Pedons that have one or more properties outside the limits of an established soil series but are otherwise similar are named as a phase, taxadjunct or variant to the named series. The differences are described in the "Remarks" section of the pedon description. Pedons that are not within or near the limits of recognized series are classified to the family level and are identified as "Series Not Designated." In the text, pedons are arranged alphabetically by series name.

ACKNOWLEDGMENTS

The data presented in this report came from scientists in many parts of the United States; therefore, it is not possible to individually recognize each of them. Appreciation is extended to those scientists who assisted in the inventory of existing soil water studies. The cooperation and hospitality of those who provided the field-measured soil water data is gratefully acknowledged. Appreciation is also expressed to the soil scientists and technicians who assisted in describing, sampling, processing and reviewing the soils data.

Special thanks is given to Dr. P. T. Dyke, Economic Research Service, and Oliver Rice, Soil Conservation Service, for their help in the statistical analyses and data interpretation.

Most of the work was done while Dr. Cassel was a visiting scientist at USDA-ARS, Temple, Texas.

ACKNOWLEDGMENTS

The data presented in this report came from scientists in many parts of the United States; therefore, it is not possible to individually recognize each of them. Appreciation is extended to those scientists who assisted in the inventory of existing soil water studies. The cooperation and hospitality of those who provided the field-measured soil water data is gratefully acknowledged. Appreciation is also expressed to the soil scientists and technicians who assisted in describing, sampling, processing and reviewing the soils data.

Special thanks is given to Dr. P. T. Dyke, Research Service, and Oliver Bliss, Soil Conservation Service, for their help in the statistical analyses and data interpretation.

Most of the work was done while Dr. Cassel was a visiting scientist at USDA-ARS, Temple, Texas.

ILLUSTRATIONS

Figures

Tables

SOIL LABORATORY DATA, FIELD DESCRIPTIONS AND FIELD MEASURED SOIL WATER LIMITS FOR SOME SOILS OF THE UNITED STATES

J. T. RITCHIE, L. F. RATLIFF AND D. K. CASSEL

INTRODUCTION

Evaluating the capacity of the soil water reservoir requires knowledge of its upper and lower limits in the plant root zone. The most common procedure for estimating the upper limit water content is to extract water from a disturbed or undisturbed soil sample using a soil water extraction apparatus or "pressure chamber" (Richards and Weaver 1943). A matric potential of -0.33 bar is used for moderately coarse- and finer-textured soils; a -0.10 bar potential is used for coarse-textured soils (Jamison and Kroth 1958; Colman 1947). The lower limit water content is estimated using a pressure chamber at a matric potential of -15 bars. The soil water reservoir for a soil profile is estimated by collecting soil samples from the different soil horizons or depths, determining the water content at the upper and lower limits for each horizon, and summing the differences over the entire rooting depth.

Laboratory methods for estimating the soil water reservoir have been criticized (Richards 1960; Gardner 1966; Ritchie 1981). Some argue that plants remove water from the soil at matric potentials <-15 bars. Others say that plants may not remove water to a matric potential of -15 bars. Few have reported field-measured values of the matric potential at the lower limit. For the upper limit, field measurements often do not agree with values estimated using the -0.10 and -0.33 bar pressure apparatus in the laboratory. Estimates of the upper limit made by using the pressure chamber for different depths of a single soil profile may overestimate in situ measurements at some depths, underestimate it at others, and be nearly equal to it at still others (Cassel and Sweeney 1974). In addition, the laboratory method of estimating soil water limits is expensive and time-consuming, requiring a careful collection of undistributed soil cores, an investment in laboratory pressure extraction equipment, and regular monitoring by trained technicians.

Because of the problems in estimating the limits of the soil water reservoir, a joint effort between the Soil Conservation Service (SCS) and the Agricultural Research Service (ARS) was initiated in April 1980. The objective was to assemble a comprehensive data base of field-measured upper and lower soil water limits for a broad range of soils throughout the United States. The purposes of the study were

(a) to provide a data base of field-measured soil water limits, (b) to assess the value of laboratory measurements for estimating the field soil water limits, and (c) to determine if alternative techniques might be used to accurately evaluate the soil water reservoir.

This report summarizes the procedures used in compiling and analyzing the data, compares the laboratory estimates of the soil water limits with field measurements, and reports models for estimating the potential upper and lower water limits of soils based on routinely measured soil physical and chemical properties. Appendix A includes laboratory data, pedon descriptions, and field-measured soil water limits of the soils included in the data base. Much of the discussion presented in this report plus some additional details on the data base and data analysis are discussed in Ratliff et al. (1983).

PROCEDURES

Soil selection process. To develop a data base encompassing a broad range of soils with respect to texture and other chemical and physical properties, both published and unpublished data meeting certain criteria were collected, summarized, and tabulated. Initially a literature review was conducted to locate published data on upper and lower limits measured in situ. After the literature review about 250 questionnaires were sent to state and federal institutions, soil physics or soil water management programs and to researchers who were conducting or had recently conducted research that included field measurements of soil water content under various crops. The questionnaire was designed to identify studies where: (a) the crops had undergone severe water stress, (b) the soil water content had been measured throughout the rooting zone periodically during the stress period, and (c) the water content measurement sites could be precisely located. Applicable data came from 28 respondents who agreed to contribute to the survey.

After identifying the soils to be included in the data base, the sites were visited, the in situ-measured water content data were discussed with the researcher, the soils were described, and soil samples were collected. At one location eight soil sites had previously been described and sampled by individuals experienced in soil classification. These soil samples had been submitted to the same laboratory being used in this study. The resulting analyses were included in the data base. The soil-geomorphic setting, soil classification and some of the data for these eight pedons in Bailey County, Texas, have been previously discussed (for Pedon Nos. S75TX-17-4 through S75TX-17-8, Gile (1979); for

Pedon Nos. S75TX-17-1 through S75TX-17-3, Gile (1981)). In these publications the classification of some pedons is different from their classification in this report.

Eighteen months were required to assemble the data base. During the study, several other sets of water limit data were identified. However, none were used in the analysis because the data and soil properties were either similar to those of soils already included in the data base or the cost of obtaining a single data set from one location was prohibitive.

Methods for defining the soil water limits. The methods used to define the in situ upper and lower limits of the soil water reservoir available to plants was similar to that described by Franzmeier et al. (1973) and Ritchie (1981). Slight modifications were required to accommodate the various experimental approaches used by investigators throughout the United States. Comparing the methods presented below with the above references will show the differences.

To maintain uniformity, we defined the water limits to be investigated before accumulating the data base as (a) drained upper limit (DUL)--the highest field-measured water content of a soil after it had been thoroughly wetted and allowed to drain until drainage became practically negligible; (b) lower limit (LOL)--the lowest field-measured water content of a soil after plants had stopped extracting water and were at or near premature death or became dormant as a result of water stress; and (c) potential extractable soil water (PLEXW)--the difference in water content between DUL and LOL. These parameters--DUL, LOL, and PLEXW--are expressed in percent by volume.

The DUL was derived by analyzing successive measurements of soil water content versus time after the soil had been thoroughly wetted by irrigation or precipitation and allowed to drain. Successive measurements of such a thoroughly wetted soil exhibit a monotonic decrease in soil water with time until the drainage rate becomes negligible. The soil profile was considered to attain a negligible drainage rate and to reach the DUL when the water content decrease was about 0.1 to 0.2 percent water content per day. Some soil sites had been covered with rainfall shelters or plastic sheeting which prevented evaporation losses or precipitation gains of water. Other plots were uncovered and subjected to the above gains and losses. Typically, 2 to 12 days were required for soils to reach the DUL. Some fine-textured soils and soils with restrictive layers required up to 20 days of drainage.

The LOL was derived from successive measurements of soil water content when a field crop was under severe water stress. Water content measurements were continued until the plant died, nearly died, or became dormant. Data from adequately fertilized field plots where plants had reached maximum vegetative growth before undergoing severe water stress were preferentially selected over data from plots inadequately fertilized or early-season stressed. The DUL and LOL were not always measured during the same year. The DUL values generally were made when precipitation or irrigation additions of water were unusually high and the soil profile was thoroughly wetted. Conversely, the LOL values were generally made in unusually dry years or following a prolonged dry period when plant water demands were high. The data shown on the graphs of the "field-measured soil water limits" (Appendix A) are for the year when the LOL measurements were made.

Although extremely useful, there were some inadequacies in the data. The definitions and methods of the selecting the DUL and LOL were designed to identify the limits of the soil water reservoir for drained soil. They do not include water that can be taken up by plants while drainage is occurring (Ritchie 1981). Evaporative losses of soil water from the soil surface or from near soil surface layers of uncovered plots result in an underestimation of DUL. Similarly, soil evaporation causes an underestimation of LOL for layers near the soil surface. Also, there is a rooting depth below which root density is inadequate for complete extraction of available soil water, and thus causing an overestimation of the water content at the LOL.

These conditions were recognized before compiling the data base. The following procedures were used to minimize underestimation of DUL and LOL and overestimation of LOL. All field-measured soil water limits of LOL, DUL, and PLEXW were plotted versus depth for each soil profile (Appendix A). Possible LOL and DUL values near the soil surface that appeared to be affected by soil evaporation and those that appeared to have inadequate root density and hence, incomplete water extraction, were identified by visual inspection and omitted. The values included in the comparison and data analysis are those between the dashed lines on the graphs of the field-measured soil water limits (Appendix A). This method of selection resulted in 401 observations of DUL, LOL and PLEXW where the effects of evaporation and inadequate root ramification were minimal.

Additional soil measurements. At each location, the soil was described and sampled as close as possible to the point at which the soil water content was measured when DUL and LOL were being determined. The soils were described

using the terminology of the Soil Survey Manual (USDA 1951) and supplements (1962). The description of plant roots in the pedon description cannot be directly related to the LOL water content since the soils were often described and sampled several years after the LOL measurements were made. About 3 to 5 kg of disturbed soil material and duplicate 5-cm thick and 7-cm diameter undisturbed soil cores were collected at depth increments that coincided with the depth of water measurement and/or soil horizon. All samples were shipped to the National Soil Survey Laboratory, Lincoln, Nebraska, for analysis by procedures described in Soil Survey Investigations Report No. 1 (USDA 1972, Revised 1984).

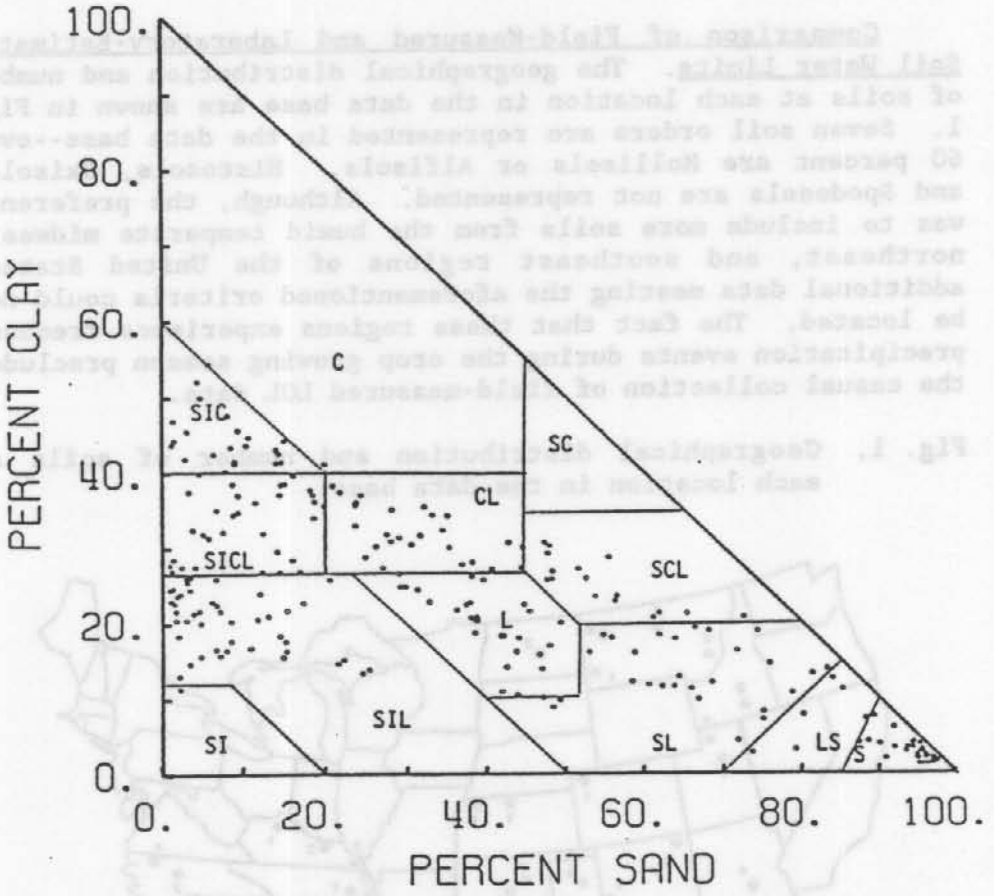
RESULTS AND DISCUSSION

Comparison of Field-Measured and Laboratory-Estimated Soil Water Limits. The geographical distribution and number of soils at each location in the data base are shown in Fig. 1. Seven soil orders are represented in the data base--over 60 percent are Mollisols or Alfisols. Histosols, Oxisols, and Spodosols are not represented. Although, the preference was to include more soils from the humid temperate midwest, northeast, and southeast regions of the United States, additional data meeting the aforementioned criteria could not be located. The fact that these regions experience frequent precipitation events during the crop growing season precludes the casual collection of field-measured LOL data.

Fig. 1. Geographical distribution and number of soils at each location in the data base.

In Fig. 2 is seen the textural distribution of the 401 observations available for comparison of the laboratory-measured -15 bar water limits with the field-measured lower limits. A total of 282 observations of -0.33 bar measurements were available for comparison with the field-measured upper limits. Some samples that had nearly identical textures appear as single points on the graph. The number of samples and the observed range of sand, silt, and clay for each textural class are presented in Table 1. All textural classes were well represented except for sandy clay, silt, and clay.

Fig. 2. Textural distribution of the 401 observations in the data base.



The mean and standard deviation for DUL, LOL, and PLEXW for each textural class are also shown in Table 1. All water content values are expressed as percent by volume. Values of the DUL range from a minimum of 11.8 $\pm$ 4.9 for sand to a maximum of 35.0 $\pm$ 6.2 for silty clay. The LOL ranged from a minimum of 3.8 $\pm$ 2.2 for sand to a maximum of 21.9 $\pm$ 1.0 for clay (based on only three observations).

Table 1. Texture and water retention data by textural class for the 401 observations.

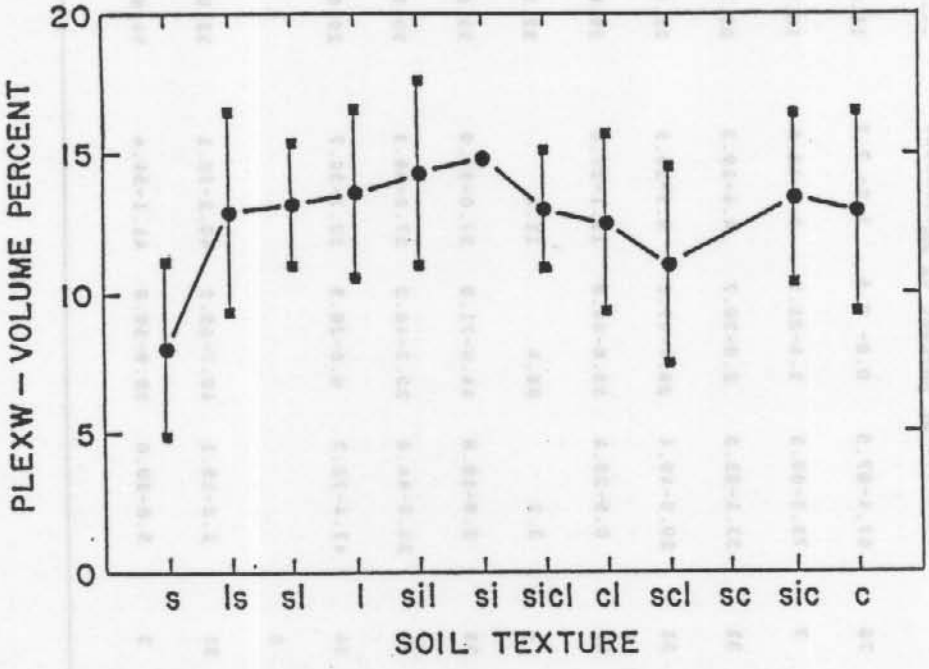
Texture	No. of Samples	Soil Separate			Upper Limit		Lower Limit		PLEXW	WRD
		Sand	Silt	Clay	DUL	-0.33 bar	LOL	-15 bar	(DUL-LOL)	(-0.33 bar - -15 bar)
		wt percent <2 mm			volume percent					
s	76	87.4-97.5	0.8- 8.5	1.2- 7.7	11.8 ± 4.9	8.9 ± 2.2	3.8 ± 2.2	3.3 ± 1.3	8.0 ± 3.1	5.6 ± 1.9
ls	7	73.7-88.3	3.4-23.5	2.8-12.6	18.9 ± 6.0	16.0 ± 5.3	5.9 ± 4.0	4.4 ± 2.3	12.9 ± 3.6	11.6 ± 3.3
sl	31	53.1-83.3	2.8-30.7	4.4-19.3	23.7 ± 5.4	21.4 ± 5.5	10.5 ± 5.2	9.9 ± 2.0	13.2 ± 2.2	11.5 ± 3.9
l	51	29.0-49.4	29.7-47.1	8.9-26.9	25.0 ± 5.1	25.2 ± 3.9	11.4 ± 4.5	13.8 ± 4.0	13.6 ± 3.0	11.4 ± 3.3
sil	83	0.9-25.4	53.6-84.8	13.1-27.0	29.0 ± 7.0	31.6 ± 4.1	14.7 ± 5.9	13.0 ± 2.3	14.3 ± 3.3	18.6 ± 3.1
si	1	2.2	86.4	11.4	32.3	36.1	17.5	6.9	14.8	25.4
sicl	53	0.9-18.8	44.0-71.8	27.0-39.9	33.8 ± 3.5	34.9 ± 2.8	20.8 ± 3.4	20.8 ± 2.6	13.0 ± 2.1	14.1 ± 3.6
cl	41	20.0-44.6	25.3-46.2	27.2-38.3	30.9 ± 4.5	33.0 ± 4.4	18.4 ± 4.9	19.2 ± 3.8	12.5 ± 3.2	13.8 ± 4.2
scl	24	47.4-72.7	6.6-26.5	20.7-30.7	29.0 ± 3.6	26.3 ± 3.3	18.0 ± 5.2	15.0 ± 2.7	11.0 ± 3.5	11.3 ± 2.4
sc	0									
sic	31	1.2-15.1	40.7-55.2	40.2-52.1	35.0 ± 6.2	37.3 ± 3.3	21.5 ± 6.8	24.1 ± 5.4	13.4 ± 3.0	13.2 ± 3.4
c	3	5.8-20.0	38.9-39.8	41.1-54.4	34.8 ± 2.9	39.3 ± 1.0	21.9 ± 1.0	27.0 ± 1.0	12.9 ± 3.6	12.3 ± 1.3

The mean and standard deviation for the -0.33 and -15 bar determinations for each textural class are included in Table 1. The -0.33 bar determination overestimated by 2.0 volume percent or more the DULs for silt loam, clay loam, silty clay, and clay; underestimates by 2.0 volume percent or more the DULs for sand, loamy sand, sandy loam, and sandy clay loam; and is within $\pm$ 2.0 volume percent for loam and silty clay loam. A better laboratory procedure to estimate the DUL for sand and loamy sand would be -0.10 bar; however, incomplete data for the -0.10 bar value precluded such a comparison. The -15 bar determination overestimates by 1.0 volume percent or more the LOL for loam, silty clay, and clay; underestimates by 1.0 volume percent for more the LOL for loamy sand, silt loam, and sandy clay loam; and estimates within $\pm$ 1.0 volume percent the LOL for sand, sandy loam, silty clay loam, and clay loam.

In general, the standard deviations for the -0.33 and -15 bar determinations are less than those for the corresponding DUL and LOL determinations. The higher standard deviations for the field-measured values are thought to be attributable primarily to errors associated with the field measurements of water obtained by different techniques and different personnel.

The mean and standard deviation for PLEXW, which is equal to DUL minus LOL, are also shown in Table 1 and are plotted as a function of soil textural class in Fig. 3.

Fig. 3. Field-measured PLEXW as a function of soil textural class.



The values range from a minimum of 8.0 $\pm$ 3.1 for sand to 14.8 for just one observation for the silt. The second highest value is 14.3 $\pm$ 3.3 for silt loam. The sand, as expected, has the least PLEXW because the large pores in sandy soils drain easily and rapidly under field conditions; moreover, the particle surface area is low resulting in little adsorbed water at the LOL. The mean PLEXW values for the remaining textural classes are relatively constant with a range of only 11.0 to 14.8 volume percent. The associated standard deviations range from 2.1 to 3.6 volume percent. The values support the concept that plant available water increases with fineness of texture up to silt loam but suggests that the amount of increase is not large.

The water retention difference (WRD) defined in Table 1 as -0.33 bar minus -15 bar, ranges from a minimum of 5.6 $\pm$ 1.9 for sand to a maximum of 18.6 $\pm$ 3.1 for silt loam. Silt has been omitted from the discussion because only one observation was available. Comparison of WRD with PLEXW reveals that WRD overestimated by 1.0 volume percent or more the observed PLEXW for silt loam, silty clay loam, and clay loam; underestimated by 1.0 volume percent or more PLEXW for sand, loamy sand, sandy loam, and loam; and estimated PLEXW to within $\pm$1.0 volume percent for sandy clay loam, silty clay, and clay. For each of the textural classes except silt loam and silt, the mean WRD was within one standard deviation of the mean PLEXW.

To determine if the field-measured limits were significantly different from the laboratory-estimated limits, a "t" statistic was calculated for the following comparisons for each textural class: DUL versus -0.33 bar; LOL versus -15 bar; and PLEXW versus WRD. Results of these analyses are shown in Table 2. Examination of the table shows that one or more comparisons were significantly different at the 0.10 level, usually at the 0.05 level, for all textural classes except loamy sand and clay loam. However, the PLEXW and WRD values were significantly different only for sand, loam, silt loam, and silty clay loam.

Soils in the data base we assembled were mostly deep and moderately well or better drained. Soils having root restrictive layers were included in the data base, but since root density in the restrictive layers was generally inadequate for complete water removal, the values were excluded from the data reported herein. We also recognize that some of the variation in the field-measured soil water data results from variations in techniques used by the investigators providing the data and from natural within-site soil variations. Assuming the errors due to variation in measuring technique and soil heterogeneity are random, our comparisons between field-measured limits and laboratory-

estimated limits should be valid. The results suggest that laboratory-estimates of the soil water limits generally provide good estimates of field-measured soil water limits, but field-measured limits are a more accurate alternative, especially if used to test the accuracy of a water balance model in a specific field.

Table 2. Results of t-test for paired comparison between field-measured and laboratory-estimated soil water limits for each textural class.

Texture	DUL Versus -0.33 bar	LOL Versus -15 bars	PLEXW Versus WRD
s	*	*	*
ls	NS	NS	NS
sl	*	NS	NS
l	NS	*	*
sil	*	*	*
si	--	--	--
sicl	*	NS	*
cl	NS	NS	NS
scl	*	*	NS
sic	**	*	NS
c	NS	*	NS

* and ** indicate significant differences at the 0.05 and 0.10 levels, respectively. NS indicated not significant at the 0.01 level.

A Model for Estimating Extractable Soil Water Limits. As indicated in the results from the comparison of field-measured and laboratory-estimates of extractable water, field-measured limits are usually better than can be obtained using laboratory methods. Therefore, we sought to develop a model from the field data collected in this study that would be applicable to most mineral soils if direct field measurements are not available.

Earlier studies have related laboratory estimated upper and lower limits to various soil properties using regression techniques. Many found that the estimated soil water parameters significantly correlated with one or more soil particle-size classes (Petersen et al. 1968a, 1968b; Gupta and Larson 1979; Salter and Williams 1965; Oosterweld and Chang 1980; Rivers and Shipp 1972). Also correlated with

water retention in some cases were organic matter and organic carbon (Gupta and Larson 1979; Hollis et al. 1977; Jamison and Kroth 1958), coarse fragments (Rivers and Shipp 1972; Hanson and Blevins 1979), and bulk density (Petersen et al. 1968a; Gupta and Larson 1979). Two studies use in situ field capacity measurements rather than laboratory measurements (Rivers and Shipp 1972; Cassel and Sweeney 1974).

Using the data base collected in this study, Cassel et al. (1983) used regression analyses to determine correlation of individual soil properties with each extractable soil water limit. Properties with the highest simple correlation with the extractable water limits were selected as possible variables to use in multiple regression equations for estimating the extractable water limits. Four levels of equations were derived. Each level corresponded to a different number of soil properties used as independent variables: two, four, nine, and ten. Separate regression equations for certain textural groupings provided more accurate estimates of the in situ potential extractable water limits.

Although the models developed in the Cassel et al. (1983) paper provided good fit to the soils contained in this report, when the model was used on a much broader base of soil types for prediction throughout the United States in the Erosion Productivity Impact Calculator (EPIC, Williams et al. 1983), the model often gave unreasonable values for the soil water limits. This was especially true for the methods that used the most soil properties.

Because of the difficulty of extrapolation of the models in the Cassel et al. (1983) paper to soils outside the range of soil properties found in this study, we sought a more general set of equations that would apply to broad textural groupings and that would give values in general agreement with this study. Development of the model revealed that several of the samples from eight pedons at rangeland sites that contained some woody vegetation had considerably more variation in the LOL or DUL than the other samples in the study that were taken from cropland. Thus samples from the eight rangeland pedons were removed from the data base for the development of this alternative model for the extractable soil water limits.

For better accuracy in the model, we found that separate equations were needed for various ranges of soil textures. For soil with sand percent greater or equal to 75 percent, the following equations are used to estimate LOL and PLEXW:

$$LOL_m = 18.8 - 0.168 \times Sand \quad \text{Sand} \geq 75\% \quad [1]$$

$$PLEXW_m = 42.3 - 0.381 \times Sand \quad [2]$$

where the subscript m is used with estimated values of the water content limits for mineral soils. In the equations 1 and 2 above and in subsequent equations, sand, silt or clay refer to percent by weight of the <2 mm soil particles and water contents are in volume percent. For sand less than 75 percent, soils are separated into two groups according to their silt content for LOL_m:

$$LOL_m = 3.62 + 0.444 \times Clay \quad \text{Sand} < 75\%,\ \text{Silt} < 70\% \quad [3]$$

$$LOL_m = 5.0 + 0.0244 \times Clay^2 \quad \text{Sand} < 75\%,\ \text{Silt} \geq 70\% \quad [4]$$

For both silt groups,

$$PLEXW_m = 10.79 + 0.05004 \times Silt \quad \text{Sand} < 75\% \quad [5]$$

For all soil textures,

$$DUL_m = LOL_m + PLEXW_m \quad [6]$$

Approximating the Influence of Bulk Density, Organic Matter and Rock Fragments on Extractable Soil Water Limits. The field measured limits of extractable soil water reported in this study did not contain samples with large variations in bulk density or organic matter because of the requirement that the samples have adequate root density to remove soil water to the LOL and because the near surface measurements of water content were often lower than LOL because of soil evaporation.

For most deep soils in the study, the water extracted by roots of annual crops decreased at depths greater than about 1.3 m, indicating a lack of complete extraction. However, because some roots reach deeper soil, some water is extracted from there. Thus, the LOL water content for those depths must be estimated in order to calculate PLEXW for use in soil water balance evaluations.

Many soils have relatively high bulk densities within part of the profile which often limits the ability of roots to penetrate uniformly throughout the soil volume. To

approximate how bulk density affects the limits of extractable soil water, several literature sources were found that were derived from a large number of pedons where bulk density was measured. Jones (1983) evaluated several published studies related to how soil density affected rooting, and found that soil texture had a significant influence when distinguishing between densities that influenced root growth environments. Soil with higher than a threshold density of a particular texture was penetrated with varying degrees of difficulty.

Rawls et al. (1983) used 2721 samples from various horizons for density and developed a bulk density contour map based on percentages of sand and clay. The measured density data, for the -0.33 bar water content, were adjusted for organic matter using a published formula so that the results were for mineral soil bulk density.

Consider a population of mineral soils of any specific texture combination to have a mean mineral bulk density (D_m) such that DUL, LOL and PLEXW are constant. Further, soils with densities higher than D_m have lower than average PLEXW and higher than average DUL and LOL. Likewise, those with densities lower than D_m will have higher PLEXW and lower DUL and LOL.

Information from literature sources and from this study were used to develop empirical equations to approximate D_m for mineral soils with less than 8 percent organic matter (OM). Bulk densities measured from field samples (D_f) were converted to mineral bulk density (D_{mf}) for this evaluation using the equation

$$D_{mf} = (100 \times D_f - OM \times 0.224)/(100 - OM) \qquad [7]$$

For this evaluation we assume an organic matter density of 0.224 g/cm^3. Further, the average bulk density of soil containing organic matter is assumed to be the mean of the mineral bulk density and organic matter density when weighted with the fraction of each part of the mixture. For best accuracy in estimating D_m from soil texture, the textural ranges were identified that needed separate equations as follows:

$$D_m = 1.709 - 0.01134 \times Clay \qquad Sand > 80\% \qquad [8]$$

$$D_m = 1.118 + 0.00816 \times Sand + Clay \times [0.008340-0.3606/(100-Sand)] \qquad 20\% \leq Sand \leq 80\% \qquad [9]$$

$$D_m = 1.453 - 0.004330 \times Sand \qquad Sand < 20\% \qquad [10]$$

As mentioned earlier, values of DUL, LOL and PLEXW at any given texture should vary with changes in bulk density. Information from the literature was also sought to approximate those relationships.

Voorhees et al. (1975) and Asady et al. (1985) reported data from compaction studies where the soil density for the same soil texture varied considerably. In each case, soil cores were brought into an equilibrium water potential in the -0.1 to -1.0 bar range. In both studies, the water content at pressure potentials near DUL indicated that there was an increase in the water content of approximately 17 volume percent per unit density change (g/cm^3).

How?

Further, assuming that organic matter (OM) increases the DUL by 0.23 volume percent for each one percent of OM, the following equation is used to modify the DUL_m value as calculated in equation 6:

$$DUL_c = DUL_m - 17. \times (D_m - D_f) + 0.23 \times OM_f \quad [11]$$

where D_f is the measured -0.33 bar water content bulk density, OM_f is the measured OM and DUL_c is the estimated DUL when corrected for OM and density.

No suitable laboratory measured data were available to determine the change in PLEWX for soils with unusually high or low densities or with contrasting OM contents. The following equation was used to approximate how density and OM influence PLEXW:

$$PLEXW_c = PLEXW_m + 3.5 \times (D_m - D_f) + 0.55 \times OM_f \quad [12]$$

LOL_c follows as

$$LOL_c = DUL_c - PLEXW_c \quad [13]$$

If measured D_f values are not available for use in equations 11 and 12, default values can be approximated by the equation:

$$D_f \text{ (default)} = [OM \times 0.224 + (100\text{-}OM) \times D_m]/100 \quad [14]$$

If rock fragments (particles greater than 2 mm diameter) are a significant quantity in soil, there should be a correction made in the estimation of extractable soil water. The rock fragments are usually reported as a weight percentage (RFW). Assuming the density of rock fragments to be 2.65 g/cm^3, the following equation converts weight percent to volume percent (RFV):

$$RFV = 1/[1 + 2.65 \times (100 - RFW/RFW \times D_f)] \quad [15]$$

The soil volume percentage (SV) excluding rock fragments is

$$SV = 100 - RFV \quad [16]$$

Assuming the rock fragments hold negligeable water for plant use, the corrected soil water extraction limits are:

$$LOL_e - LOL_c \times SV/100 \quad [17]$$

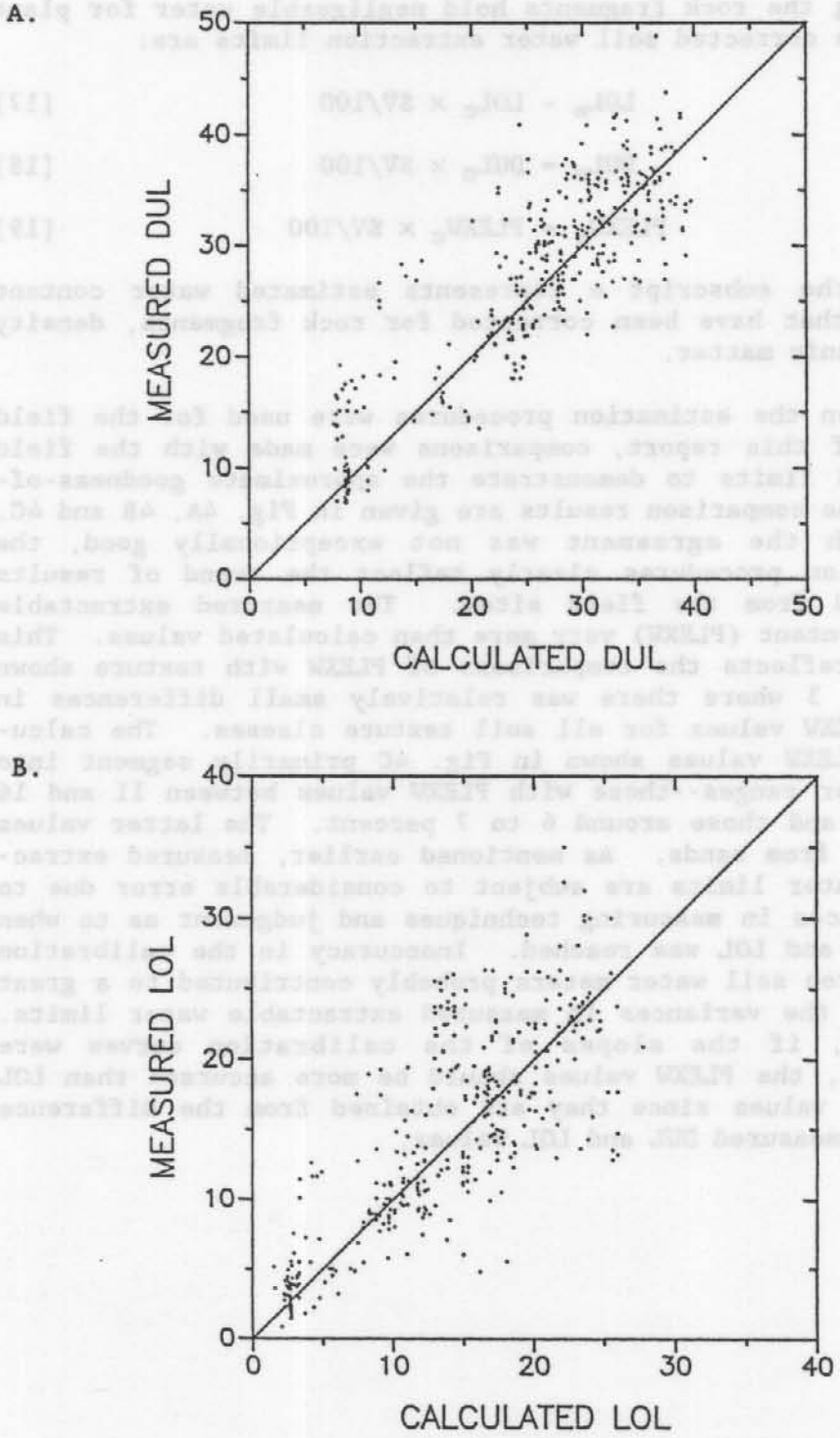
$$DUL_e = DUL_c \times SV/100 \quad [18]$$

$$PLEXW_e = PLEXW_c \times SV/100 \quad [19]$$

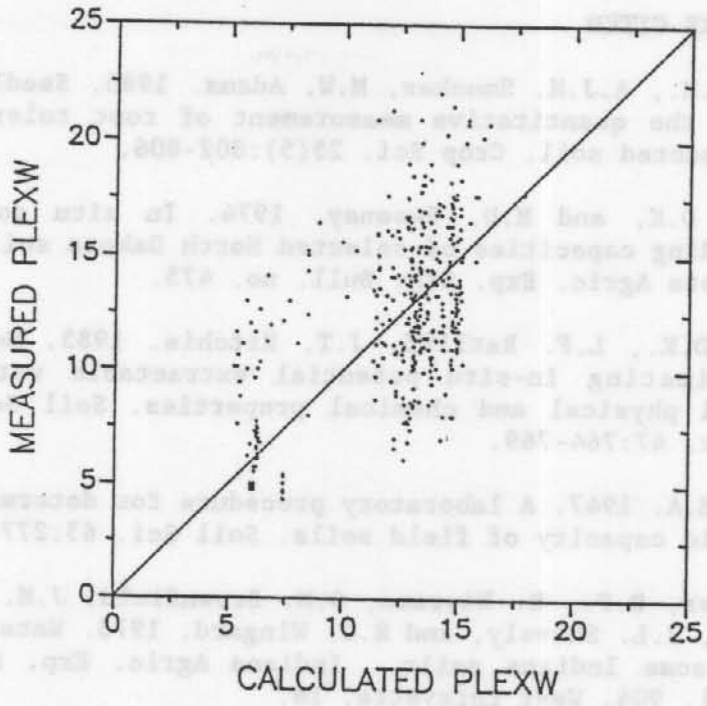
where the subscript e represents estimated water content limits that have been corrected for rock fragments, density and organic matter.

When the estimation procedures were used for the field soils of this report, comparisons were made with the field measured limits to demonstrate the approximate goodness-of-fit. The comparison results are given in Fig. 4A, 4B and 4C. Although the agreement was not exceptionally good, the estimation procedures clearly reflect the trend of results obtained from the field sites. The measured extractable water content (PLEXW) vary more than calculated values. This result reflects the comparisons of PLEXW with texture shown in Fig. 3 where there was relatively small differences in mean PLEXW values for all soil texture classes. The calculated PLEXW values shown in Fig. 4C primarily segment into two major ranges--those with PLEXW values between 11 and 16 percent and those around 6 to 7 percent. The latter values are all from sands. As mentioned earlier, measured extractable water limits are subject to considerable error due to differences in measuring techniques and judgement as to when the DUL and LOL was reached. Inaccuracy in the calibration of neutron soil water meters probably contributed to a great deal of the variances in measured extractable water limits. However, if the slopes of the calibration curves were accurate, the PLEXW values should be more accurate than LOL and DUL values since they are obtained from the difference between measured DUL and LOL values.

Fig. 4. Comparisons of the calculated versus measured values of the limits of water availability for the soils in this study are: A. Drained upper limit (DUL), B. Lower limit (LOL), and C. Plant extractable soil water (PLEXW).



c.



CONCLUSION

The equations to approximate extractable soil water limits expressed in the last section of this paper, are not meant to replace measuring the limits in the field. If it is important to model the water contents of a particular field accurately, measurements in the field are necessary. Based on the results of our study, however, the equations provide as reliable an estimate of the extractable water limits as could be obtained from laboratory measurements. Another possibility for selecting the limits of extractable soil water would be to find the soil in the appendix which most closely resembles the properties of the soils of interest.

This work suggests that soil texture has little influence on PLEXW, except for sands, so that the major factor that varies over many soils of various textures is the value of DUL and LOL. For deep soils and annual crops, the LOL is seldom reached below about 1.3 m apparently because of lack of sufficient uniform rooting below that depth. The results from this study demonstrated that this deep withdrawal characteristic was quite uniform across several contrasting soils, and that practically no water is removed by either upward flow to roots or by root withdrawal below about 2.1 m, at least for annual crops.

LITERATURE CITED

Asady, G.H., A.J.M. Smucker, M.W. Adams. 1985. Seedling test for the quantitative measurement of root tolerances to compacted soil. Crop Sci. 25(5):802-806.

Cassel, D.K. and M.D. Sweeney. 1974. In situ soil water holding capacities of selected North Dakota soils. North Dakota Agric. Exp. Stn. Bull. no. 475.

Cassel, D.K., L.F. Ratliff, J.T. Ritchie. 1983. Models for estimating in-situ potential extractable water using soil physical and chemical properties. Soil Sci. Amer. Proc. 47:764-769.

Colman, E.A. 1947. A laboratory procedure for determining the field capacity of field soils. Soil Sci. 63:277-283.

Franzmeier, D.P., D. Wiersma, S.H. Brownfield, J.M. Robbins, Jr., J.L. Shively, and R.C. Wingard. 1973. Water regimes of some Indiana soils. Indiana Agric. Exp. Stn. Res. Bull. 904. West Lafayette, IN.

Gardner, W.R. 1966. Soil water movement and root absorption. pp. 127-149 In: W.H. Pierre, D. Kirkham, J. Pesek, and R. Shaw (eds.) Plant environment and efficient water use. Am. Soc. Agron. Madison, WI.

Gile, Leland H. 1979. Holocene soils in eolian sediments of Bailey County, Texas. Soil Sci. Soc. Am. J. 43:994-1003.

Gile, Leland H. 1981. Soils and stratigraphy of dunes along a segment of Farm Road 1731, Bailey County, Texas. ICASALS Publication No. 81-2. International Center for Arid and Semi-Arid Land Studies. Texas Tech University, Lubbock, Texas. 78p.

Gupta, S.C. and W.E. Larson. 1979. Estimating soil water retention characteristics from particle size distribution, organic matter percent, and bulk density. Water Resources Res. 15:1633-1635.

Hanson, C.T. and R.L. Blevins. 1979. Soil water in coarse fragments. Soil Sci. Soc. Amer. J. 43:819-820.

Hollis, J.M., R.J.A. Jones, and R.C. Palmer. 1977. The effects of organic matter and particle size of the water-retention properties of some soils in the west midlands of England. Geoderma 17:225-238.

Jamison, V.C. and E.M. Kroth. 1958. Available moisture storage capacity in relation to textural composition and organic matter content of several Missouri soils. Soil Sci. Soc. Amer. Proc. 22:189-192.

Jones, C.A. 1983. Effect of soil texture on critical bulk densities for root growth. Soil Sci. Soc. Am. J. 47:1208-1211.

Linden, D.R. 1982. Predicting tillage effects on evaporation from the soil. ASA Special Publication "Predicting Tillage Effects on Soil Physical Properties and Processes." Am. Soc. Agron. Madison, WI. pp. 117-132.

Oosterweld, M. and C. Chang. 1980. Empirical relations between laboratory determinations of soil texture and moisture retention. Can. Agric. Eng. 21:149-151.

Petersen, G.W., R.L. Cunningham, and R.P. Matelski. 1968a. Moisture characteristics of Pennsylvania soils: I. Moisture retention as related to texture. Soil Sci. Soc. Amer. Proc. 32:271-275.

Petersen, G.W., R.L. Cunningham, and R.P. Matelski. 1968b. Moisture characteristics of Pennsylvania soils: II. Soil factors affecting moisture retention within a textural class-silt loam. Soil Sci. Soc. Amer. Proc. 32:866-870.

Ratliff, L.F., J.T. Ritchie, and D.K. Cassel. 1983. Field-measured limits of soil water availability as related to laboratory-measured properties. Soil Sci. Soc. Amer. Proc. 47:770-775.

Rawls, Walter J. 1983. Estimating soil bulk density from particle size analysis and organic matter content. Soil Sci. 135:123-125.

Richards, L.A. 1960. Advances in soil physics. Trans. Intern. Congress Soil Sci. 7th Congress, Madison 1:67-69.

Richards, L.A. and L.R. Weaver. 1943. Fifteen atmosphere percentages as related to the permanent wilting percentage. Soil Sci. 56:331-339.

Ritchie, J.T. 1981. Soil water availability. Plant and Soil 58:327-338.

Rivers, E.D. and R.F. Shipp. 1972. Available water capacity of sandy and gravelly North Dakota soils. Soil Sci. 113:74-80.

Salter, P.J. and J.B. Williams. 1965. The influence of texture on the moisture characteristics of soils. II. Available water capacity and moisture releases characteristics. J. Soil Sci. 16:310-317.

U.S. Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962.]

U.S. Department of Agriculture. 1972. Soil survey laboratory methods and procedures for collecting soil samples. Soil Survey Investigations Report No. 1. Washington, D.C. Revised 1984.

U.S. Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Ser., U.S. Dep. Agric. Handb. 436. 754 pp.

Voorhees, W.B., D.A. Farrell, W.E. Larson. 1975. Soil strength and aeration effects on root elongation. Soil Sci. Soc. Am. J. 39(5):948-953.

Williams, J.R., D.T. Dyke, and C.A. Jones. 1983. EPIC--A model for assessing the effects of erosion on soil productivity. Proc. Third Internl. Conf. on State-of-the-Art in Ecological Modeling. May 24-28, 1982. Colorado State Univ.

APPENDIX A

Soil Data[5]

[5]The Symbol "LL" on the Graphs is for the Field-Measured Lower Limit and the Term "Extractable" is for the Potential Extractable Soil Water.

SOIL SERIES INDEX

SOIL SERIES INDEX - Continued

GEOGRAPHICAL INDEX

CLASSIFICATION INDEX

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL CLASSIFICATION-

SERIES - - - - - - -

SOIL NO - - - - - - COUNTY - - -

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS.

DEPTH	HORIZON	(- - - - - - - - - - - - - - - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - - - - - - - - -)																RATIO
					FINE (- - - - - SAND - - - - -)						(- - -SILT- - -)					INTR	FINE	NON-	8D1
		SAND	SILT	CLAY	CLAY	VCOS	CORS	MEDS	FNES	VFNS	COSI	FNSI	VFSI	SAND	II	CLAY	CO3-	15-
		2-	.05-	LT	LT	2-	1-	.5-	.25-	.10-	.05	.02	.005-	2-	.2-	TO	CLAY	BAR
		.05	.002	.002	.0002	1	.5	.25	.10	.05	.02	.002	.002	.10	.02	CLAY		TO
CM		(- PCT LT 2MM -)														PCT	PCT	CLAY
COLUMN 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)					(BULK DENSITY)			(- - - -WATER CONTENT- - - -)				CARBONATE		(- -PH - -)	
	VOL.	(- - - - - - - WEIGHT - - - - - - -)				4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1	6E1B	3A1A	8C1A	8C1E
	GT		75-20	20-5	5-2	LT	20-2	1/3-	OVEN	COLE	1/10	1/3-	15-	WRD	LT	LT	1/1	1/2
	2	GT 75				.074	PCT	BAR	DRY		BAR	BAR	BAR	CM/	2	.002	H2O	CACL
CM	PCT	PCT	(- - - PCT LT 75 - - -)			LT20	G/CC	G/CC			PCT	PCT	PCT	CM	PCT	PCT		
COLUMN 1	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38

DEPTH	(ORGANIC MATTER)			IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A	6B1A	C/N	6C2B		6N2E	6O2D	6P2B	6Q2B		6H1A	6G1E	5A3A	5A6A	8D1	8D3	5P1	5C3	5C1
	ORGN	NITG		EXT	TOTL	CA	MG	NA	K	SUM	BACL	KCL	EXTB	NHAC	NHAC	CA	SAT	EXTB	NHAC
	CARB			FE						EXTB	TEA	EXT	ACTY		TO	TO	NHAC	ACTY	
CM	PCT	PCT		PCT	PCT	(- - - - - - - - - - - -MEQ / 100 G- - - - - - - - - - -)									CLAY	MG	PCT	PCT	
COLUMN 1	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57

DEPTH	(SATURATED PASTE)			NA	NA	SALT	GIP	(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -)								ATTERBERG		
	8E1	8C1B	8A	5D2	5E	8D5	6F1A	8A1A	6N1B	6O1B	6P1B	6Q1B	6I1A	6J1A	6K1A	6L1A	6H1A	4F1	4F2
	REST	PH	H2O	ESP	SAR	TOTL		EC	CA	MG	NA	K	CO3	HCO3	CL	SO4	NO3	LQID	PLST
	OHM-					SOLU		MMHOS/										LMIT	INDX
CM	CM		PCT	PCT		PPM	PCT	CM	(- - - - - - - - - - MEQ / LITER - - - - - - - - - - -)									PCT	
COLUMN 1	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76

REMARKS: EXAMPLE COMPUTER PRINTOUT FOR DATA REPORTED PRIOR TO 1978. COLUMN NUMBERS REFER TO MORE COMPLETE COLUMN HEADINGS ON ADJOINING PAGES.

```
SOIL

CLASSIFICATION

SOIL NO.                        SAMPLE NOS.                       DATE                 U. S. DEPARTMENT OF AGRICULTURE
                                                                                       SOIL CONSERVATION SERVICE
PROJECT                                                                                NATIONAL SOIL SURVEY LABORATORY
                                                                                       LINCOLN, NEBRASKA
GENERAL METHODS   1B1A, 2A1, 2B

        -1--  -2--  -3--  -4--  -5--  -6--  -7--  -8--  -9--  -10-  -11-  -12-  -13-  -14-  -15-  -16-  -17-  -18-  -19-  -20-

------  ----------------------------------------------------------------------------------------------------------------------
                              (- - -TOTAL - - -)(- -CLAY- -)(- -SILT- -)(- - - -  - -SAND- -  - - - -)(-COARSE FRACTIONS(MM)-)(>2MM)
                              CLAY  SILT  SAND  FINE   CO3  FINE COARSE  VF     F     M     C    VC   - - - - WEIGHT - - - -   WT
SAMPLE HZN  DEPTH   HORIZON    LT   .002  .05    LT    LT   .002  .02   .05   .10   .25   .5    1     2     5    20    .1-  PCT OF
 NO.   NO.  (CM)              .002  -.05   -2  .0002  .002  -.02  -.05  -.10  -.25  -.50   -1   -2    -5   -20   -75   75  WHOLE
                              <- - - - - - - - - - - - - PCT OF <2MM  (3A1) - - - - - - - - - - - - ->  <- PCT OF <75MM(3B1)->  SOIL

COLUMN
 77     78   79       80        81    82    83    84    85    86    87    88    89    90    91    92    93    94    95    96    97

------  ----------------------------------------------------------------------------------------------------------------------
            ORGN TOTAL  EXTR TOTAL (- - DITH-CIT - -)(RATIO/CLAY)(ATTERBERG )(- BULK DENSITY -) COLE (- - -WATER CONTENT - -)  WRD
              C    N     P     S        EXTRACTABLE          15   - LIMITS -  FIELD  1/3  OVEN WHOLE  2-    0.06   1/3    15  WHOLE
SAMPLE HZN                            FE    AL    MN    CEC  BAR    LL    PI  MOIST  BAR  DRY   SOIL  BAR    BAR   BAR   BAR  SOIL
 NO.   NO. 6A1C  6B3A        6R3A  6C2B  6G7A  6D2A  8D1   8D1   4F1   4F   4A3A  4A1D  4A1H  4D1   4B1A   4B1C  4B1C  4B2A  4C1
           <- - - - - - -PCT OF <2MM - - - - - - - ->         PCT <0.4MM  <- - G/CC - - -> CM/CM  <- - -PCT OF <2MM - -> CM/CM

COLUMN
 77     78   98   99   100   101   102   103   104   105   106   107   108   109   110   111   112   113   114   115   116   117

------  ----------------------------------------------------------------------------------------------------------------------
           (- NH4OAC EXTRACTABLE BASES -) ACID-      (- -CEC-  -) EXCH   SAR    BASE      CARBONATE    CASO4 AS  (- - - -PH - - -)
              CA    MG    NA    K    SUM   ITY        SUM   NH4-   NA          SATURATION  AS CACO3     GYPSUM    SAT  CACL2  H2O
SAMPLE HZN 5B5A  5B5A  5B5A  5B5A BASES                CATS   OAC                SUM NH4OAC <2MM <20MM  <2MM <20MM PASTE  .01M
 NO.   NO. 6N2E  6O2D  6P2B  6Q2B             6H5A    5A3A  5A8B   5D2     5E    5C3   5C1  6E1G  8E1   6F1A  6F4  8C1B  8C1F  8C1F
           <- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->  PCT       <- -PCT- > <- -PCT -> <- -PCT ->          1:2   1:1

COLUMN
 77     78  118   119   120   121   122   123          125   126   141    142    143   144   145   146  147   148   149   150   151

------  ----------------------------------------------------------------------------------------------------------------------
        (- - - - - - - -WATER EXTRACTED FROM SATURATED PASTE- - - - - - - - - - -)(- - - - - - - - -MINERALOGY - - - )  TOT ANL 7C3
                                                                      TOTAL ELEC. (- - - - - - - - CLAY - - - - - - - -)     CLAY
              CA    MG    NA    K    CO3  HCO3   CL    SO4   NO3  H2O  SALTS COND. (- - - -  X-RAY - - - -)(- -DTA - -)
SAMPLE HZN                                                            EST.  8A3A                                         K2O    Fe
 NO.   NO. 6N1B  6O1B  6P1B  6Q1B  6I1B  6J1B  6K1C  6L1C  6M1C  8A   8D5  MMHOS  7A2I  7A2I  7A2I  7A2I  7A3   7A3   6Q3A  6C7A
           <- - - - - - - - - - - -MEQ / LITER - - - - - - - - - ->  <- -PCT ->  /CM   <- RELATIVE AMOUNTS ->  <- - - - -PCT - - - ->

COLUMN
 77     78  152   153   154   155   156   157   158   159   160   161   162   163   137   137   137   137   138   138   139   140

------  ----------------------------------------------------------------------------------------------------------------------

        ESTIMATED BULK DENSITY FOR LAYER    6

        MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS  1,  2,

        ANALYSES:  S= ALL ON SIEVED <2MM BASIS

        MINERALOGY:  KIND OF MINERAL  FK POTAS-FELD    MT MONTMORILL    KK KAOLINITE       MI MICA           QZ QUARTZ

                        RELATIVE AMOUNT     6 INDETERMINATE   5 DOMINANT   4 ABUNDANT   3 MODERATE   2 SMALL   1 TRACE
```

REMARKS: EXAMPLE COMPUTER PRINTOUT FOR DATA REPORTED SINCE 1977 AND FOR SOILS THAT ARE GENERALLY ALKALINE OR CONTAIN SOLUBLE SALTS. COLUMN NUMBERS REFER TO MORE COMPLETE COLUMN HEADINGS ON ADJOINING PAGES.

```
SOIL

CLASSIFICATION

SOIL NO.                                 SAMPLE NOS.                      DATE                 U. S. DEPARTMENT OF AGRICULTURE
                                                                                               SOIL CONSERVATION SERVICE
PROJECT                                                                                        NATIONAL SOIL SURVEY LABORATORY
                                                                                               LINCOLN, NEBRASKA
GENERAL METHODS   1B1A, 2A1, 2B

        -1--  -2--  -3--  -4--  -5--  -6--  -7--  -8--  -9--  -10-  -11-  -12-  -13-  -14-  -15-  -16-  -17-  -18-  -19-  -20-
------ -----------------------------------------------------------------------------------------------------------------------
                                (- - -TOTAL - - -)(- -CLAY- -)(- -SILT- -)(- - - - -SAND- - - - - -)(-COARSE FRACTIONS(MM)-)(>2MM)
                                CLAY  SILT  SAND  FINE   CO3  FINE COARSE  VF     F     M     C    VC   - - - - WEIGHT - - - -   WT
SAMPLE HZN  DEPTH    HORIZON     LT   .002  .05    LT    LT   .002  .02   .05   .10   .25    .5    1     2     5    20    .1-  PCT OF
NO.    NO.  (CM)                .002  -.05   -2  .0002  .002  -.02  -.05  -.10  -.25  -.50   -1   -2    -5   -20   -75    75  WHOLE
                                <- - - - - - - - - - - - - PCT OF <2MM  (3A1) - - - - - - - - - - - ->  <- PCT OF <75MM(3B1)->  SOIL

COLUMN
77     78    79        80        81    82    83    84     85    86    87    88    89    90    91    92    93    94    95    96    97

------ -----------------------------------------------------------------------------------------------------------------------
            ORGN TOTAL  EXTR TOTAL (- - DITH-CIT - -)(RATIO/CLAY)(ATTERBERG )(- BULK DENSITY -) COLE (- - -WATER CONTENT - -) WRD
             C     N     P     S      EXTRACTABLE       15    - LIMITS -  FIELD  1/3  OVEN WHOLE  2-    0.06   1/3   15  WHOLE
SAMPLE HZN                           FE    AL    MN    CEC   BAR   LL    PI  MOIST  BAR   DRY  SOIL  BAR   BAR   BAR   BAR  SOIL
NO.    NO. 6A1C  6B3A          6R3A  6C2B  6G7A  6D2A  8D1   8D1   4F1   4F  4A3A  4A1D  4A1H  4D1  4B1A  4B1C  4B1C  4B2A  4C1
           <- - - - - - -PCT OF <2MM - - - - - - - ->          PCT <0.4MM <- - G/CC - - -> CM/CM <- - -PCT OF <2MM - -> CM/CM

COLUMN
77     78   98    99    100   101   102   103   104   105   106  107   108   109   110   111   112   113   114   115   116   117

------ -----------------------------------------------------------------------------------------------------------------------
       (- NH4OAC EXTRACTABLE BASES -) ACID- EXTR (- - - -CEC - - -)  AL   -BASE SAT- CO3 AS RES.     COND. (- - - -PH - - -)
          CA    MG    NA     K   SUM   ITY   AL   SUM  NH4-  BASES  SAT   SUM  NH4  CACO3 OHMS     MMHOS   KCL  CACL2  H2O
SAMPLE HZN 5B5A 5B5A  5B5A  5B5A BASES              CATS  OAC  + AL              OAC  <2MM  /CM      /CM    IN   .01M
NO.    NO. 6N2E 6O2D  6P2B  6Q2B       6H5A  6G9A  5A3A  5A8B  5A3B   5G1   5C3   5C1  6E1G  8E1       8I   8C1G  8C1F  8C1F
           <- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - - ->  <- - - - -PCT - - - ->                   1:2   1:1

COLUMN
77     78   118   119   120   121   122   123   124   125   126  127   128   129   130   131   132     133   134   135   136

------ -----------------------------------------------------------------------------------------------------------------------
                                                                 (- - - - - - - - -MINERALOGY - - - ) TOT ANL 7C3
                                                                 (- - - - - - - - CLAY  - - - - - - -)    CLAY
SAMPLE HZN                                                       (- - - -  X-RAY - - - -)(- -DTA - -)
NO.    NO.                                                       (- - - - -  <2U - - - -)(- -<2U - -) K20    Fe
                                                                 7A21  7A21  7A21  7A21  7A3   7A3   6Q3A  6C7A
                                                                 <- RELATIVE AMOUNTS ->  <- - - - -PCT - - - ->

COLUMN
77     78                                                        137   137   137   137   138   138   139   140

------ -----------------------------------------------------------------------------------------------------------------------

FAMILY CONTROL SECTION:  DEPTH                       PCT CLAY      PCT .1-75MM

ESTIMATED BULK DENSITY FOR LAYER

ANALYSES:  S= ALL ON SIEVED <2MM BASIS

MINERALOGY:  KIND OF MINERAL  KK KAOLINITE    VR VERMICULITE   GI GIBBSITE      GE GOETHITE      PR PYROXENE

                                EP EPIDOTE

                RELATIVE AMOUNT    6 INDETERMINATE   5 DOMINANT   4 ABUNDANT   3 MODERATE   2 SMALL   1 TRACE
```

REMARKS: EXAMPLE COMPUTER PRINTOUT FOR DATA REPORTED SINCE 1977 AND FOR SOILS THAT ARE GENERALLY ACID OR LOW IN SOLUBLE SALTS. COLUMN NUMBERS REFER TO MORE COMPLETE COLUMN HEADINGS ON ADJOINING PAGES.

COLUMN HEADINGS FOR COMPUTER PRINTED DATA SHEETS

COLUMN	
1	Depth in centimeters
2	Horizon
	Columns 3 through 16 display numbers which are percents of the total weight of particles 2 millimeters or less in size.
3	Total sand (particles range from .05 to 2 millimeters)
4	Total silt (particles range from .002 to .05 millimeter)
5	Total clay (particles are smaller than .002 millimeter)
6	Total fine clay (particles are smaller than .0002 millimeter)
7	Very coarse sand (particles range from 1 to 2 millimeters)
8	Coarse sand (particles range from 0.5 to 1 millimeter)
9	Medium sand (particles range from 0.25 to 0.5 millimeter)
10	Find sand (particles range from 0.1 to 0.25 millimeter)
11	Very fine sand (particles range from .05 to 0.1 millimeter)
12	Coarse silt (particles range from .02 to .05 millimeter)
13	Fine silt (particles range from .002 to .02 millimeter; these limits also define the range of total silt on the International Soil Science Society Scale.)
14	Very fine silt (particles range from .002 to .005 millimeter)
15	Family texture sand (particles range from 0.1 to 2 millimeters)
16	International II (particles range from .02 to 0.2 millimeter; these limits define the range of the fine sand on the International Soil Science Society Scale.)
17	Fine clay to clay (this is the ratio of fine clay to total clay expressed as percent.)
18	Noncarbonate clay (this is the percentage of total clay, column 5, minus the percentage of carbonate clay, column 36.)
19	Ratio of 15-bar water percentage to total clay percentage
20	Volume of material greater than 2 millimeters given as a percent of total (sample volume)
21	Greater than 75 millimeter material given as a percent of total sample weight
22	Particle size range from 20 to 75 millimeters given as a weight percent of all material 75 millimeters or less in the sample
23	Particle size range from 5 to 20 millimeters given as a weight percent of all material 75 millimeters or less in the sample
24	Particle size range from 2 to 5 millimeters given as a weight percent of all material 75 millimeters or less in the sample
25	Particle size range less than 0.74 millimeter given as a weight percent of all material 75 millimeters or less
26	Particle size range from 2 to 20 millimeters given as a weight percent of all material 20 millimeters or less
27	Bulk density of soil desorbed to 1/3-bar given in grams per cubic centimeter
28	Bulk density of oven dry soil given in grams per cubic centimeter
29	Coefficient of linear extensibility
30	Water content of soil desorbed to 1/10-bar given as a percent of oven dry weight
31	Water content of soil desorbed to 1/3-bar given as a percent of oven dry weight
32	Water content of soil desorbed to 15 bars given as a percent of oven dry weight
33	Water retention difference given in centimeter per centimeter
34	Column used for any water content measurement different from those given in columns 30 through 33
35	Carbonate content of the material 2 millimeters or less given as a percent
36	Carbonate content of the material .002 millimeter or less given as a percent
37	pH of a 1:1 suspension of soil in distilled water
38	pH of a 1:2 suspension of soil in .01 molar calcium chloride
39	Organic carbon given as a percent
40	Nitrogen given as a percent
41	Organic carbon to nitrogen ratio
42	Extractable iron given as a percent
43	Total phosphorus given as a percent
44	Extractable calcium given in milliequivalents per 100 grams of soil
45	Extractable magnesium given in milliequivalents per 100 grams of soil
46	Extractable sodium given in milliequivalents per 100 grams of soil
47	Extractable potassium given in milliequivalents per 100 grams of soil
48	Sum of the extractable bases given in milliequivalents per 100 grams of soil
49	Acidity - barium chloride with triethanolamine measurement - given in milliequivalents per 100 grams of soil
50	Aluminum - potassium chloride extraction - given in milliequivalents per 100 grams of soil
51	Cation exchange capacity by sum of the extractable bases plus the acidity given in milliequivalents per 100 grams of soil
52	Cation exchange capacity as measured by ammonium acetate given in milliequivalents per 100 grams of soil
53	Ratio of ammonium acetate cation exchange capacity to total clay
54	Ratio of extractable calcium to extractable magnesium
55	Calcium saturation of the ammonium acetate cation exchange capacity given as a percent
56	Base saturation - sum of the extractable bases divided by the acidity plus the sum of the extractable bases - given as a percent

COLUMN HEADINGS FOR COMPUTER PRINTED DATA SHEETS--Continued

COLUMN	
57	Base saturation - sum of the extractable bases divided by the ammonium acetate cation exchange capacity - given as a percent
58	Saturated paste (soil plus water) resistivity given in ohm-cm
59	Saturated paste (soil plus water) pH
60	Saturated paste (soil plus water) water content given as a percent
61	Exchangeable sodium percentage
62	Sodium adsorption ratio
63	Total soluble salt given in parts per million
64	Gypsum given in percent
65	Electrical conductivity of the saturation extract given in mmhos per centimeter
66	Calcium content of the saturation extract given in milliequivalents per liter
67	Magnesium content of the saturation extract given in milliequivalents per liter
68	Sodium content of the saturation extract given in milliequivalents per liter
69	Potassium content of the saturation extract given in milliequivalents per liter
70	Carbonate (CO_3) content of the saturation extract given in milliequivalents per liter
71	Bicarbonate (HCO_3) content of the saturation extract given in milliequivalents per liter
72	Chloride content of the saturation extract given in milliequivalents per liter
73	Sulfate (SO_4) content of the saturation extract given in milliequivalents per liter
74	Nitrate (NO_3) content of the saturation extract given in milliequivalents per liter
75	Liquid limit given as percent water - percentage basis is soil material less than 0.4 millimeter
76	Plastic index
77	Sample number - first two digits on the left are for the year
78	Horizon number
79	Depth in centimeters
80	Horizon
.	Columns 81 through 92 display numbers which are percents of the total weight of particles 2 millimeters or less in size
81	Total clay (particles are smaller than .002 millimeter)
82	Total silt (particles range from .002 to .05 millimeter)
83	Total sand (particles range from .05 to 2 millimeters)
84	Total fine clay (particles are smaller than .0002 millimeter)
85	Carbonate content of the material .002 millimeter or less given as a percent
86	Fine silt (particles range from .002 to .02 millimeter; these limits also define the range of total silt on the International Soil Science Society Scale.)
87	Coarse silt (particles range from .02 to .05 millimeter)
88	Very fine sand (particles range from .05 to 0.1 millimeter)
89	Fine sand (particles range from 0.1 to 0.25 millimeter)
90	Medium sand (particles range from 0.25 to 0.5 millimeter)
91	Coarse sand (particles range from 0.5 to 1 millimeter)
92	Very coarse sand (particles range from 1 to 2 millimeters)
93	Coarse fragments between 2 and 5 millimeters calculated on a < 75-millimeter soil weight basis given as percent
94	Coarse fragments between 5 and 20 millimeters calculated on a < 75-millimeter soil weight basis given as percent
95	Coarse fragments between 20 and 75 millimeters calculated on a < 75-millimeter soil weight basis given as percent
96	Family particle-size range from 0.1 to 75 millimeters calculated on a < 75-millimeter soil weight basis given as percent
97	Rock fragments range from 2 millimeters in diameter or larger and include all sizes that have horizontal dimensions less than the size of the pedon calculated on a whole soil basis and given as percent
98	Organic carbon given as percent
99	Nitrogen given as percent
100	Extractable phosphorous given as percent
101	Total sulfur given as percent
102	Dithionite-citrate extractable iron given as percent
103	Dithionite-citrate extractable aluminum given as percent
104	Dithionite-citrate extractable manganese given as percent
105	Ratio of ammonium acetate cation exchange capacity to total clay
106	Ratio of 15-bar percentage to total clay percentage
107	Liquid limit given as percent water - percentage basis is soil material less than 0.4 millimeter
108	Plastic index
109	Bulk density of soil at field moisture given in grams per cubic centimeter
110	Bulk density of soil desorbed to 1/3-bar given in grams per cubic centimeter
111	Bulk density of oven dry soil given in grams per cubic centimeter
112	Coefficient of linear extensibility
113	Water content of soil desorbed to 2 bars given as a percent of oven dry weight
114	Water content of soil desorbed to 0.06-bar given as a percent of oven dry weight
115	Water content of soil desorbed to 1/3-bar given as a percent of oven dry weight
116	Water content of soil desorbed to 15 bars given as a percent of oven dry weight

COLUMN HEADINGS FOR COMPUTER PRINTED DATA SHEETS--Continued

COLUMN	
117	Water retention difference given in centimeter per centimeter
118	Extractable calcium given in milliequivalents per 100 grams of soil
119	Extractable magnesium given in milliequivalents per 100 grams of soil
120	Extractable sodium given in milliequivalents per 100 grams of soil
121	Extractable potassium given in milliequivalents per 100 grams of soil
122	Sum of the extractable bases given in milliequivalents per 100 grams of soil
123	Acidity - barium chloride with triethanolamine measurement - given in milliequivalents per 100 grams of soil
124	Aluminum - potassium chloride extraction - given in milliequivalents per 100 grams of soil
125	Cation exchange capacity by sum of the extractable bases plus the acidity given in milliequivalents per 100 grams of soil
126	Cation exchange capacity as measured by ammonium acetate given in milliequivalents per 100 grams of soil
127	Cation exchange capacity by sum of the extractable bases plus extractable aluminum given in milli-equivalents per 100 grams of soil
128	Aluminum saturation for the sum of extractable bases plus aluminum given as percent
129	Base saturation - sum of the extractable bases divided by the acidity plus the sum of the extractable bases - given as a percent
130	Base saturation - sum of the extractable bases divided by the ammonium acetate cation exchange capacity - given as a percent
131	Carbonate as calcium carbonate equivalent of the < 2-millimeter soil given as a percent
132	Resistivity of saturated paste (soil plus water) given in ohm-cm
133	Electrical conductivity of 1:2 soil - water extract given in mmhos per centimeter
134	pH of a 1:1 suspension of soil in 1 normal potassium chloride
135	pH of a 1:2 suspension of soil in 0.01 molar calcium chloride
136	pH of a 1:1 suspension of soil in distilled water
137	Clay minerals identified by X-ray diffraction and given as relative amounts
138	Clay minerals identified by differential thermal analysis and given as a percent
139	Total potassium oxide in the clay given as a percent of the total clay
140	Total iron in the clay given as a percent of the total clay
141	Exchangeable sodium percentage
142	Sodium adsorption ratio
143	Base saturation - sum of the extractable bases divided by the acidity plus the sum of the extractable bases - given as a percent
144	Base saturation - sum of the extractable bases divided by the ammonium acetate cation exchange capacity - given as a percent
145	Carbonate as calcium carbonate equivalent of the < 2-millimeter soil given as a percent
146	Carbonate as calcium carbonate equivalent of the < 20-millimeter soil given as a percent
147	Calcium sulfate as gypsum for the < 2-millimeter soil given as a percent
148	Calcium sulfate as gypsum for the < 20-millimeter soil given as a percent
149	pH of saturate paste (soil plus water)
150	pH of a 1:2 suspension of soil in 0.01 molar calcium chloride
151	pH of a 1:1 suspension of soil in distilled water
152	Calcium content of the saturation extract given in milliequivalents per liter
153	Magnesium content of the saturation extract given in milliequivalents per liter
154	Sodium content of the saturation extract given in milliequivalents per liter
155	Potassium content of the saturation extract given in milliequivalents per liter
156	Carbonate (CO_3) content of the saturation extract given in milliequivalents per liter
157	Bicarbonate (HCO_3) content of the saturation extract given in milliequivalents per liter
158	Chloride content of the saturation extract given in milliequivalents per liter
159	Sulfate (SO_4) content of the saturation extract given in milliequivalents per liter
160	Nitrate (NO_3) content of the saturation extract given in milliequivalents per liter
161	Water content of saturated paste based on oven dry soil weight given as percent
162	Total soluble salt given as percent
163	Electrical conductivity of the saturation extract given in mmhos per centimeter

ACUFF

CLASSIFICATION: FINE-LOAMY, MIXED, THERMIC ARIDIC PALEUSTOLL

S 80TX-303 -002 SAMPLE NOS. 81P 6 - 13 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS (MM) WEIGHT 2 -5	5 -20	20 -75	.1- 75 PCT OF <75MM(3B1)	(>2MM) WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)																
81 6	1S	0- 15	AP	18.1	21.2	60.7			7.8	13.4	22.0	30.1	8.2	0.3	0.1	--	--	--	39	--
81 7	2S	15- 33	A12	18.9	20.7	60.4			7.8	12.9	21.9	30.5	7.8	0.1	0.1	TR	--	--	38	--
81 8	3S	33- 61	B21T	30.7	21.9	47.4			8.7	13.2	17.0	23.6	6.7	0.1	--	--	--	--	30	--
81 9	4S	61- 86	B22T	30.1	25.3	44.6			10.7	14.6	16.4	21.7	6.4	0.1	--	--	--	--	28	--
81 10	5S	86-119	B23T	27.2	21.1	51.7			9.1	12.0	17.6	25.5	8.2	0.3	0.1	TR	TR	--	34	TR
81 11	6S	119-152	B24TC	26.9	24.7	48.4		10	16.3	8.4	11.8	26.5	9.1	0.6	0.4	3	1	--	39	4
81 12	7S	152-198	B25TC	27.2	32.1	40.7		16	24.4	7.7	10.1	16.8	7.2	3.0	3.6	4	6	--	38	10
81 13	8S	198-267	B26TC	24.9	36.8	38.3		8	22.0	14.8	10.0	18.0	5.5	2.2	2.6	6	2	--	34	8

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	(RATIO/CLAY) CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM									PCT <0.4MM		<- G/CC			CM/CM	<- PCT OF <2MM				CM/CM
81 6	1	0.74	0.067						0.70	0.39				1.40			9.5			7.0	
81 7	2	0.51	0.052						0.65	0.41				1.52	1.64	0.226	10.5	20.4	15.2	7.7	0.11
81 8	3	0.60	0.063						0.60	0.39				1.45	1.68	0.050	16.4	26.2	21.7	12.1	0.14
81 9	4	0.33							0.58	0.40				1.45	1.65	0.044	16.7		19.4	12.0	0.11
81 10	5	0.18							0.59	0.41				1.50	1.66	0.034	15.7		17.9	11.1	0.10
81 11	6	0.12							0.34	0.30				1.40			13.6			8.1	
81 12	7	0.14							0.23	0.28				1.40			15.2			7.7	
81 13	8	0.06							0.40	0.35				1.31	1.37	0.014	14.2		19.9	8.8	0.14

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	CEC SUM CATS 5A3A	NH4-OAC 5A8B	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1A	<20MM 6F4	PH SAT PASTE 8C1B	CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- MEQ / 100 G								PCT		<- PCT ->		PCT		<- PCT ->				
81 6	1	10.4	3.4	0.2	1.5	15.5	2.1	17.6	12.6	1	TR	88	100	TR	1400			7.4	7.2	7.6
81 7	2	9.8	3.3	TR	1.0	14.1	1.1	15.2	12.3			93	100	--					7.2	7.8
81 8	3	14.4	4.0	0.2	0.7	19.3	1.3	20.6	18.5			94	100	--					7.1	7.8
81 9	4	15.7	4.0	0.3	0.7	20.7	1.0	21.7	17.5			95	100	TR					7.4	8.0
81 10	5		4.7	0.3	0.8				16.0	2	1		100	2	2100			7.7	7.7	8.1
81 11	6		3.5	0.4	0.5				9.2	3	2		100	27	2100			7.8	7.8	8.2
81 12	7		3.4	0.3	0.4				6.3	2	2		100	26	1700			7.7	7.9	8.1
81 13	8		5.0	0.2	0.6				9.9	2	1		100	32	1900			7.7	7.9	8.2

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6N1B	MG 6O1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A3A MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DTA <2U 7A3	7A3	FS & VFS TOTAL RES 7B1A	DOM WEATH 7B1A
		<- MEQ / LITER									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->						<- PCT ->	
81 6	1	10.8	4.5	0.5	1.6	--	4.9	2.8	2.5	6.8	33.0	TR	1.72								
81 7	2												0.19								
81 8	3												0.19								
81 9	4												0.23	MT 3	MI 3	KK 2	FD 2	KK21		89	FK 8
81 10	5	2.8	1.1	1.7	0.2	--	1.6	0.5	2.9	0.4	42.2	TR	0.60	MT 3	MI 3	KK 2	QZ 1				
81 11	6	4.5	2.5	3.6	0.2	--	1.5	2.3	4.5	1.5	36.9	TR	1.10								
81 12	7	6.6	4.8	4.6	0.4	--	1.2	7.7	4.9	3.3	34.0	TR	1.71								
81 13	8	4.1	2.8	2.2	0.3	--	1.4	1.0	4.6	1.2	37.6	TR	0.95	MI 3	MI 3	CA 2	KK 2	KK17		79	CA14

ESTIMATED BULK DENSITY FOR LAYER 1, 6, 7,

MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS 2, 3, 4,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE FD FELDSPAR FK POTAS-FELD
QZ QUARTZ CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

TOTAL ANALYSIS 7C3
CLAY

SAMPLE NO.	HZN NO.	K2O 6Q3A	Fe 6C7A
		<- PCT	->
81 9	4	2.5	5.4
81 13	8	2.1	3.9

Series: Acuff.

Pedon Number: S80TX-303-2

Classification: Fine-loamy, mixed, thermic Aridic Paleustolls.

Location: Lubbock County, Texas: 1 mile east on Farm Road 1294 from its intersection with U.S. Highway 87, then 297 meters south and 188 meters west. Site is 1 meter east of the center of Charles Wendt's large rainout shelter on the Texas A&M Agriculture Research Center.

Use and Vegetation: Cropland - presently in cotton - previous crop was grain sorghum.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1000 meters.

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent. Plane surface.

Sampled and Described By: Larry F. Ratliff Date: 9-16-80

Ap - 0 to 15 cm.; reddish brown (5YR4/3) fine sandy loam, dark reddish brown (5YR3/3) moist; weak fine granular structure; very hard, very friable; common fine roots; few pockets of clean sand grains; mildly alkaline; abrupt smooth boundary. (810006).

A12 - 15 to 33 cm.; reddish brown (5YR4/3) fine sandy loam, dark reddish brown (5YR3/3) moist; massive; very hard, firm; few fine roots; few fine pores; mildly alkaline; clean smooth boundary. (810007).

B21t - 33 to 61 cm.; reddish brown (5YR5/3) sandy clay loam, reddish brown (5YR4/3) moist; moderate medium and coarse blocky structure; extremely hard, firm; common fine roots mostly between peds; mildly alkaline; gradual smooth boundary. (810008).

B22t - 61 to 86 cm.; reddish brown (5YR5/4) sandy clay loam, reddish brown (5YR4/4) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots mostly between peds; common fine and medium pores; thick continuous clay films on faces of peds; moderately alkaline; gradual wavy boundary. (810009).

B23t - 86 to 119 cm.; reddish brown (5YR5/4) sandy clay loam, reddish brown (5YR4/4) moist; weak fine and medium subangular blocky structure; very hard, firm; few fine roots; common fine and medium pores; thin patchy clay films on faces of peds; few threads and soft masses of white CaCO3; strong effervescence, moderately alkaline; clear smooth boundary. (810010).

B24tca - 119 to 152 cm.; pink (5YR7/3) light clay loam, reddish yellow (5YR6/6) moist; weak fine subangular blocky structure; hard, friable; very few fine roots; common fine and medium pores; estimated 30 percent by volume of soft masses white CaCO3, few fine concretions; violent effervescence, moderately alkaline; gradual wavy boundary. (810011).

B25tca - 152 to 198 cm.; pink (5YR8/3) light clay loam, reddish yellow (5YR7/6) moist; weak fine subangular blocky structure; hard, friable; common fine and medium pores; estimated 30 percent by volume white CaCO3, about 20 percent concretions up to 5 cm. in diameter; violent effervescence, moderately alkaline; gradual wavy boundary. (810012).

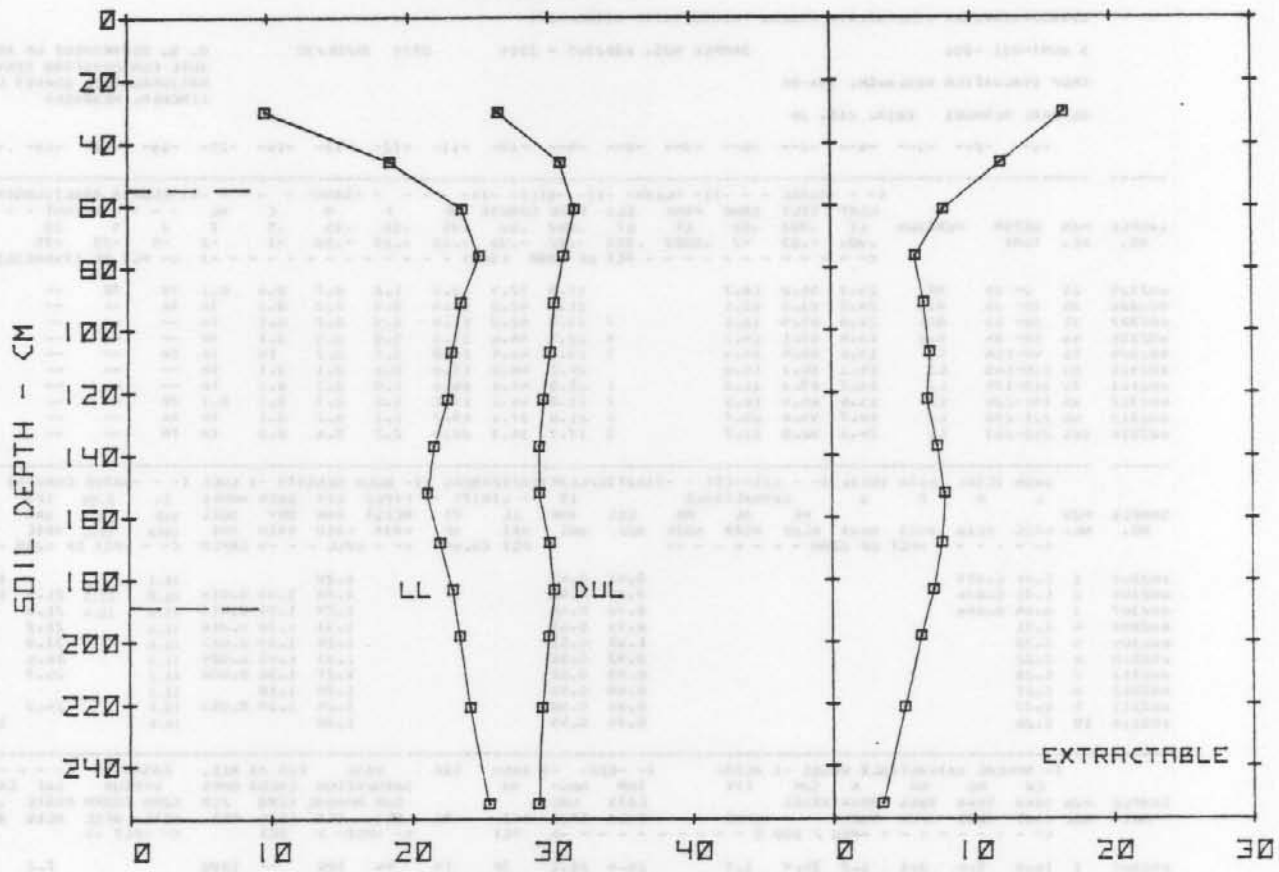
B26tca - 198 to 267 cm.; reddish yellow (5YR7/6) loam, yellowish red (5YR5/6) moist; weak fine and medium subangular blocky structure; very hard, friable; common fine and medium pores; thin patchy clay films on faces of peds; estimated 30 percent by volume of white CaCO3, few fine concretions; violent effervescence, moderately alkaline. (810013).

Remarks: The A12 horizon is a compact, well expressed plowpan. There is very little evidence of clay illuviation in the B23tca and B24tca horizons.

Field Measured Soil Water Data Contributed By: Charles W. Wendt, Texas A&M Agriculture Research and Extension Center, Lubbock, Texas.

Pedon Number: S80TX-303-2

FIELD MEASURED SOIL WATER LIMITS



ACUFF FSL-LUBBOCK CO., TX.-GRAIN SORGHUM-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	9.8	26.4	16.6
46	18.7	30.8	12.1
61	23.8	31.8	8.0
76	25.0	31.0	6.0
91	23.7	30.3	6.6
107	23.0	30.0	7.0
122	22.7	29.5	6.8
137	21.7	29.2	7.5
152	21.2	29.2	8.0
168	22.1	29.9	7.8
183	23.0	30.2	7.2
198	23.5	29.8	6.3
221	24.2	29.3	5.1
252	25.5	29.0	3.5

TOTAL WATER EXTRACTED FROM PROFILE = 21.7 Cm.

AMSTERDAM

CLASSIFICATION: FINE-SILTY, MIXED, FRIGID TYPIC USTOCHREPT

S 80MT-031 -001 SAMPLE NOS. 80P2305 - 2314 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM)-(>2MM) WEIGHT 2 -5	WEIGHT 5 -20	WEIGHT 20 -75	WEIGHT .1- 75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
802305	1	0- 15	AP	25.5	55.8	18.7			17.9	37.9	15.7	1.8	0.7	0.4	0.1	TR	TR	--	3	--
802306	2	15- 28	A12	24.0	63.9	12.1			21.9	42.0	10.9	0.9	0.2	0.1	TR	TR	--	--	1	--
802307	3	28- 53	B21	21.0	65.9	13.1	7		23.9	42.0	11.9	0.9	0.2	0.1	TR	--	--	--	1	--
802308	4	53- 84	B22	18.4	67.1	14.5	4		22.5	44.6	13.1	1.0	0.3	0.1	TR	--	--	--	1	--
802309	5	84-114	C1	15.6	69.5	14.9	3		23.0	46.5	14.0	0.7	0.2	TR	TR	TR	--	--	1	--
802310	6	130-145	C1	15.1	70.1	14.8			24.1	46.0	13.8	0.8	0.1	0.1	TR	--	--	--	1	--
802311	7	160-175	C2	14.7	67.3	18.0	1		22.5	44.8	16.6	1.0	0.3	0.1	TR	--	--	--	1	--
802312	8	191-206	C2	15.6	65.9	18.5	2		21.8	44.1	17.6	1.0	0.3	0.1	0.1	TR	--	--	1	--
802313	9	221-236	C2	19.7	59.6	20.7	4		21.8	37.8	19.2	1.2	0.2	0.1	TR	TR	--	--	1	--
802314	10	252-267	C2	24.3	52.0	23.7	3		17.7	34.3	20.9	2.2	0.4	0.2	TR	TR	--	--	3	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B1B	EXTR TOTAL P 6S1A	EXTR TOTAL S 6K3A	DITH-CIT EXTRACTABLE FE 6G2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6D2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG - LIMITS - LL 4F1	ATTERBERG - LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	BULK DENSITY WHOLE SOIL 4D1	COLE WATER CONTENT 2- BAR 4B1A	COLE WATER CONTENT 0.06 BAR 4B1C	COLE WATER CONTENT 1/3 BAR 4B1C	COLE WATER CONTENT 15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT	<0.4MM	<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
802305	1	0.91	0.077						0.91	0.43				1.20			16.1			11.0	
802306	2	0.71	0.074						0.86	0.45				1.28	1.35	0.018	16.0	27.5	21.3	10.9	0.13
802307	3	0.44	0.046						0.72	0.46				1.29	1.34	0.013	15.0	28.4	21.6	9.7	0.15
802308	4	0.31							0.78	0.45				1.31	1.38	0.018	12.6		21.2	8.3	0.17
802309	5	0.30							1.01	0.51				1.28	1.33	0.015	11.6		22.8	7.9	0.19
802310	6	0.22							0.92	0.51				1.33	1.43	0.024	11.5		26.6	7.7	0.25
802311	7	0.26							0.95	0.52				1.27	1.30	0.008	11.2		26.7	7.6	0.24
802312	8	0.27							0.99	0.53				1.30	1.10		12.1			8.2	
802313	9	0.27							0.86	0.48				1.24	1.29	0.013	13.4		24.2	9.4	0.18
802314	10	0.26							0.79	0.49				1.30			16.6			11.9	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E4A 6N2E	NH4OAC EXTRACTABLE BASES MG 5E4A 6O2D	NH4OAC EXTRACTABLE BASES NA 5E4A 6P2B	NH4OAC EXTRACTABLE BASES K 5E4A 6Q2B	NH4OAC EXTRACTABLE BASES SUM BASES	ACID-ITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-UAC 5A6A	EXCH NA 5U2	SAR SE	BASE SATURATION SUM 5C3	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C	CASO4 AS GYPSUM <20MM 6F1C	SAT PASTE 8C1B	CACL2 .01M 1:2 8C1E	H2O 1:1 8C1A
		<- MEQ / 100 G ->										<- PCT ->		PCT		<- PCT ->				
802305	1	16.0	5.6	0.1	1.2	24.9	1.5	26.4	23.1	TR	TR	94	100	--	1800			7.2	7.2	7.6
802306	2		7.7	TR	0.6				20.7	TR	TR		100	4	2100			7.7	7.7	8.0
802307	3		9.5	0.1	0.4				15.1				100	14					8.0	8.4
802308	4		13.8	0.1	0.5				14.3	TR	TR		100	12	2400			8.3	8.2	8.6
802309	5		15.8	0.3	0.6				15.8	2	1		100	11	2300	--		8.2	8.3	8.7
802310	6		12.9	1.4	0.6				13.9	8	6		100	11	2100			8.5	8.4	9.0
802311	7		10.8	2.0	0.6				14.0	12	7		100	13	1900			8.6	8.4	9.0
802312	8		10.9	1.8	0.6				15.5	10	6		100	9	1900			8.4	8.4	8.9
802313	9		11.5	1.8	0.6				17.0	9	6		100	9	1800			8.4	8.2	9.1
802314	10		13.8	2.0	0.7				19.2	9	6		100	5	1700			8.3	8.1	8.9

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6Q1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D3	ELEC. COND. 8A1A MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2H	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY DTA <2U 7A3	MINERALOGY DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 603A	TOT ANL 7C3 CLAY Fe 6C7A
		<- MEQ / LITER ->									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->				<- PCT ->			
802305	1	3.6	1.6	0.3	0.4	--	2.9	0.3	0.8	0.2	50.6	TR	0.55								
802306	2	2.8	1.5	0.2	0.2	--	2.7	0.3	0.4	0.6	56.6	TR	0.44	MT 4	MI 2	KK 2	CA 2	KK13		2.0	5.0
802307	3												0.24								
802308	4	1.2	3.6	0.4	0.2	--	2.7	0.2	0.5	0.8	49.5	TR	0.46	MT 4	MI 2	KK 2	CA 2	KK 6		1.7	4.0
802309	5	0.8	3.6	1.3	0.2	--	3.3	0.4	0.7	0.8	44.0	TR	0.59								
802310	6	0.9	1.9	0.1	0.2	--	4.8	0.3	1.7	0.2	37.6	TR	0.78								
802311	7	0.9	1.0	7.1	0.1	--	5.4	0.3	1.9	0.2	45.0	TR	0.82	MT 3	MI 2	KK 2	CA 2	KK 3		1.7	3.9
802312	8	1.7	1.0	0.4	0.2	--	5.7	0.4	1.8	0.2	43.0	TR	0.76								
802313	9	1.2	1.1	5.9	0.1	--	4.7	0.3	2.2	0.2	43.5	TR	0.74								
802314	10	1.0	1.3	6.1	0.1	--	4.0	0.3	2.8	0.1	47.8	TR	0.81								

ESTIMATED BULK DENSITY FOR LAYER 1, 8, 10.

MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS 3.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE CA CALCITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Amsterdam.

Pedon Number: S80MT-031-1

Classification: Fine-silty, mixed, frigid Typic Ustochrepts.

Location: Gallatin County, Montana: 766 meters south and 18 meters east of the NW corner of Sec. 31. Spring Wheat Plot, 60 lbs. nitrogen, Replicate 1 of Paul Brown Study.

Use and Vegetation: Presently fallow - previously cropped to wheat.

Parent Material: Loess.

Region: Northern Rocky Mountain Valleys - MLRA 44.

Position: Convex ridgetop - between valley floor and mountain footslope.

Elevation: About 1440 meters.

Drainage and Permeability: Well drained, moderatley rapid permeability.

Water Table and Duration: None.

Slope: 2 percent, SE aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-11-80

Ap -- 0 to 15 cm.; very dark grayish brown (10YR3/2) silt loam, brown (10YR4/3) dry; weak fine and medium granular structure; slightly hard, very friable; common fine roots; few silt coatings at lower boundary; mildly alkaline; clear smooth boundary. (802305).

A12 -- 15 to 28 cm.; brown (10YR4/3) silt loam, brown (10YR5/3) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; common fine roots; common fine and medium pores; few silt coatings on ped faces; horizon is slightly compact and brittle; weak effervescence in lower part, moderately alkaline; clear smooth boundary. (802306).

B21 -- 28 to 53 cm.; brown (10YR5/3) silt loam, light brownish gray (10YR6/2) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; few fine roots and pores; common silt coatings on faces of peds; carbonates are finely dispersed and not visible to the eye; strong effervescence, moderately alkaline; gradual smooth boundary. (802307).

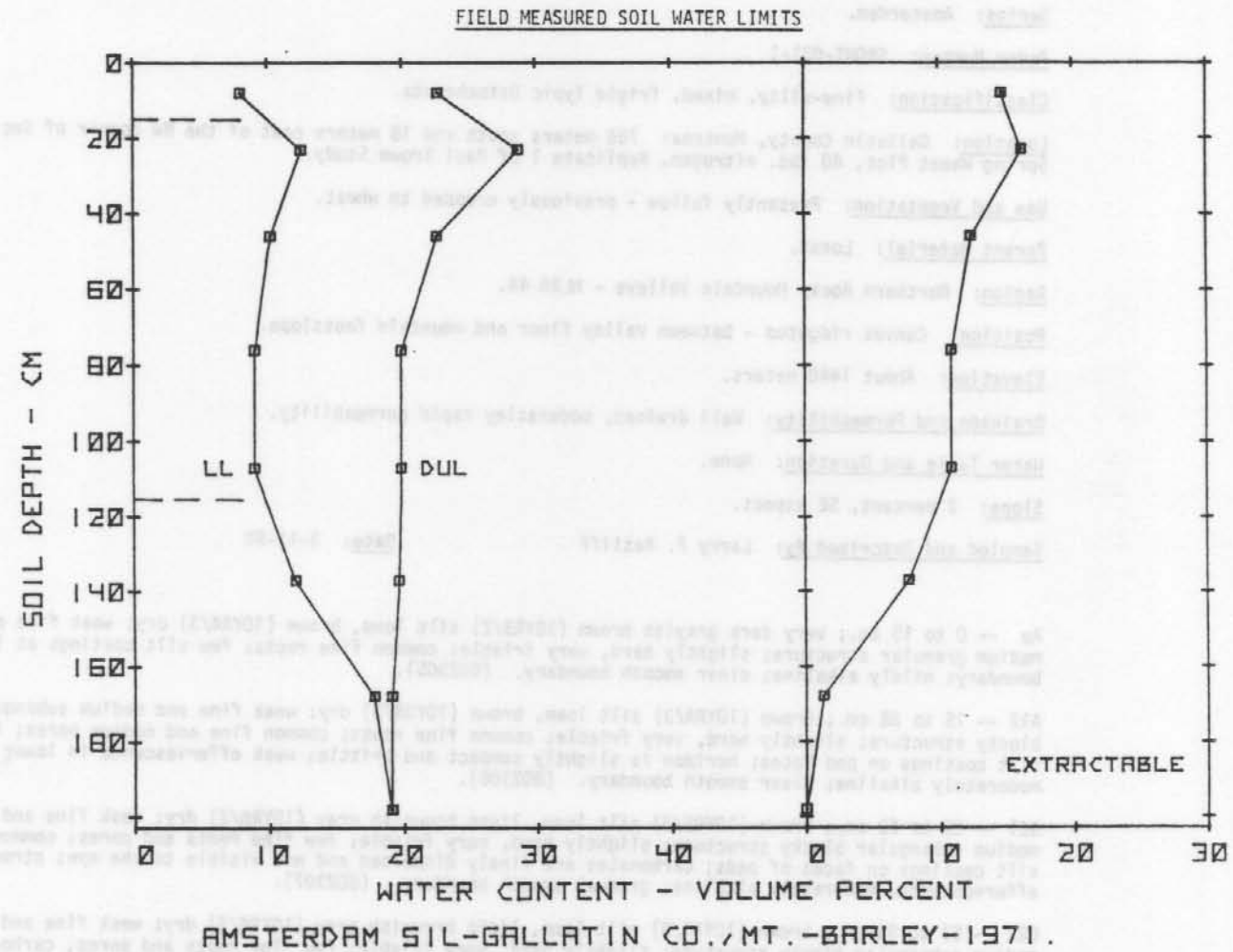
B22 -- 53 to 99 cm.; brown (10YR5/3) silt loam, light brownish gray (10YR6/2) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; few fine roots and pores; carbonates are finely dispersed and not visible to the eye; strong effervescence, strongly alkaline; gradual smooth boundary. (802308).

C1 -- 99 to 160 cm.; brown (10YR5/3) silt loam, light gray (10YR7/2) dry; massive to weak fine subangular blocky structure; slightly hard, very friable; few fine roots and pores; carbonates are finely dispersed and not visible to the eye; strong effervescence, strongly alkaline; gradual smooth boundary. (802309, 310).

C2 -- 160 to 267 cm.; brown (10YR5/3) silt loam, light gray (10YR7/2) dry; massive; slightly hard, very friable; few fine pores; carbonates are finely dispersed and not visible to the eye; strong effervescence, strongly alkaline. (802311, 312, 313, 314).

Field Measured Soil Water Data Contributed By: P. L. Brown, USDA-AR, Plant and Soil Science Department. Montana State University.

Pedon Number: S80MT-031-1

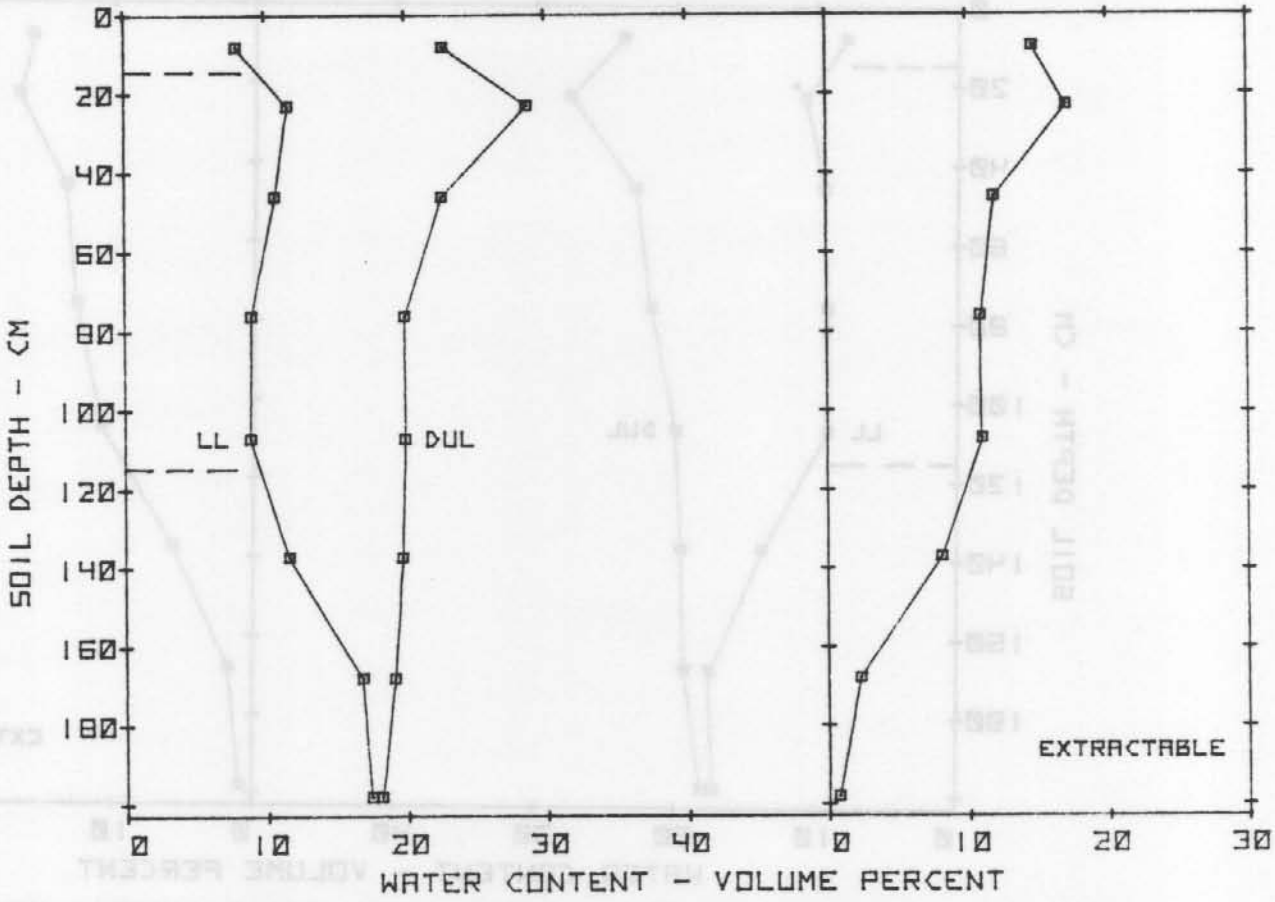


SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	8.0	22.7	14.7
23	12.5	28.7	16.2
46	10.2	22.6	12.4
76	9.0	19.9	10.9
107	9.0	19.9	10.9
137	12.0	19.7	7.7
168	17.8	19.1	1.3
198	19.1	19.1	0.0

TOTAL WATER EXTRACTED FROM PROFILE = 18.0 Cm.

Pedon Number: S80MT-031-1

FIELD MEASURED SOIL WATER LIMITS



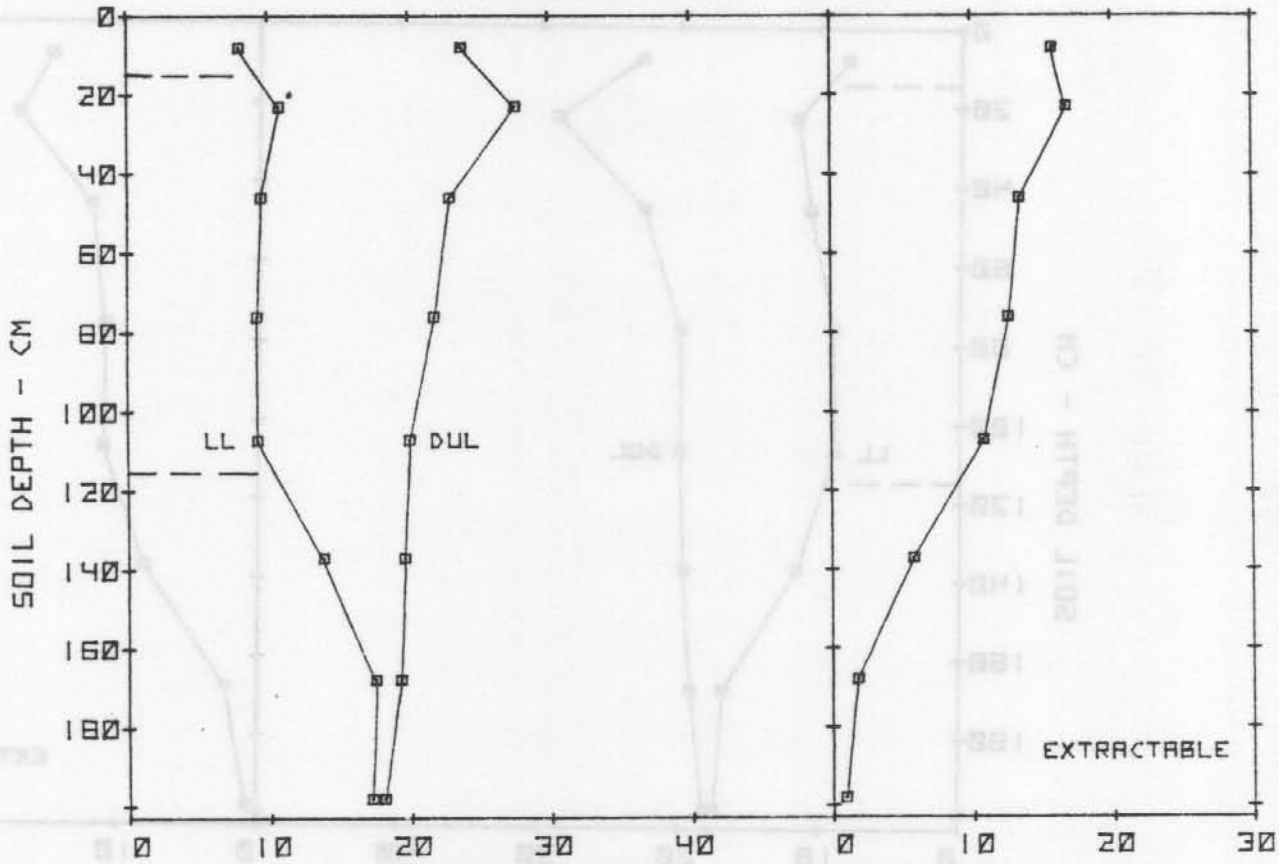
AMSTERDAM SIL-GALLATIN CO.,MT.-S.WHEAT-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	8.0	22.7	14.7
23	11.6	28.7	17.1
46	10.7	22.6	11.9
76	9.0	19.9	10.9
107	8.9	19.9	11.0
137	11.6	19.7	8.1
168	16.8	19.1	2.3
198	17.4	18.1	0.7

TOTAL WATER EXTRACTED FROM PROFILE = 18.7 Cm.

Pedon Number: S80MT-031-1

FIELD MEASURED SOIL WATER LIMITS



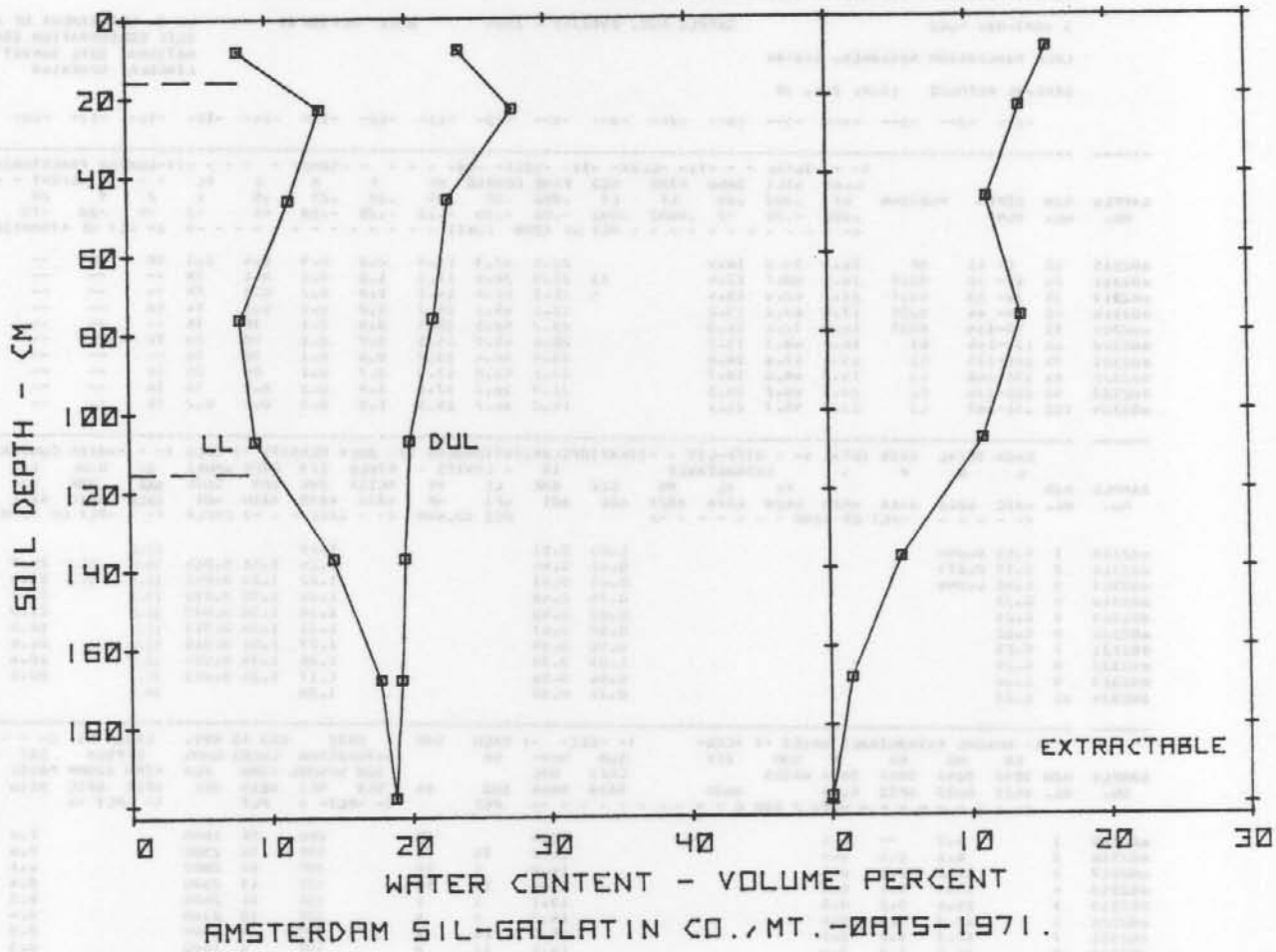
AMSTERDAM SIL-GALLATIN CO./MT.-W.WHEAT-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	8.0	23.8	15.8
23	10.8	27.6	16.8
46	9.5	22.9	13.4
76	9.2	21.8	12.6
107	9.2	20.0	10.8
137	13.8	19.6	5.8
168	17.5	19.3	1.8
198	17.2	18.1	0.9

TOTAL WATER EXTRACTED FROM PROFILE = 18.9 Cm.

Pedon Number: S80MT-031-1

FIELD MEASURED SOIL WATER LIMITS



AMSTERDAM SIL-GALLATIN CO./MT.-OATS-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	8.0	23.8	15.8
23	13.8	27.6	13.8
46	11.5	22.9	11.4
76	8.0	21.8	13.8
107	9.0	20.0	11.0
137	14.5	19.6	5.1
168	17.8	19.3	1.5
198	18.8	18.8	0.0

TOTAL WATER EXTRACTED FROM PROFILE = 17.7 Cm.

ARSTEKCAM I

CLASSIFICATION: FINE-SILTY, MIXED, ARGIC CRYOBOROLL

S 8GMT-031 -002 SAMPLE NOS. 80P2315 - 2324 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	COARSE FRACTIONS(MM) WEIGHT 5 -20	COARSE FRACTIONS(MM) WEIGHT 20 -75	>2MM WEIGHT .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
802315	1S	0- 15	AP	21.3	54.6	18.9			22.5	37.3	15.3	2.2	0.9	0.4	0.1	TR	TR	--	4	--
802316	2S	15- 30	B21T	20.9	60.7	12.4		11	21.9	38.8	11.2	1.0	0.1	0.1	TR	--	--	--	1	--
802317	3S	30- 53	B22T	21.7	62.9	15.4		4	21.3	41.6	14.1	1.0	0.2	0.1	TR	--	--	--	1	--
802318	4S	84- 84	B22T	17.6	67.2	15.2			22.1	45.1	14.2	0.8	0.1	0.1	TR	TR	--	--	1	--
802319	5S	99-114	B22T	10.8	72.2	11.0			23.7	48.5	10.4	0.5	0.1	TR	TR	--	--	--	1	--
802320	6S	130-145	C1	10.4	68.3	15.3			22.6	45.7	14.5	0.7	0.1	TR	TR	TR	--	--	1	--
802321	7S	160-175	C1	15.6	67.8	10.6			23.4	44.4	15.7	0.8	0.1	TR	TR	--	--	--	1	--
802322	8S	191-206	C2	15.3	66.0	18.7			23.1	42.9	17.9	0.7	0.1	TR	TR	TR	--	--	1	--
802323	9S	222-236	C2	20.3	60.2	19.5			21.9	38.3	17.6	1.4	0.2	0.1	TR	TR	--	--	2	--
802324	10S	251-267	C2	23.2	55.7	21.1			19.0	36.7	19.0	1.5	0.3	0.1	0.2	TR	--	--	2	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B1B	EXTR TOTAL P 6S1A	EXTR TOTAL S 6R3A	FE 6C2B	AL 6G7A	MN 6D2A	CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	BULK DENSITY WHOLE SOIL 4D1	COLE WHOLE SOIL 4B1A	WATER CONTENT 2- BAR 4B1C	WATER CONTENT 0.06 BAR	WATER CONTENT 1/3 BAR 8A2	WATER CONTENT 15 BAR 4C1	WRD WHOLE SOIL
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->					CM/CM
802315	1	0.93	0.094						1.05	0.51				1.20			15.6			10.9		
802316	2	0.73	0.073						0.61	0.44				1.24	1.31	0.016	18.0	32.4	24.9	11.8	0.16	
802317	3	0.40	0.048						0.65	0.43				1.22	1.26	0.011	14.3	35.0	21.8	9.3	0.15	
802318	4	0.33							0.79	0.48				1.26	1.30	0.010	13.2		21.1	8.4	0.16	
802319	5	0.23							0.82	0.43				1.30	1.38	0.020	11.8		21.0	7.2	0.18	
802320	6	0.22							0.87	0.47				1.31	1.36	0.013	11.7		18.0	7.7	0.14	
802321	7	0.23							0.96	0.49				1.27	1.31	0.010	11.6		28.8	7.7	0.24	
802322	8	0.24							1.05	0.59				1.26	1.34	0.015	12.9		20.6	9.0	0.15	
802323	9	0.26							0.86	0.50				1.17	1.26	0.025	14.7		20.5	10.1	0.12	
802324	10	0.23							0.76	0.50				1.20			16.1			11.7		

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A 6A2E	NH4OAC EXTRACTABLE BASES MG 5B4A 6D2D	NH4OAC EXTRACTABLE BASES NA 5B4A 6P2B	NH4OAC EXTRACTABLE BASES K 5B4A 6Q2B	NH4OAC EXTRACTABLE BASES SUM BASES 6H2B	ACIDITY	CEC SUM CATS 5A3A	CEC NH4- OAC 5A6A	EXCH NA 5D2 PCT	SAR 5E	BASE SATURATION SUM 5C3	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1B PCT	RES. OHMS /CM 8E1	GASG4 AS GYPSUM <2MM 6F1C	GASG4 AS GYPSUM <20MM 6F1C	SAT PASTE 8C1B	PH .01M CACL2 8C1E 1:2	PH H2O 8C1A 1:1
		<- - - - - - - - - -MEQ / 100 G - - - - - - - - - ->								PCT		<- -PCT- >		PCT		<- -PCT ->				
802315	1		4.3	--	1.1				22.4		TR	100		TR	1800			7.8	7.6	8.1
802316	2		6.1	0.1	0.4				16.3	TR	TR	100		18	2500			7.0	7.7	8.2
802317	3		11.1	0.1	0.4				14.0	1	TR	100		14	2800			8.1	7.9	8.5
802318	4		15.4	0.1	0.5				13.9	TR	TR	100		13	2600			8.4	8.2	8.7
802319	5		15.6	0.2	0.5				13.7	1	1	100		11	2600			8.5	8.3	8.8
802320	6		13.7	0.8	0.6				14.2	5	4	100		10	2300			8.4	8.3	9.0
802321	7		12.2	1.6	0.6				14.0	10	7	100		9	1900			8.5	8.3	9.1
802322	8		11.5	2.2	0.6				16.1	11	8	100		8	1600			8.5	8.3	9.1
802323	9		12.8	1.9	0.7				17.5	9	7	100		7	1600			8.3	8.1	8.8
802324	10		12.7	1.8	0.6				17.7	7	5	100		8	1100	--		8.1	8.1	8.5

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	WATER EXTRACTED FROM SATURATED PASTE MG 6G1B	WATER EXTRACTED FROM SATURATED PASTE NA 6P1B	WATER EXTRACTED FROM SATURATED PASTE K 6Q1B	WATER EXTRACTED FROM SATURATED PASTE CO3 6I1B	WATER EXTRACTED FROM SATURATED PASTE HCO3 6J1B	WATER EXTRACTED FROM SATURATED PASTE CL 6K1C	WATER EXTRACTED FROM SATURATED PASTE SO4 6L1C	WATER EXTRACTED FROM SATURATED PASTE NO3 6M1C	WATER EXTRACTED FROM SATURATED PASTE H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A1A MMHOS /CM	MINERALOGY - CLAY X-RAY <2U 7A2B	MINERALOGY - CLAY DTA <2U 7A2B	MINERALOGY - CLAY DTA <2U 7A3	TOT CLAY ANL 7C3 CLAY K2O 6Q3A	TOT CLAY ANL 7C3 CLAY Fe 6C7A
		<- - - - - - - - - -MEQ / LITER - - - - - - - - - ->									<- -PCT ->			<- RELATIVE AMOUNTS ->			<- - - - -PCT - - - ->	
802315	1	4.7	1.0	0.2	0.3	--	3.5	0.2	0.5	0.5	48.2	TR	0.80					
802316	2	2.9	1.4	0.3	0.1	--	2.5	0.2	0.7	0.3	48.8	TR	0.46	MI 3	CA 3	MI 2	KK 1	KK 5	1.4	3.5
802317	3	1.6	2.3	0.4	0.1	--	2.7	0.2	0.6	0.4	46.0	TR	0.44							
802318	4	1.0	3.3	0.5	0.2	--	3.1	0.1	0.4	0.2	43.4	TR	0.46							
802319	5	0.8	3.4	1.1	0.2	--	3.4	0.1	0.6	0.3	41.9	TR	0.51	MI 3	MI 2	KK 4	CA 2	KK 5	1.6	3.8
802320	6	0.6	2.2	4.3	0.2	--	4.7	0.2	1.0	0.2	41.2	TR	0.85							
802321	7	0.7	1.3	7.4	0.1	--	5.7	0.2	1.7	0.2	39.9	TR	0.80							
802322	8	1.0	1.1	7.9	0.1	--	5.9	0.2	2.3	--	40.2	TR	0.84	MI 3	CA 2	MI 2	KK 2	KK 3	1.6	3.9
802323	9	1.3	1.7	8.0	0.1	--	4.1	0.3	4.9	--	44.1	TR	1.01							
802324	10	4.1	5.5	11.2	0.2	--	2.6	0.6	16.3	--	45.7	0.1	1.82							

ESTIMATED BULK DENSITY FOR LAYER 1, 1G,

ANALYSES: S= ALL OR SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL CA CALCITE MI MICA KK KAOLINITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Amsterdam taxadjunct[1/].

Pedon Number: S80MT-031-2

Classification: Fine-silty, mixed Argic Cryoborolls[1/].

Location: Gallatin County, Montana: 740 meters south and 13 meters east of the NW corner of Sec. 31. Oats plot - 60 lbs. nitrogen, Replicate 1 of Paul Brown Study.

Use and Vegetatation: Presently fallow - previously cropped to wheat.

Parent Material: Loess.

Region: Northern Rocky Mountain Valleys - MLRA 44.

Position: Convex ridgetop - between valley floor and mountain footslope.

Elevation: About 1440 meters.

Drainage and Permeability: Well drained, moderately rapid permeability.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 8-11-80

Ap -- 0 to 15 cm.; dark brown (10YR3/3) silt loam, brown (10YR4/3) dry; weak fine and medium granular structure; slightly hard, very friable; common fine roots; common silt coatings at lower boundary; non-calcareous, moderately alkaline; clear smooth boundary. (802315).

B21t -- 15 to 36 cm.; pale brown (10YR6/3) heavy silt loam, light gray (10YR7/2) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; common fine roots; common fine and medium pores; few thin and patchy clay films on faces of peds; common silt coatings on faces of peds; horizon is slightly compact and brittle; carbonates are finely dispersed and not visible to the eye; strong effervescence, moderately alkaline; clear smooth boundary. (802316).

B22 -- 36 to 119 cm.; pale brown (10YR6/3) silt loam, very pale brown (10YR7/3) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; common fine roots; few fine pores; thin patchy clay films on faces of peds; carbonates are finely dispersed; strong effervescence, strongly alkaline; diffuse wavy boundary. (802317, 318, 319).

C1 -- 119 to 178 cm.; brown (10YR5/3) silt loam, pale brown (10YR6/3) dry; massive to weak fine subangular blocky structure; slightly hard, very friable; few very fine roots and pores; few dark brown stains; carbonates are finely dispersed; strong effervescence, very strongly alkaline; diffuse wavy boundary. (802320, 321).

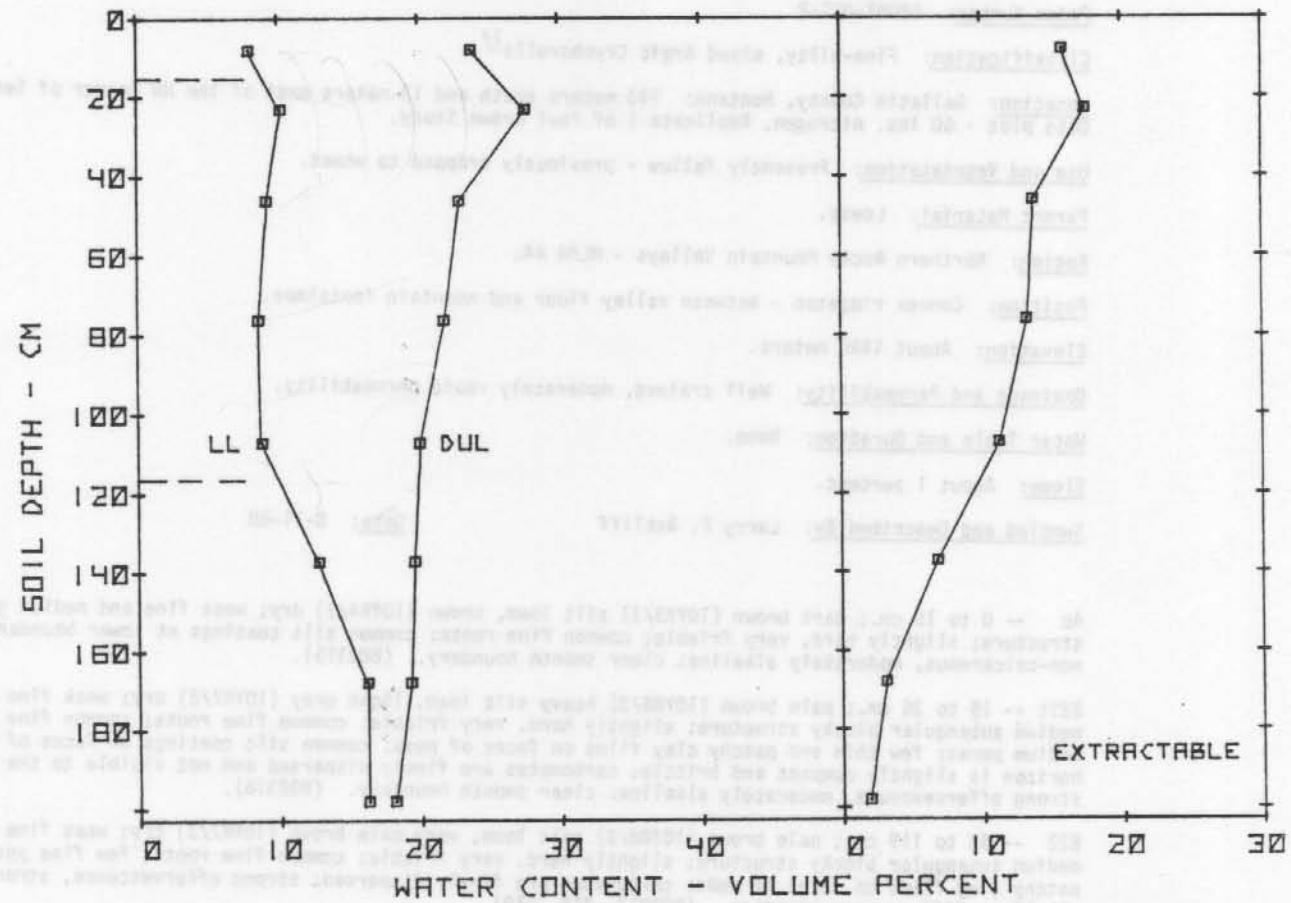
C2 -- 178 to 267 cm.; brown (10YR5/3) silt loam, pale brown (10YR6/3) dry; massive to weak fine subangular blocky structure; slightly hard, very friable; carbonates are finely dispersed; strong effervescence, strongly alkaline; diffuse wavy boundary. (802322, 323, 324).

Remarks: [1/]Pedon differs from Amsterdam by having a weakly expressed argillic horizon beginning at about 15 cm. Epipedon does not meet the thickness requirement for mollic. Use and management is not expected to differ from Amsterdam.

Field Measured Soil Water Data Contributed By: P. L. Brown, USDA-AR, Plant and Soil Science Department, Montana State University.

Pedon Number: S80MT-031-2

FIELD MEASURED SOIL WATER LIMITS



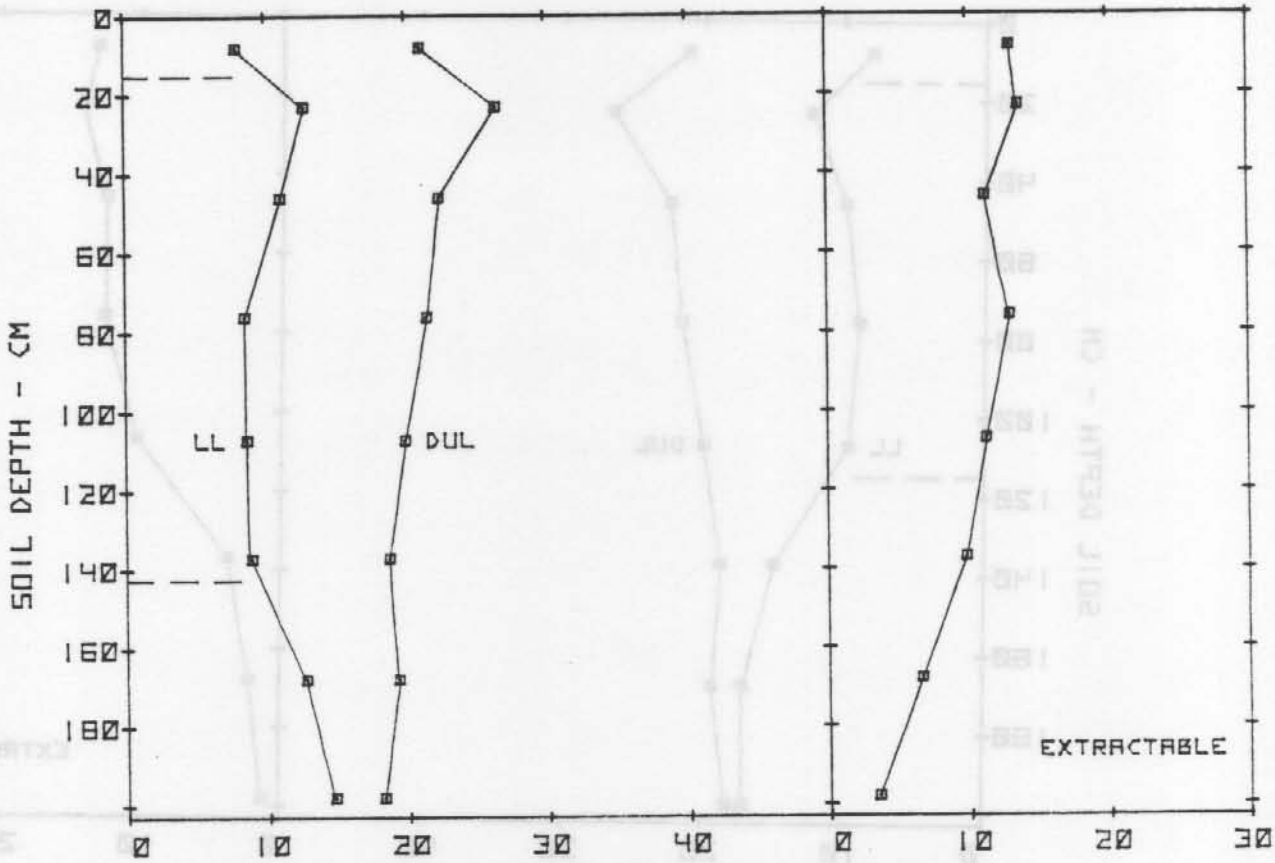
AMSTERDAM SIL TAXADJ.-GALLATIN CO./MT.-S.WHEAT-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	8.0	23.8	15.8
23	10.2	27.6	17.4
46	9.2	22.9	13.7
76	8.6	21.8	13.2
107	8.8	20.0	11.2
137	12.8	19.6	6.8
168	16.2	19.3	3.1
198	16.2	18.1	1.9

TOTAL WATER EXTRACTED FROM PROFILE = 20.4 Cm.

Pedon Number: S80MT-031-2

FIELD MEASURED SOIL WATER LIMITS



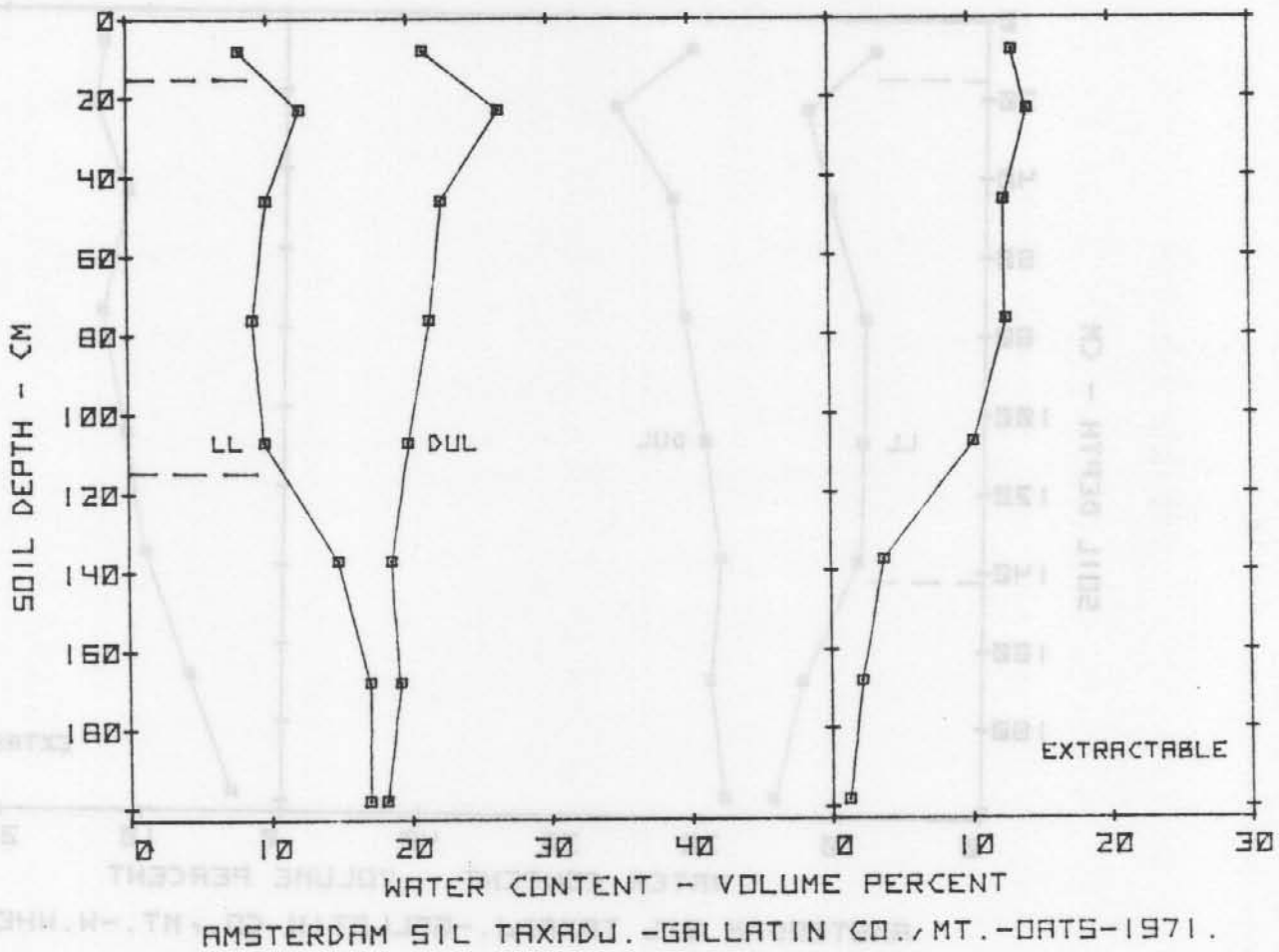
AMSTERDAM SIL TAXADJ.-GALLATIN CO., MT.-W.WHEAT-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	8.0	21.1	13.1
23	12.8	26.5	13.7
46	11.1	22.4	11.3
76	8.5	21.5	13.0
107	8.6	19.9	11.3
137	8.9	18.7	9.8
168	12.7	19.3	6.6
198	14.7	18.2	3.5

TOTAL WATER EXTRACTED FROM PROFILE = 21.1 Cm.

Pedon Number: S80MT-031-2

FIELD MEASURED SOIL WATER LIMITS

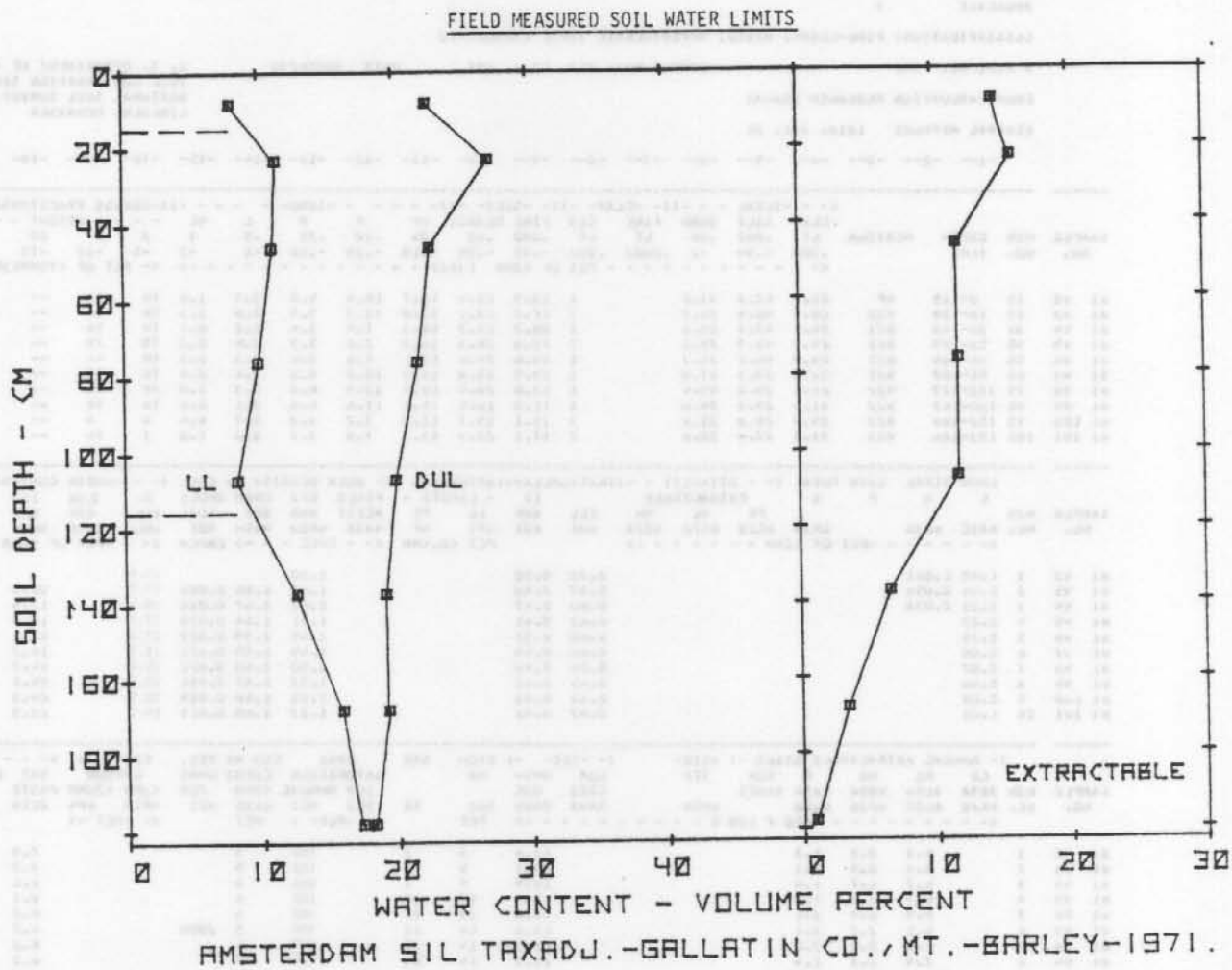


AMSTERDAM SIL TAXADJ.-GALLATIN CO., MT.-DATS-1971.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	8.0	21.1	13.1
23	12.3	26.5	14.2
46	9.9	22.4	12.5
76	8.9	21.5	12.6
107	9.7	19.9	10.2
137	14.9	18.7	3.8
168	17.1	19.3	2.2
198	17.0	18.2	1.2

TOTAL WATER EXTRACTED FROM PROFILE = 17.2 Cm.

Pedon Number: S80MT-031-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	8.0	22.5	14.5
23	11.3	27.1	15.8
46	11.0	22.7	11.7
76	9.9	21.7	11.8
107	8.3	20.0	11.7
137	12.6	19.2	6.6
168	15.9	19.3	3.4
198	17.3	18.2	0.9

TOTAL WATER EXTRACTED FROM PROFILE = 18.8 Cm.

AVONDALE V

CLASSIFICATION: FINE-LOAMY, MIXED, HYPERTHERMIC TYPIC CAMBORTHID

S 80AZ-021 -001 SAMPLE NOS. 81P 92 - 101 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEA-AK

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGS WEIGHT 2-5	COARSE FRAGS WEIGHT 5-20	COARSE FRAGS WEIGHT 20-75	COARSE FRAGS WEIGHT 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 92	1S	0- 15	AP	20.5	42.3	37.2		1	18.9	23.4	16.7	10.4	5.0	3.5	1.6	TR	TR	--	20	TR
81 93	2S	15- 28	A12	20.9	40.4	38.7		1	17.2	23.2	17.0	11.3	5.5	3.6	1.3	TR	TR	--	22	TR
81 94	3S	28- 48	B21	24.9	45.3	29.8		1	20.0	25.3	16.3	7.4	3.4	2.2	0.5	TR	TR	--	13	--
81 95	4S	48- 69	B21	24.9	45.9	29.2		1	19.6	26.3	16.0	7.1	3.3	2.6	0.2	TR	TR	--	13	TR
81 96	5S	69- 84	B21	24.5	44.2	31.3		1	19.6	24.6	17.1	7.8	3.6	2.3	0.5	TR	--	--	14	TR
81 97	6S	84-107	B21	22.8	39.3	37.9		1	15.5	23.8	16.9	10.2	5.0	3.4	0.4	TR	TR	--	19	TR
81 98	7S	112-127	B22	21.0	33.0	45.4		1	13.0	20.0	18.8	13.5	6.8	5.3	1.0	TR	TR	--	27	TR
81 99	8S	132-147	B22	31.5	29.5	39.0		1	11.0	18.5	15.1	11.6	6.4	5.1	0.8	TR	TR	--	24	TR
81 100	9S	152-168	B23	39.8	26.8	33.4		1	11.1	15.7	11.3	7.2	4.8	5.7	4.4	6	4	--	30	10
81 101	10S	173-188	B23	31.8	37.4	30.8		2	17.1	20.3	15.3	7.8	3.7	3.0	1.0	1	TR	--	16	1

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B3A	EXTR TOTAL P 6P2B	EXTR TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6D2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG - LIMITS - LL 4F1	ATTERBERG - LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT	<0.4MM	<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - - ->				CM/CM
81 92	1	0.48	0.061						0.72	0.50				1.50			14.5			10.3	
81 93	2	0.44	0.054						0.67	0.48				1.63	1.66	0.006	14.7		16.8	10.0	0.11
81 94	3	0.21	0.036						0.60	0.47				1.62	1.67	0.010	16.4		17.4	11.7	0.09
81 95	4	0.13							0.62	0.41				1.51	1.64	0.028	17.2		18.0	10.3	0.12
81 96	5	0.11							0.60	0.51				1.49	1.59	0.022	17.1		17.6	12.5	0.08
81 97	6	0.08							0.66	0.49				1.49	1.59	0.022	15.7		16.2	11.2	0.07
81 98	7	0.07							0.56	0.46				1.50	1.60	0.022	14.4		14.7	10.3	0.07
81 99	8	0.08							0.45	0.42				1.32	1.47	0.036	18.6		25.1	13.3	0.16
81 100	9	0.08							0.45	0.43				1.35	1.48	0.029	22.5		24.3	17.1	0.09
81 101	10	0.06							0.42	0.42				1.53	1.60	0.015	18.5		20.5	13.2	0.11

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	NH4OAC EXTRACTABLE BASES MG 5B5A 6Q2C	NH4OAC EXTRACTABLE BASES NA 5B5A 6P2B	NH4OAC EXTRACTABLE BASES K 5B5A 6Q2B	NH4OAC EXTRACTABLE BASES SUM BASES	ACID-ITY 6H5A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	EXCH NA 5Q2	SAR 5E	BASE SATURATION SUM NH4OAC 5C3	BASE SATURATION CA 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	GYPSUM CASO4 AS <2MM 6F1A	GYPSUM CASO4 AS <20MM 6F4	SAT PASTE 8C1a	CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- - - - - - - - - - MEQ / 100 G - - - - - - - - - ->								PCT		<- -PCT- >		PCT		<- -PCT ->				
81 92	1		6.1	0.5	1.3				14.8	3	2	100	5					7.9	7.8	8.4
81 93	2		6.4	0.9	1.1				14.1	5	3	100	5					7.9	8.0	8.5
81 94	3		6.7	1.7	1.6				14.9	9	7	100	6					8.1	7.9	8.6
81 95	4		6.7	2.2	1.9				15.4	12	10	100	4					8.1	8.0	8.8
81 96	5		5.9	2.4	2.1				14.8	14	12	100	6					8.2	8.1	8.9
81 97	6		6.5	2.2	2.1				13.6	14	12	100	5	2000				8.2	8.1	8.9
81 98	7		6.4	2.0	2.0				12.2	14	12	100	4					8.2	8.0	8.9
81 99	8		7.9	2.3	2.4				14.3	14	11	100	7					8.2	8.1	8.9
81 100	9		10.6	2.6	3.3				18.1	12	10	100	15					8.3	8.0	8.7
81 101	10		9.3	2.4	2.8				13.2	15	12	100	20					8.3	8.0	8.9

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6G1B	NA 6P1B	K 6Q1B	CO3 6J1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O dA	TOTAL SALTS EST. 8D5	ELEC. COND. 8A3A MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K20 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- - - - - - - - - - MEQ / LITER - - - - - - - - - ->									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->			<- - - - PCT - - - ->			
81 92	1	2.8	1.3	2.7	0.4	--	4.0	0.8	1.2	0.2	34.4	TR	0.89							
81 93	2	3.2	2.0	5.5	0.3	--	3.8	2.7	3.0	1.0	34.7	TR	1.08	MI 3	MT 2	KK 2	CA 1	KK 8	3.0	4.7
81 94	3	1.8	1.1	6.3	0.3	--	3.7	1.5	4.8	0.5	36.1	TR	1.15							
81 95	4	1.0	0.6	8.6	0.3	--	3.7	1.3	4.0	0.5	37.1	TR	1.05	MI 3	KK 2	MT 1	CA 1	KK 9	3.9	5.4
81 96	5	0.6	0.5	8.8	0.3	--	4.9	1.5	3.6	0.4	35.9	TR	1.06							
81 97	6	0.6	0.5	8.6	0.4	--	3.6	1.5	3.6	0.4	35.7	TR	1.06							
81 98	7	0.5	0.5	8.4	0.4	--	3.5	1.5	3.6	0.4	35.1	TR	1.02							
81 99	8	0.5	0.5	7.7	0.4	--	4.4	1.1	3.6	0.4	44.8	TR	0.95	MI 3	KK 2	MT 1		KK10	4.0	5.6
81 100	9	0.4	0.6	7.4	0.5	--	3.5	0.9	3.6	0.5	59.1	TR	0.93	MI 3	KK 2	MT 1		KK 9	4.2	5.9
81 101	10	0.4	0.6	8.2	0.7	--	3.6	0.9	4.6	0.6	51.1	TR	1.06							

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: ON ALL UN SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Avondale Variant.

Pedon Number: S80AZ-021-1

Classification: Fine-loamy, mixed, hyperthermic Typic Camborthids.

Location: Maricopa County, Arizona: 574 meters east and 178 meters south of the NW corner of Sec. 30, T.1N., R.4E. Site is in the center of plot 2A of R. D. Jackson's 1979 and 1980 wheat study.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Loamy alluvium from igneous rock, quartzite and limestone.

Region: Central Arizona Basin and Range - MLRA 40.

Position: Low terrace in valley.

Elevation: About 336 meters.

Drainage and Permeability: Well drained, moderate permeability.

Water Table and Duration: None.

Slope: Less than 0.2 percent.

Sampled and Described By: Larry F. Ratliff Date: 10-6-80

Ap - 0 to 15 cm.; dark brown (7.5YR3/4) loam, brown (7.5YR5/4) dry; weak fine and medium granular structure; hard, very friable; many fine and very fine roots; strong effervescence, moderately alkaline; clear smooth boundary. (810092).

A12 - 15 to 31 cm.; dark reddish brown (5YR3/3) loam, reddish brown (5YR5/3) dry; weak medium subangular blocky structure; hard, friable; common fine and very fine roots; few fine pores; few pockets of coarse sand grains; 2 to 3 percent by volume of coarse fragments less than 4 mm. in diameter; strong effervescence, strongly alkaline; gradual wavy boundary. (810093).

B21 - 31 to 118 cm.; reddish brown (5YR4/4) heavy loam, light reddish brown (5YR6/4) dry; ped surfaces are slightly darker than matrix; weak fine subangular blocky structure; hard, friable; common fine and very fine roots; many fine and medium pores, few coarse pores; few threads of pale brown CaCO3; strong effervescence, strongly alkaline; gradual wavy boundary. (810094, 095, 096, 097).

B22 - 118 to 152 cm.; yellowish red (5YR4/6) loam, light reddish brown (5YR6/4) dry; weak fine subangular blocky structure; hard, friable; few fine and very fine roots; many fine and medium pores, few coarse pores; few threads of pale brown CaCO3; few coarse fragments less than 1 cm. in diameter; violent effervescence, strongly alkaline; clear wavy boundary. (810098, 099).

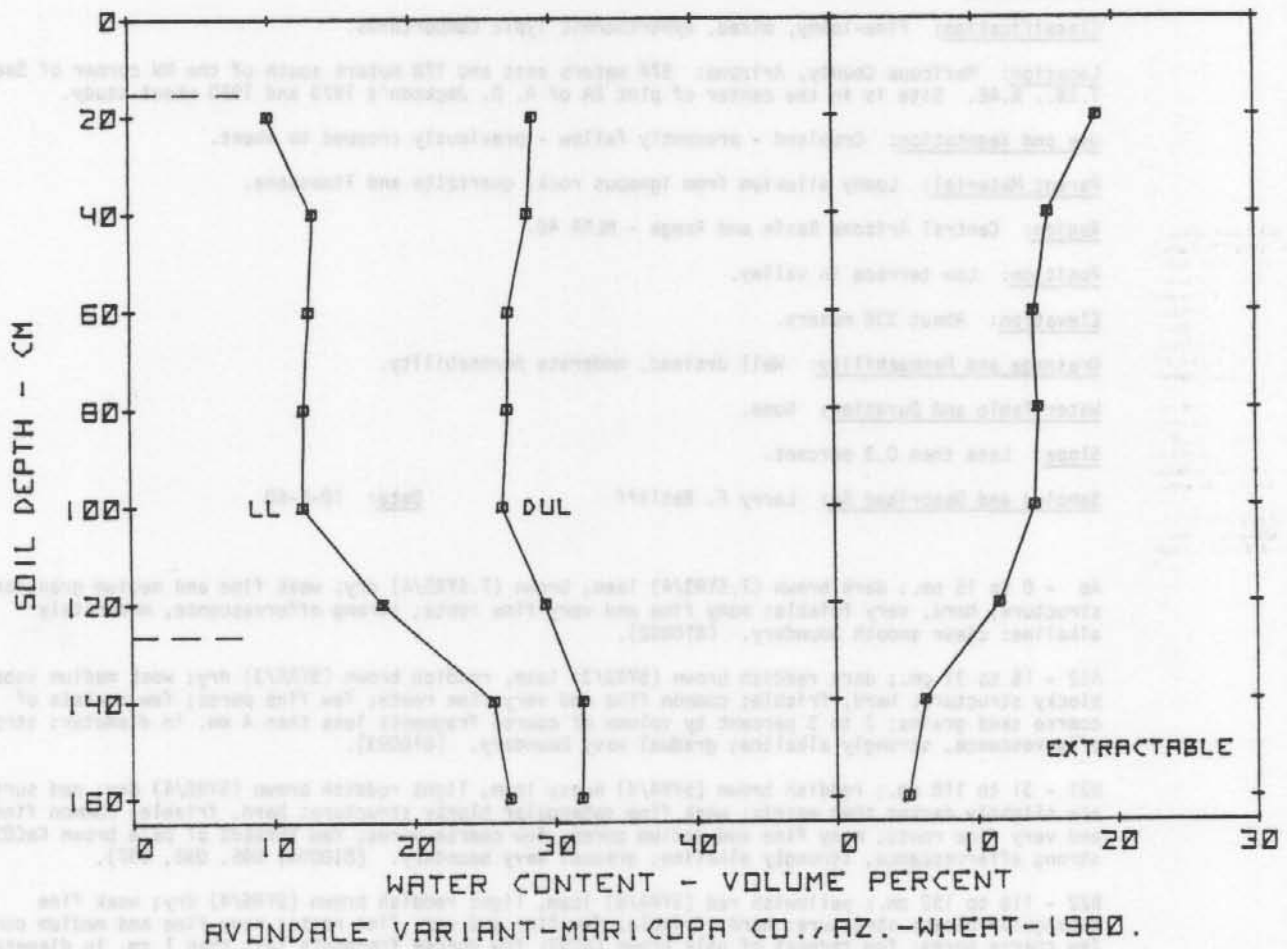
B23 - 152 to 191 cm.; reddish brown (5YR4/4) clay loam, light reddish brown (5YR6/4) dry; weak fine subangular blocky structure; very hard, firm; many fine and medium pores; estimated 10 to 15 percent by volume of white threads and masses of CaCO3; horizon is compact in place and has common brittle bodies which appear to be highly weathered coarse fragments; violent effervescence, strongly alkaline. (810100, 101).

Remarks: No evidence of fine stratification. Structure is weakly expressed but observation of core samples shows natural cleavage planes. There are common very fine flakes of mica throughout the profile.

Field Measured Soil Water Data Contributed By: R. D. Jackson, USDA-AR, U.S. Water Conservation Laboratory, Phoenix, Arizona.

Pedon Number: S80AZ-021-1

FIELD MEASURED SOIL WATER LIMITS



AVONDALE VARIANT-MARICOPA CO.,AZ.-WHEAT-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
20	9.9	28.7	18.8
40	13.0	28.3	15.3
60	12.7	26.9	14.2
80	12.3	26.8	14.5
100	12.2	26.4	14.2
120	17.8	29.4	11.6
140	25.7	32.0	6.3
160	26.8	31.9	5.1

TOTAL WATER EXTRACTED FROM PROFILE = 21.9 Cm.

AVOCADO V

CLASSIFICATION: FINE-LOAMY, MIXED, HYPERTHERMIC TYPIC CAMBORTHID

S 80AZ-021 -002 SAMPLE NOS. 81P 102 - 111 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-	-18-	-19-	-20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002 <- PCT OF <2MM	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .002	CLAY COS LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SILT VF .05 -.10	SAND VC 1 -2	SAND C .5 -1	SAND M .25 -.50	SAND F .10 -.25	SAND VF .05 -.10	COARSE FRACTIONS(MM) WEIGHT 2 -5	COARSE FRACTIONS(MM) WEIGHT 5 -20	COARSE FRACTIONS(MM) WEIGHT 20 -75	COARSE FRACTIONS(MM) WEIGHT 75 -> <- PCT OF <75MM(3B1) ->	>2MM WT PCT OF WHOLE SOIL
81 102	1S	0- 15	AP	21.0	41.0	38.0		1	17.3	23.7	16.2	10.9	5.4	3.7	1.8	TR	TR	--	22	TR
81 103	2S	15- 30	A12	21.8	42.0	36.2			17.7	24.3	15.7	11.1	5.0	3.3	1.1	TR	TR	--	20	TR
81 104	3S	33- 48	B21	18.8	42.7	38.5		1	18.4	24.3	18.7	10.6	4.9	3.4	0.9	TR	TR	--	20	TR
81 105	4S	53- 69	B21	20.3	41.2	38.0		1	17.1	24.1	18.1	10.2	4.7	3.3	1.7	1	--	--	21	1
81 106	5S	74- 89	B21	20.4	40.8	38.8		1	16.7	24.1	18.2	11.2	5.2	3.2	1.0	TR	TR	--	21	TR
81 107	6S	91-107	B22	17.1	34.9	48.0		1	13.8	21.1	20.8	15.7	8.6	3.9	1.0	TR	TR	--	27	TR
81 108	7S	112-127	B22	16.2	30.7	53.1		1	11.4	19.3	22.4	17.4	7.8	4.1	1.4	1	1	--	32	2
81 109	8S	132-147	B22	17.5	28.2	54.3		1	9.7	18.5	21.4	17.4	8.2	5.5	1.6	1	2	--	35	3
81 110	9S	152-168	B23	14.1	30.3	55.6		1	11.0	19.3	19.9	15.8	7.3	5.0	2.6	2	3	--	34	5
81 111	10S	193-208	B23	20.8	44.5	34.7		1	14.1	25.4	17.3	9.1	3.4	3.1	1.8	3	3	--	22	6

SAMPLE NO.	HZN NO.	ORGN TOTAL N 6A1C <- PCT OF <2MM	EXTR TOTAL P 6B3A	EXTR TOTAL S 6K3A	EXTRACTABLE FE 6B2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8D1	CEC/CLAY RATIO 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1 PCT	ATTERBERG LIMITS - PI 4F <0.4MM	BULK DENSITY - FIELD MOIST 4A3A <- G/CC	BULK DENSITY - 1/3 BAR 4A1D	BULK DENSITY - OVEN DRY 4A1H	COLE WHOLE SOIL 4D1 CM/CM	WATER CONTENT - 2- BAR 4B1A <- PCT OF	WATER CONTENT - 0.06 BAR 4B1C	WATER CONTENT - 1/3 BAR 4B2A	WATER CONTENT - 15 BAR 4C1	WRD WHOLE SOIL CM/CM
81 102	1	0.55	0.062					0.70	0.46			1.50				13.9		9.7		
81 103	2	0.50	0.055					0.67	0.45			1.57	1.67	0.021		14.1	16.9	9.8	0.11	
81 104	3	0.32	0.042					0.69	0.52			1.55	1.62	0.015		13.5	15.6	9.7	0.09	
81 105	4	0.15						0.62	0.49			1.45	1.53	0.018		14.0	16.3	10.1	0.09	
81 106	5	0.10						0.68	0.50			1.50	1.68	0.038		14.4	18.0	10.2	0.12	
81 107	6	0.07						0.65	0.52			1.50	1.59	0.020		13.4	13.9	8.9	0.07	
81 108	7	0.05						0.61	0.52			1.49	1.57	0.017		11.5	13.5	8.4	0.08	
81 109	8	0.05						0.58	0.49			1.49	1.57	0.017		11.6	14.3	8.5	0.09	
81 110	9	0.06						0.54	0.48			1.39	1.47	0.018		13.8	15.7	9.2	0.09	
81 111	10	0.04						0.60	0.53			1.41	1.54	0.029		16.2	21.1	11.1	0.14	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5E5A <- MEQ / 100 G	NH4OAC EXTRACTABLE BASES - MG 5E5A	NH4OAC EXTRACTABLE BASES - NA 5E5A	NH4OAC EXTRACTABLE BASES - K 5E5A	NH4OAC EXTRACTABLE BASES - SUM BASES 6H2B	ACIDITY 6H5A	CEC - SUM CATS 5A3A	CEC - NH4-OAC 5A6B	EXCH NA 5D2 PCT	SAR SE	BASE SATURATION SUM 5C3 <- PCT->	BASE SATURATION NH4OAC 5C1	CC3 AS CACO3 <2MM 6E1G PCT	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1A <- PCT ->	CASO4 AS GYPSUM <20MM 6F4	SAT PASTE 8C1B	PH CACL2 .01M 8C1F	PH H2O 1:1 8C1F
81 102	1		5.5	0.7	1.4			14.8	4	2		100	7					7.9	7.9	8.4
81 103	2		6.3	1.2	1.2			14.5	6	4		100	6					7.9	7.9	8.3
81 104	3		6.1	1.6	1.2			13.0	9	6		100	6					8.0	8.0	8.5
81 105	4		6.1	1.8	1.4			12.9	11	8		100	7					8.0	8.1	8.6
81 106	5		6.0	2.0	1.5			13.9	13	10		100	5					8.1	8.0	8.9
81 107	6		5.1	2.0	1.5			11.1	15	12		100	2	Z100				8.2	8.0	8.9
81 108	7		5.0	1.9	1.4			9.9	15	12		100	4					8.2	8.0	8.9
81 109	8		5.0	2.0	1.5			10.1	15	11		100	5					8.2	8.0	8.7
81 110	9		5.9	2.3	1.4			10.3	17	14		100	9					8.2	8.1	8.8
81 111	10		10.3	3.8	1.5			12.5	26	22		100	16					8.3	8.1	9.0

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE - CA 6A1B <- MEQ / LITER	WATER EXTRACTED FROM SATURATED PASTE - MG 6D1B	WATER EXTRACTED FROM SATURATED PASTE - NA 6P1B	WATER EXTRACTED FROM SATURATED PASTE - K 6Q1B	WATER EXTRACTED FROM SATURATED PASTE - CO3 6I1B	WATER EXTRACTED FROM SATURATED PASTE - HCO3 6J1B	WATER EXTRACTED FROM SATURATED PASTE - CL 6K1C	WATER EXTRACTED FROM SATURATED PASTE - SO4 6L1C	WATER EXTRACTED FROM SATURATED PASTE - NO3 6M1C	WATER EXTRACTED FROM SATURATED PASTE - H2O 8A <- PCT ->	TOTAL SALTS EST. 8A3A 8D5	ELEC. COND. MMHOS /CM	MINERALOGY - CLAY - X-RAY <- RELATIVE AMOUNTS -> 7A2I	MINERALOGY - CLAY - X-RAY 7A2I	MINERALOGY - CLAY - X-RAY 7A2I	MINERALOGY - CLAY - X-RAY 7A2I	MINERALOGY - DTA - <2U 7A3	MINERALOGY - DTA - <2U 7A3	TOT ANL 7C3 CLAY <2U K2O 6Q3A <- PCT	TOT ANL 7C3 CLAY <2U Fe 6C7A <- PCT
81 102	1	3.2	1.5	3.7	0.4	--	4.3	0.8	1.5	1.6	34.9	TR	0.87								
81 103	2	5.8	3.3	9.2	0.4	--	3.0	5.4	6.6	4.1	34.5	TR	1.03	MI 3	MI 2	KK 1	CA 1	KK 8			3.2	4.7
81 104	3	3.6	2.3	10.2	0.3	--	2.9	2.2	9.9	1.0	36.5	TR	1.02									
81 105	4	2.2	1.5	10.4	0.3	--	2.9	3.2	6.8	0.9	36.8	TR	1.08	MI 3	MI 2	KK 2	CA 1	KK 4			3.6	4.9
81 106	5	1.0	0.6	9.1	0.3	--	3.3	1.5	5.1	0.4	33.7	TR	1.17									
81 107	6	0.8	0.6	9.7	0.3	--	4.4	1.3	5.5	0.4	30.8	TR	1.21									
81 108	7	1.0	0.6	11.0	0.4	--	3.0	1.6	7.0	0.5	32.6	TR	1.37	MI 3	KK 2	MI 1		KK 8			3.7	5.3
81 109	8	1.1	1.0	11.7	0.4	--	2.9	2.9	6.8	0.7	34.6	TR	1.49									
81 110	9	0.8	0.8	12.2	0.4	--	3.1	4.5	4.5	0.9	37.9	TR	1.49	MI 3	KK 2	MI 1	VR 1	KK 7			3.6	5.4
81 111	10	0.3	0.3	12.0	0.3	--	4.0	5.1	2.6	0.0	47.3	TR	1.38									

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: SE ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE CA CALCITE VR VERMICULITE

- RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Avondale Variant.

Pedon Number: S80AZ-021-2

Classification: Fine-loamy, mixed, hyperthermic Typic Camborthids.

Location: Maricopa County, Arizona: 574 meters east and 208 meters south of the NW corner of Sec. 30, T.1N., R.4E. Site is in the center of plot 2C of R. D. Jackson's 1979 and 1980 wheat study.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Loamy alluvium from igneous rocks, quartzite and limestone.

Region: Central Arizona Basin and Range - MLRA 40.

Position: Low terrace in valley.

Elevation: About 336 meters.

Drainage and Permeability: Well drained, moderate permeability.

Water Table and Duration: None.

Slope: Less than 0.2 percent.

Sampled and Described By: Larry F. Ratliff Date: 10-7-80

Ap -- 0 to 15 cm.; dark reddish brown (5YR3/3) loam; reddish brown (5YR5/3) dry; weak fine granular structure; hard, friable; many fine and very fine roots; strong effervescence, moderately alkaline; clear smooth boundary. (810102).

A12 -- 15 to 33 cm.; dark reddish brown (5YR3/3) loam, reddish brown (5YR5/3) dry; weak fine subangular blocky structure; hard, friable; common fine and very fine roots; few fine pores; strong effervescence, moderately alkaline; gradual wavy boundary. (810103).

B21 -- 33 to 89 cm.; reddish brown (5YR4/4) loam, light reddish brown (5YR6/4) dry; weak fine subangular blocky structure; hard, friable; common fine and very fine roots; common fine and medium pores, few coarse pores, few threads of white CaCO3; strong effervescence, strongly alkaline; gradual wavy boundary. (810104, 105, 106).

B22 -- 89 to 158 cm.; yellowish red (5YR4/6) fine sandy loam, light reddish brown (5YR6/4) dry; massive; hard, very friable; few fine and very fine roots; common fine and medium pores, few coarse pores; about 5 percent by volume of coarse fragments less than 1 cm. in diameter; few threads of white CaCO3; strong effervescence, strongly alkaline; gradual wavy boundary. (810107, 108, 109).

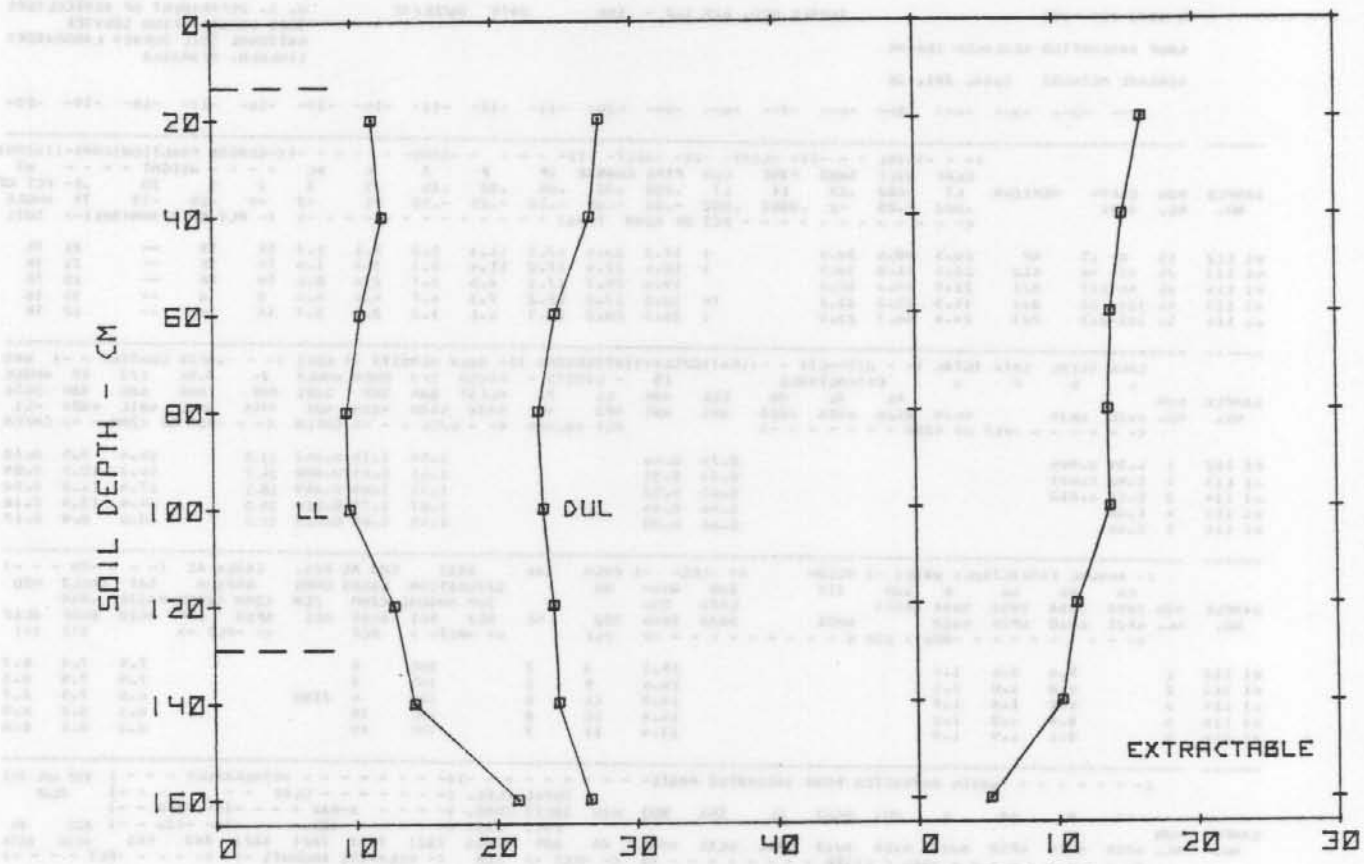
B23 -- 158 to 213 cm.; reddish brown (5YR5/4) loam, light reddish brown (5YR6/4) dry; weak medium subangular blocky structure; hard, very friable; common fine and medium pores; horizon is slightly compact in place and contains a few brittle bodies that appear to be highly weathered coarse fragments; about 5 to 10 percent by volume of threads of white CaCO3; violent effervescence, strongly alkaline. (810110, 111).

Remarks: Structure is weakly expressed but observation of core samples indicate natural cleavage planes. There are three open pits in adjacent plots. The B23 horizon has a mottled appearance because of carbonate accumulations and/or gravel. This horizon is the most restrictive to water movement. There are common fine flakes of mica throughout the profile.

Field Measured Soil Water Data Contributed By: R. D. Jackson, USDA-AR, U.S. Water Conservation Laboratory Phoenix, AZ.

Pedon Number: S80AZ-021-2

FIELD MEASURED SOIL WATER LIMITS



AVONDALE VARIANT-MARICOPA CO.,AZ.-WHEAT-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
20	11.4	27.6	16.2
40	12.1	26.9	14.8
60	10.5	24.4	13.9
80	9.5	23.2	13.7
100	9.7	23.5	13.8
120	12.8	24.2	11.4
140	14.2	24.5	10.3
160	21.5	26.7	5.2

TOTAL WATER EXTRACTED FROM PROFILE = 21.5 Cm.

AVONDALE V

CLASSIFICATION: FINE-LOAMY, MIXED, HYPERTHERMIC TYPIC CAMBORTHID

S 80AZ-021 -003 SAMPLE NOS. 81P 112 - 116 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEARCH

GENERAL METHODS 1C1A, 2A1, 2B

-1- -2- -3- -4- -5- -6- -7- -8- -9- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND -2	CLAY FINE .0002	CLAY CO3 .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF -.10	SAND F -.25	SAND M -.50	SAND C -1	SAND VC -2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	75-.1	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
81 112	1S	0- 15	AP	20.5	40.6	38.9		1	17.2	23.4	17.5	11.3	5.3	3.1	1.7	TR	TR	--	21	TR
81 113	2S	15- 46	A12	20.5	41.0	38.5		1	18.4	22.6	17.0	11.4	5.3	3.4	1.4	TR	TR	--	21	TR
81 114	3S	46-127	B21	22.9	44.3	32.8			19.6	24.7	17.3	8.6	3.7	2.6	0.6	TR	TR	--	15	TR
81 115	4S	127-152	B22	31.5	35.2	33.3		TR	18.0	17.2	12.2	7.3	4.7	4.6	4.5	8	8	--	34	16
81 116	5S	152-203	B23	24.4	46.7	28.9		1	20.5	20.2	11.5	6.1	3.2	2.4	0.7	TR	TR	--	12	TR

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6K3A	EXTRACTABLE FE 6G2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6G2A	CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS LL 4F1	ATTERBERG LIMITS PI 4F	FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B2A	WATER CONTENT 15 BAR 4C1	WRD WHOLE SOIL CM/CM
		<- PCT OF <2MM ->								PCT <0.4MM			<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
81 112	1	0.55	0.064						0.74	0.46			1.51	1.71	0.042	13.8		10.4	9.5	0.10	
81 113	2	0.42	0.053						0.71	0.51			1.61	1.65	0.008	14.7		10.3	10.5	0.09	
81 114	3	0.09	0.010						0.65	0.52			1.51	1.60	0.019	16.1		17.4	11.8	0.08	
81 115	4	0.06							0.46	0.44			1.67	1.75	0.014	19.0		24.4	13.9	0.16	
81 116	5	0.06							0.46	0.30			1.55	1.64	0.019	17.2		20.0	8.9	0.17	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6A2G	NA 5B5A 6P2B	K 5B5A 6A2B	SUM BASES	ACIDITY 6H5A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM SC3	BASE SATURATION NH4OAC SC1	CO3 AS CACO3 <2MM 6E1G	RES. /CM 8E1	CASO4 AS GYPSUM <2MM 6F1A	CASO4 AS GYPSUM <20MM 6F4	PH SAT PASTE 8C1B	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- MEQ / 100 G ->								PCT		<- PCT ->		PCT		<- PCT ->			1:2	1:1
81 112	1		5.8	0.6	1.4			15.1		3	2	100		6				7.9	7.9	8.3
81 113	2		6.0	1.0	1.1			14.6		5	3	100		5				7.9	7.9	8.5
81 114	3		6.5	1.8	1.7			14.9		11	8	100		4	2100			8.0	7.9	8.7
81 115	4		8.4	2.0	2.1			14.4		11	8	100		18				8.1	8.2	8.5
81 116	5		9.1	1.9	1.9			13.4		11	7	100		19				8.2	8.1	8.6

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6G1B	NA 6P1B	K 6W1B	CO3 6J1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A3A MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 603A	TOT ANL 7C3 CLAY Fe 6C7A
		<- MEQ / LITER ->									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->					<- PCT ->	
81 112	1	3.5	1.5	3.1	0.4	--	3.8	1.4	1.6	1.3	37.6	TR	0.87							
81 113	2	4.7	1.5	3.0	0.2	--	3.1	2.6	2.2	1.4	37.0	TR	1.00	MI 3	MI 2	KK 1	CA 1	KK 6	2.9	4.7
81 114	3	6.9	0.6	6.8	0.2	--	3.2	1.6	2.5	0.7	37.5	TR	0.89							
81 115	4	6.9	1.2	7.7	0.5	--	2.7	1.1	4.9	1.1	56.7	TR	1.10	MI 4	KK 2	MI 1	CA 1	KK 8	3.6	5.3
81 116	5	6.9	1.3	7.8	0.5	--	3.1	1.0	5.0	1.8	58.9	TR	1.11							

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Avondale Variant.

Pedon Number: S80AZ-021-3

Classification: Fine-loamy, mixed, hyperthermic Typic Camborthids.

Location: Maricopa County, Arizona: 569 meters east and 193 meters south of the NW corner of Sec. 30, T.1N., R.4E. Site is in the center of plot 1B of R. D. Jackson's 1979 and 1980 wheat study.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Loamy alluvium from igneous rocks, quartzite and limestone.

Region: Central Arizona Basin and Range - MLRA 40.

Position: Low terrace in valley.

Elevation: About 336 meters.

Drainage and Permeability: Well drained, moderate permeability.

Water Table and Duration: None.

Slope: Less than 0.2 percent.

Sampled and Described By: Larry F. Ratliff Date: 10-7-80

Ap -- 0 to 15 cm.; dark reddish brown (5YR3/4) loam, reddish brown (5YR5/4) dry; weak fine granular structure; hard, very friable; many fine and very fine roots; strong effervescence, moderately alkaline; clear smooth boundary. (810112).

A12 -- 15 to 46 cm.; dark reddish brown (5YR3/4) loam, reddish brown (5YR5/4) dry; weak medium subangular blocky structure; hard, friable; common fine and very fine roots; few fine pores; strong effervescence, strongly alkaline; gradual wavy boundary. (810113).

B21 -- 46 to 127 cm.; reddish brown (5YR4/4) loam, light reddish brown (5YR6/4) dry; weak fine and medium subangular blocky structure; hard, friable; common fine roots; common fine pores, few medium and coarse pores; few threads of pale brown CaCO3; percent sand gradually increases with depth; strong effervescence, strongly alkaline; gradual wavy boundary. (810114).

B22 -- 127 to 152 cm.; reddish brown (5YR4/4) clay loam, light reddish brown (5YR6/4) dry; massive; hard, friable; few fine roots; common fine pores; 15 percent by volume coarse fragments less than 15 mm. in diameter; violent effervescence, strongly alkaline; clear wavy boundary. (810115).

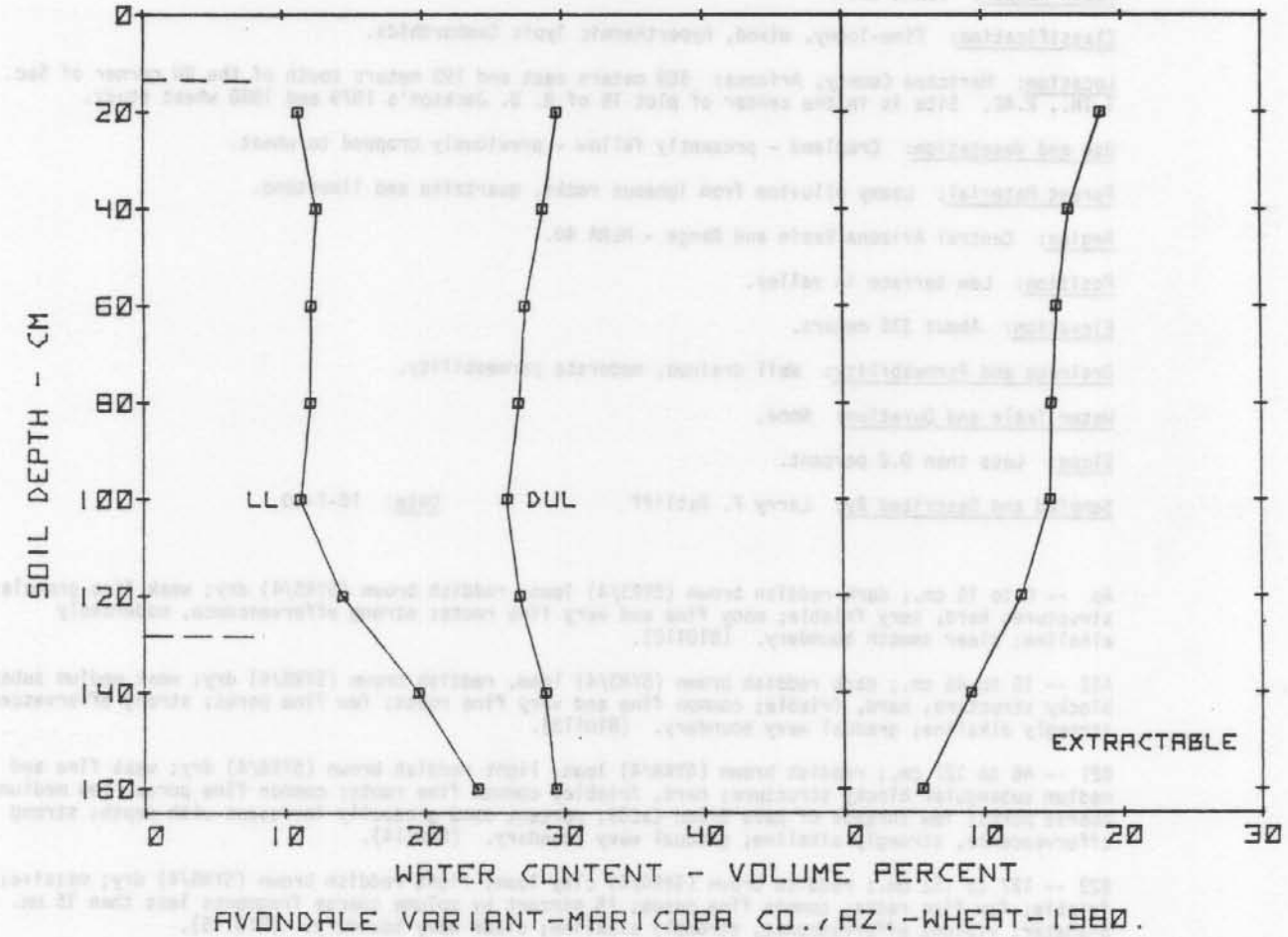
B23 -- 152 to 203 cm.; reddish brown (5YR4/4) clay loam, light reddish brown (5YR6/4) dry; weak fine subangular blocky structure; hard, firm; common fine and medium pores; horizon is compact in place and has a few brittle bodies that appear to be highly weathered coarse fragments; about 5 to 10 percent by volume soft masses and threads of CaCO3; violent effervescence, strongly alkaline. (810116).

Remarks: Structure is poorly expressed. Core samples were collected at about the middle one third of each horizon. Common very fine flakes of mica throughout the profile.

Field Measured Soil Water Data Contributed By: R. D. Jackson, USDA-AR, U.S. Water Conservation Laboratory, Phoenix, AZ.

Pedon Number: S80AZ-021-3

FIELD MEASURED SOIL WATER LIMITS

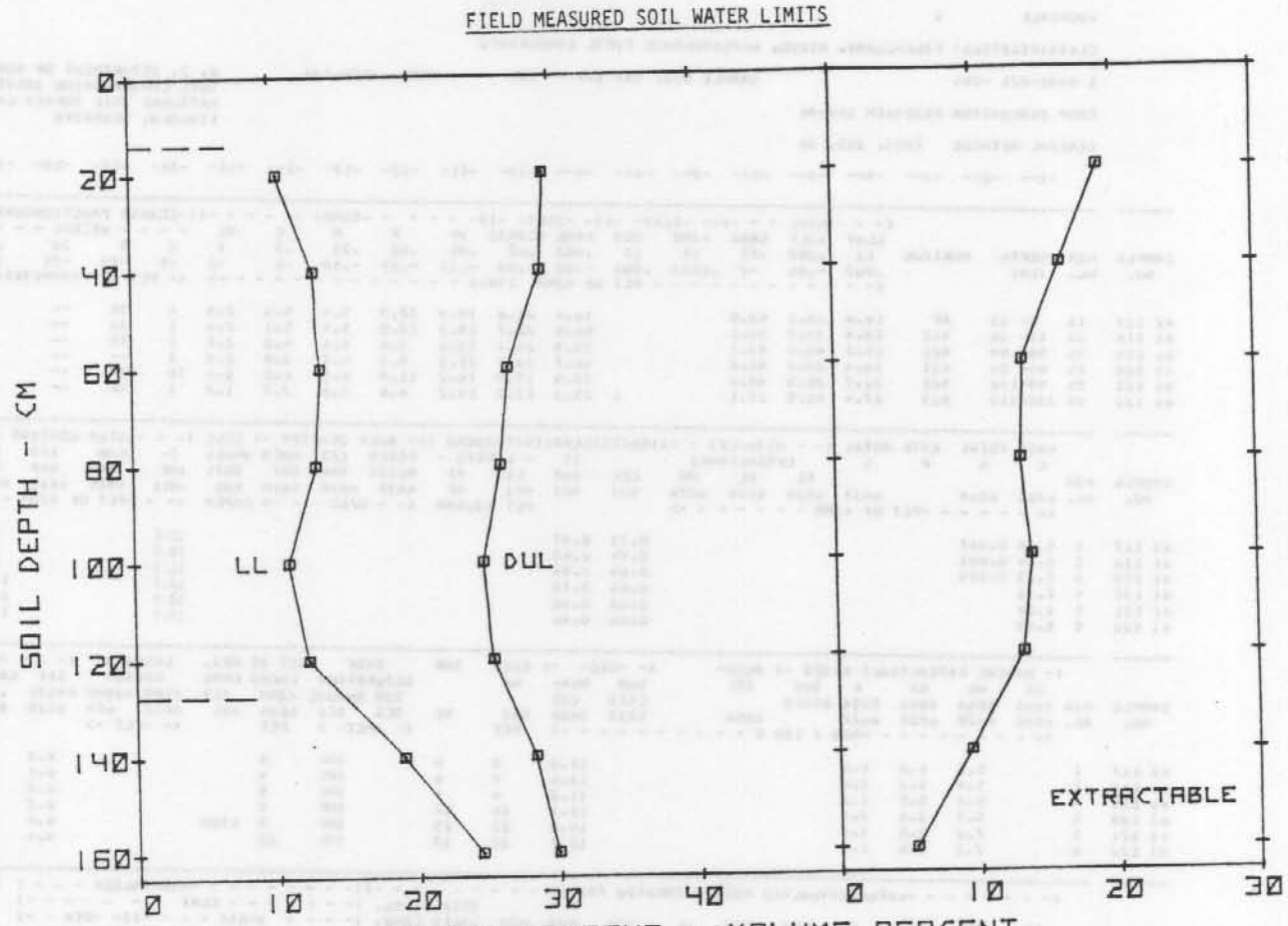


AVONDALE VARIANT-MARICOPA CO.,AZ.-WHEAT-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
20	11.1	29.6	18.5
40	12.4	28.6	16.2
60	12.0	27.3	15.3
80	11.9	26.8	14.9
100	11.2	26.0	14.8
120	14.2	26.9	12.7
140	19.6	28.7	9.1
160	23.8	29.4	5.6

TOTAL WATER EXTRACTED FROM PROFILE = 23.3 Cm.

Pedon Number: S80AZ-021-3



AVONDALE VARIANT-MARICOPA CO.,AZ.-BARLEY-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
20	10.5	29.5	19.0
40	13.0	29.2	16.2
60	13.4	26.8	13.4
80	13.0	26.2	13.2
100	11.0	24.9	13.9
120	12.3	25.5	13.2
140	19.0	28.4	9.4
160	24.5	29.9	5.4

TOTAL WATER EXTRACTED FROM PROFILE = 22.6 Cm.

AVONDALE V

CLASSIFICATION: FINE-LOAMY, MIXED, HYPERTHERMIC TYPIC CAMBORTHID

S 80AZ-021 -004 SAMPLE NOS. 81P 117 - 122 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEA-AR

GENERAL METHODS 1B1a, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT <.002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .002	CO3 CLAY LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGS 2-5	COARSE FRAGS 5-20	COARSE FRAGS 20-75	COARSE FRAGS 75-.1-	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 117	1S	0- 15	AP	18.8	38.2	43.0			16.4	21.8	19.9	10.3	5.4	4.6	2.8	1	TR	--	24	1
81 118	2S	15- 36	A12	18.4	39.5	42.1			16.8	22.7	19.3	10.0	5.1	5.1	2.6	1	TR	--	24	1
81 119	3S	53- 69	B21	16.3	40.0	43.7			15.9	24.1	23.6	9.6	4.4	4.0	2.1	1	TR	--	21	1
81 120	4S	69- 89	B21	18.4	39.8	41.8			16.7	23.1	21.8	9.5	4.7	3.8	2.0	1	--	--	21	1
81 121	5S	99-130	B22	30.7	26.5	42.8			10.6	15.9	16.2	11.9	6.9	6.2	1.6	TR	TR	--	27	TR
81 122	6S	130-183	B23	27.4	45.5	27.1	1	23.3	22.2	14.2	6.4	2.8	2.7	1.0	1	TR	--	14	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8A1	RATIO/CLAY 15 BAR 8D1	ATTERBERG - LIMITS - LL 4F1	ATTERBERG - LIMITS - PI 4F	BULK DENSITY - FIELD MOIST 4A3A	BULK DENSITY - 1/3 BAR 4A1D	BULK DENSITY - OVEN DRY 4A1H	COLE WHOLE SOIL 4U1	WATER CONTENT - 2- 0.2 BAR 4B1A	WATER CONTENT - 0.06 BAR 4B1C	WATER CONTENT - 1/3 BAR 4B1C	WATER CONTENT - 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 117	1	C.48	C.057						0.71	0.47							12.6			8.8	
81 118	2	C.44	C.051						0.74	0.43							12.8			7.9	
81 119	3	C.13	C.028						0.69	0.54							11.3			8.8	
81 120	4	C.11							0.64	0.70							12.7			12.8	
81 121	5	C.08							0.48	0.40							18.7			12.2	
81 122	6	C.08							0.46	0.46							18.7			12.7	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5B5A 6A2E	MG 5B5A 6D2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES 6H2B	ACIDITY 6H5A	CEC - SUM CATS 5A3A	CEC - NH4-OAC 5A8B	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	GASC4 AS GYPSUM <2MM 6F1A	GASC4 AS GYPSUM <20MM 6F4	PH SAT PASTE 8C1B	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - -MEQ / 100 G - - - - - - - - - ->								PCT		<- -PCT- >		PCT		<- -PCT ->				
81 117	1		5.3	1.3	1.6			13.3	8	6		100		4				8.2	7.9	8.6
81 118	2		5.4	1.3	1.8			13.6	8	6		100		4				8.1	7.9	8.6
81 119	3		5.4	0.9	1.3			11.2	6	4		100		5				8.0	7.9	8.4
81 120	4		5.7	2.6	0.9			11.7	16	12		100		5	1700			8.2	8.0	8.7
81 121	5		7.0	3.5	1.4			14.6	22	15		100		5				8.4	8.2	9.1
81 122	6		7.2	3.0	1.1			12.7	22	17		100		22				8.4	8.1	8.9

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE - CA 6A1B	MG 6A1E	NA 6P1B	K 6Q1B	CO3 6J1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A3A MMHOS /CM	MINERALOGY - CLAY - X-RAY <2U 7A2I	MINERALOGY - CLAY - X-RAY <2U 7A2I	MINERALOGY - CLAY - X-RAY <2U 7A2I	MINERALOGY - CLAY - DTA <2U 7A3	MINERALOGY - CLAY - DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- - - - - - - - - -MEQ / LITER - - - - - - - - - ->									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->			<- - - - -PCT - - - ->			
81 117	1	1.9	1.1	7.0	0.5	--	5.7	2.3	2.6	--	32.2	TR	1.08						3.9	4.6
81 118	2	1.4	0.8	6.7	0.5	--	4.5	1.9	2.2	0.3	31.9	TR	0.92	MI 3	MI 2	KK 1	CA 1	KK 6		
81 119	3	3.5	3.0	6.8	0.5	--	2.6	6.2	4.6	0.4	30.9	TR	1.43						3.4	4.8
81 120	4	2.0	1.6	16.6	0.2	--	2.4	12.7	6.0	1.6	41.1	0.1	2.22	MI 3	KK 2	MI 1	CA 1	KK 6		
81 121	5	6.4	6.3	9.0	0.2	--	4.4	1.9	2.6	1.0	40.7	TR	1.02						3.1	4.8
81 122	6	6.6	0.8	14.3	0.2	--	3.2	3.8	6.6	2.1	55.6	0.1	1.67	MI 3	KK 2	MI 2	VR 1	KK 7		

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE CA CALCITE VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Avondale Variant.

Pedon Number: S80AZ-021-4

Classification: Fine-loamy, mixed, hyperthemic Typic Camborthids.

Location: Maricopa County, Arizona: 416 meters east and 772 meters south of the NW corner of Sec. 30, T.1N., R.4E. Site is in the center of plot F1 of field C3, Gene Guinn 1980 cotton study.

Use and Vegetation: Cropland - presently in cotton.

Parent Material: Loamy alluvium from igneous rocks, quartzite and limestone.

Region: Central Arizona Basin and Range - MLRA 40.

Position: Low terrace in valley.

Elevation: About 336 meters.

Drainage and Permeability: Well drained, moderate permeability.

Water Table and Duration: None.

Slope: Less than 0.1 percent.

Sampled and Described By: Larry F. Ratliff Date: 10-9-80

Ap -- 0 to 15 cm.; dark reddish brown (5YR3/4) loam, light reddish brown (5YR6/4) dry; massive; hard, friable; common fine and medium roots; strong effervescence, strongly alkaline; clear smooth boundary. (810117).

A12 -- 15 to 35 cm.; dark reddish brown (5YR3/4) loam, reddish brown (5YR5/4) dry; massive, hard, friable; common fine and medium roots; common fine and medium pores; common wormcasts; strong effervescence, strongly alkaline; gradual wavy boundary. (810118).

B21 -- 35 to 99 cm.; reddish brown (5YR4/4) loam, light reddish brown (5YR5/4) dry; weak fine and medium subangular blocky structure; hard, friable; common fine and medium roots; common fine and medium pores, few coarse pores; common wormcasts in the upper part; few fine threads of white $CaCO_3$; strong effervescence, strongly alkaline; gradual wavy boundary. (810119, 120).

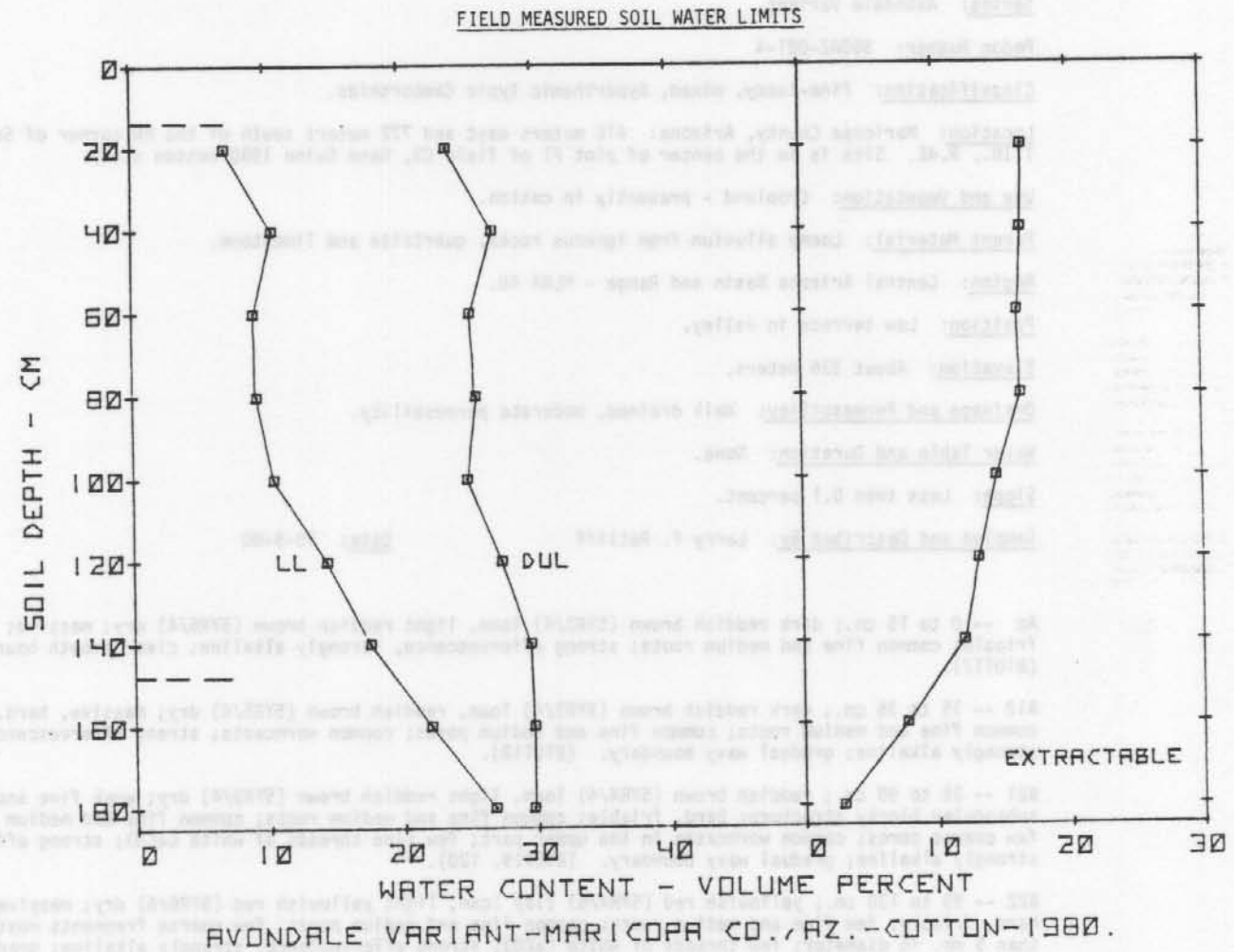
B22 -- 99 to 130 cm.; yellowish red (5YR4/6) clay loam, light yellowish red (5YR6/6) dry; massive; very hard, friable; few fine and medium roots; common fine and medium pores; few coarse fragments mostly less than 5 mm. in diameter; few threads of white $CaCO_3$; strong effervescence, strongly alkaline; gradual wavy boundary. (810121).

B23 -- 130 to 185 cm.; reddish brown (5YR4/4) light clay loam, light reddish brown (5YR6/4) dry; massive; hard, friable; few fine roots and pores; estimated 10 percent by volume white and pale brown $CaCO_3$; violent effervescence, strongly alkaline. (810122).

Remarks: Soil was extremely dry in the upper 100 cm. and core samples were not collected.

Field Measured Soil Water Contributed By: G. Guinn, Cotton Research Station, Phoenix, Arizona.

Pedon Number: S80AZ-021-4



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
20	7.0	23.6	16.6
40	10.5	27.0	16.5
60	9.1	25.3	16.2
80	9.3	25.7	16.4
100	10.5	25.0	14.5
120	14.4	27.5	13.1
140	17.6	29.6	12.0
160	22.1	29.8	7.7
180	26.8	29.7	2.9

TOTAL WATER EXTRACTED FROM PROFILE = 24.8 Cm.

BETHANY

CLASSIFICATION: FINE, MIXED, THERMIC PACHIC PALEUSTOLL

S 80CK-017 -001 SAMPLE NOS. 81P 895 - 899 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1a1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	CLAY COS LT .002 -.002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	5 -20	20 -75	>2MM .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 895	1S	0- 28	A1	22.0	60.5	17.5			16.9	43.6	14.5	1.8	0.7	0.4	0.1	--	--	--	3	--
81 896	2S	28- 46	B1	26.8	56.7	16.5			15.9	42.8	11.9	1.6	0.8	0.2	0.2	--	--	--	3	--
81 897	3S	46- 89	B21T	36.1	52.3	11.6			19.3	33.0	8.6	2.0	0.5	0.3	0.2	--	--	--	3	--
81 898	4S	89-114	B22T	37.1	48.4	14.5			15.4	33.0	9.9	2.2	0.9	0.7	0.8	1	1	--	7	2
81 899	5S	114-152	B23T	44.2	40.7	15.1			14.6	26.1	9.4	2.6	1.1	1.1	0.9	TR	1	--	7	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	EXTRACTABLE FE 6G2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 8O1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4O1	WATER CONTENT 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 895	1	2.11	0.17e						0.74	0.46				1.30	1.40	0.025	14.7		19.0	10.1	0.12
81 896	2	1.26	0.10e						0.69	0.43				1.33	1.47	0.034	16.8	26.8	22.1	11.5	0.14
81 897	3	0.64	0.05S						0.71	0.41				1.43	1.83	0.086	21.4	28.9	26.3	14.7	0.17
81 898	4	0.35							0.65	0.40				1.52	1.91	0.078	21.1	27.9	25.1	14.8	0.15
81 899	5	0.19							0.62	0.39				1.52	1.98	0.091	24.4		25.7	17.1	0.13

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6Q2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->											<- - - - -PCT - - - ->					1:2	1:1
81 895	1	11.5	3.7	TR	0.8	16.0	4.7		20.7	16.2			77	99				5.5	5.9
81 896	2	11.6	5.3	0.1	0.5	17.5	3.8		21.3	18.5			82	95				5.7	6.2
81 897	3	14.9	8.9	0.4	0.8	24.8	2.5		27.3	25.7			91	96				6.2	7.1
81 898	4		9.7	0.7	0.6		--			24.2			100	100	3			7.6	8.4
81 899	5		12.8	2.4	0.6		--			27.2			100	100	2			7.8	8.5

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DIA <2U 7A3	7A3	TOT ANL 7C3 CLAY K20 60JA	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 895	1	MT 3	KK 2	MT 2	CL 1	KK 9		2.6	5.3
81 896	2								
81 897	3	MT 3	MI 3	KK 2	QZ 2	KK 8		2.2	5.0
81 898	4								
81 899	5	MT 3	MI 3	KK 2	QZ 2	KK21		2.8	5.4

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE MT MONTMORILL CL CHLORITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Bethany.

Pedon Number: S80OK-017-1

Classification: Fine, mixed, thermic Pachic Paleustolls.

Location: Canadian County, Oklahoma: In the SE 1/4 of Sec. 4, T.12N., R.8W., of the Oklahoma State University Agriculture Experiment Station near El Reno. Site is 2 meters north of Tube 2, Watershed 2 of the Water Quality Research Study.

Use and Vegetation: Native rangeland - predominantly little bluestem with some sideoats grama, indiangrass switchgrass.

Parent Material: Presumed to be forming in residuum from red beds.

Region: Central Rolling Red Prairies - MLRA 80A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: About 3 percent. Slightly convex midslope.

Sampled and Described By: Larry F. Ratliff Date: 12-9-80

A1 -- 0 to 28 cm.; dark gray (10YR4/1) silt loam, very dark gray (10YR3/1) moist; weak fine granular structure; very hard, friable; many fine and medium roots; medium acid; gradual smooth boundary. (810895).

B1 -- 28 to 46 cm.; dark gray (10YR4/1) silty clay loam, very dark gray (10YR3/1) moist; moderate medium subangular blocky structure; very hard, friable; many fine and medium roots; few fine pores; thin patchy clay films on faces of peds; slightly acid; gradual wavy boundary. (810896).

B21t -- 46 to 89 cm.; dark grayish brown (10YR4/2) silty clay loam, very dark grayish brown (10YR3/2) moist; strong medium and coarse blocky structure; extremely hard, very firm; common fine roots mostly between vertical ped faces; few fine pores; thick almost continuous clay films on faces of peds; neutral; gradual wavy boundary. (810897).

B22t -- 89 to 114 cm.; brown (10YR5/3) silty clay loam, dark brown (10YR4/3) moist; common fine distinct yellowish red (5YR5/6, 5/8) mottles; moderate medium and coarse blocky structure; extremely hard, very firm; common fine roots between vertical ped faces; few fine pores; thick continuous clay films on faces of peds; few coarse fragments mostly less than 1 cm. diameter; estimated 2 to 3 percent by volume $CaCO_3$; matrix non-calcareous; moderately alkaline; gradual wavy boundary. (810898).

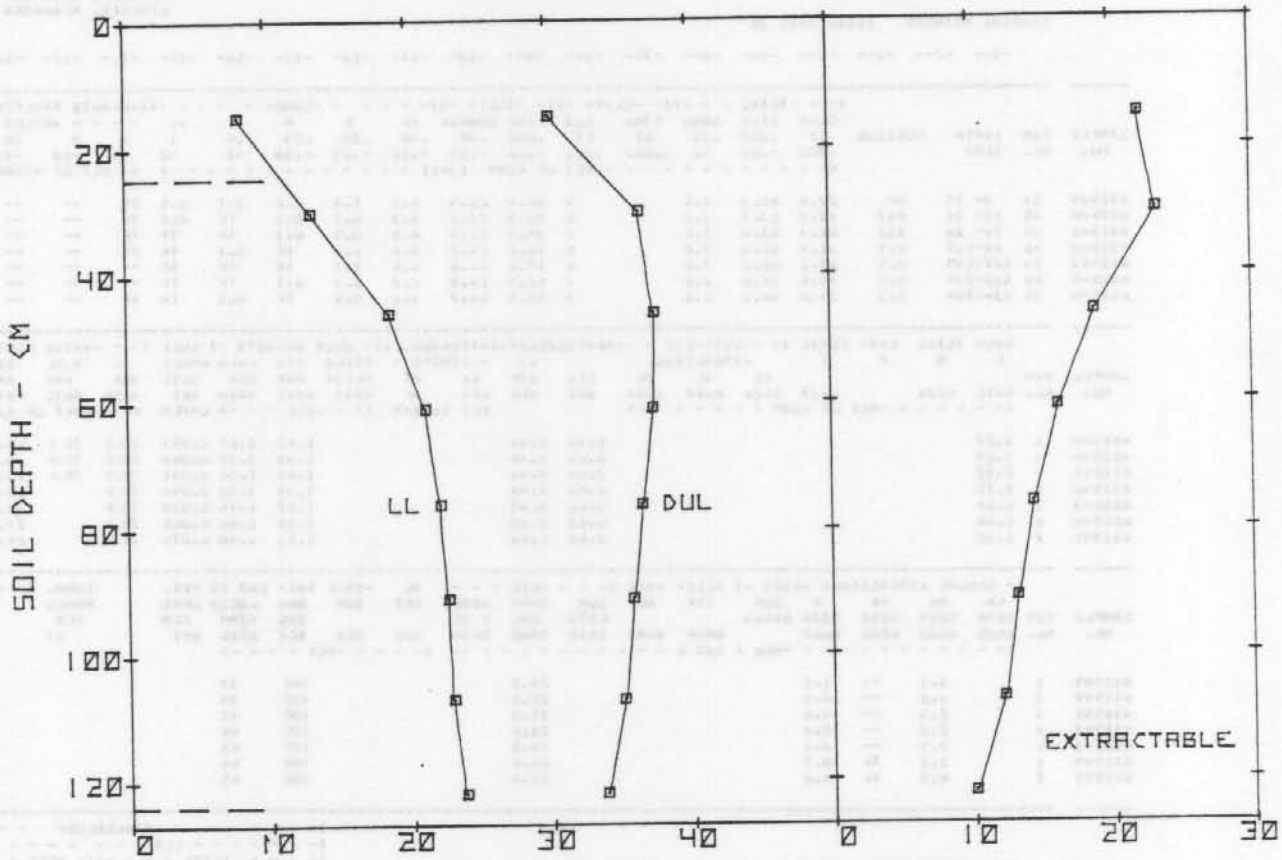
B23t -- 114 to 152 cm.; yellowish red (5YR5/6) silty clay, yellowish red (5YR4/6) moist; ped faces are reddish brown (5YR4/4) moist; moderate medium blocky structure; extremely hard, very firm; common fine roots between peds; few fine pores; thick continuous clay films on faces of peds; few coarse fragments mostly less than 2 cm. in diameter; strongly alkaline. (810899).

Remarks: Clay content of upper part of the argillic horizon is slightly less clayey than typical of Bethany soils. Soil was moist to about 45 cm. and very dry below. Very difficult to obtain core samples for bulk density. Average Annual Rainfall about 75 cm.

Field Measured Soil Water Data Contributed By: R. G. Menzel and G. A. Coleman, USDA-AR, Southern Plains Watershed and Water Quality Laboratory, Durant and Chickasha, Oklahoma.

Pedon Number: S80OK-017-1

FIELD MEASURED SOIL WATER LIMITS



BETHANY SIL-CANADIAN CO./OK.-RANGELAND-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	8.1	30.2	22.1
30	13.2	36.5	23.3
46	18.7	37.5	18.8
61	21.2	37.3	16.1
76	22.2	36.5	14.3
91	22.7	35.8	13.1
107	23.0	35.1	12.1
122	23.8	33.8	10.0

TOTAL WATER EXTRACTED FROM PROFILE = 21.5 Cm.

BOSQUE I

CLASSIFICATION: FINE-SILTY, CARBONATIC, THERMIC CUMULIC HAPLUSTOLL

S 81TX-027 -002 SAMPLE NOS. 81P1589 - 1595 DATE 06/28/82

CROP EVALUATION STUDY

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS (MM) WEIGHT 2 -5	5 -20	20 -75	.1- 75	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)												<- PCT OF <75MM(3B1) ->				
811589	1S	0- 15	AP	29.6	61.9	8.5		4	35.4	25.5	6.2	1.9	0.2	0.1	0.1	TR	--	--	2	--
811590	2S	15- 51	A12	32.5	63.7	3.8		6	40.5	23.2	3.3	0.3	0.1	TR	0.1	TR	--	--	TR	--
811591	3S	51- 86	A12	31.9	63.0	5.1		5	39.5	23.5	4.5	0.5	0.1	TR	TR	TR	--	--	1	--
811592	4S	86-127	B21	31.4	62.8	5.8		6	38.1	24.7	5.1	0.6	TR	0.1	TR	TR	--	--	1	--
811593	5S	127-183	B21	32.2	60.2	7.6		6	37.6	22.6	6.6	1.0	TR	TR	TR	--	--	--	1	--
811594	6S	183-239	B22	39.6	57.8	2.6		7	42.9	14.9	2.2	0.3	0.1	TR	TR	--	--	--	1	--
811595	7S	239-304	B23	39.6	58.1	2.3		8	43.4	14.7	1.6	0.4	TR	0.1	TR	TR	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM			<- G/CC ->		CM/CM	<- PCT OF <2MM ->				CM/CM
811589	1	1.27							0.75	0.44				1.43	1.67	0.053	20.5	31.1	24.6	13.0	0.17
811590	2	1.05							0.69	0.46				1.38	1.57	0.044	22.6	31.0	25.6	14.9	0.15
811591	3	0.92							0.66	0.44				1.40	1.58	0.041	20.9	28.4	23.6	14.0	0.13
811592	4	0.75							0.62	0.44				1.39	1.58	0.044	20.6		23.3	13.7	0.13
811593	5	0.64							0.62	0.43				1.57	1.74	0.035	20.8		20.3	13.8	0.10
811594	6	0.64							0.62	0.40				1.55	1.88	0.066	23.4		23.2	15.7	0.12
811595	7	0.50							0.62	0.48				1.53	1.90	0.075	24.3		24.1	19.2	0.08

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2E	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	NH4-OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- MEQ / 100 G ->										<- PCT ->							
811589	1		3.1	--	1.1					23.5				100	33			7.9	8.3
811590	2		3.1	--	0.8					22.5				100	39			7.9	8.2
811591	3		2.9	--	0.6					21.0				100	41			7.8	8.2
811592	4		2.8	--	0.6					19.6				100	44			7.8	8.2
811593	5		3.5	--	0.6					19.8				100	43			7.9	8.3
811594	6		5.2	TR	0.7					24.4				100	44			7.8	9.3
811595	7		6.5	TR	0.8					24.4				100	45			7.9	8.4

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A21	7A21	7A21	7A21	DTA <2U 7A3	7A3	TOT ANL CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
811589	1								
811590	2								
811591	3								
811592	4	CA 3	MT 2	MI 1	KK 1	KK 8		1.3	2.5
811593	5								
811594	6								
811595	7								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL CA CALCITE MT MONTMORILL MI MICA KK KAOLINITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Bosque taxadjunct[1/].

Pedon Number: S81TX-027-2

Classification: Fine-silty, carbonatic thermic Cumulic Haplustolls.

Location: Bell County, Texas: 0.67 mile northwest on County Road 436 from its intersection with the Leon River, then 0.76 mile north-northeast on paved road to gate. Site is 0.63 mile east-southeast on field road and 10 meters south in cultivated field.

Use and Vegetation: Cropland - fallow when described - previously cropped to cotton.

Parent Material: Loamy and silty alluvium.

Region: Grand Prairie - MLRA 85.

Position: Flood plain - occasionally flooded.

Elevation: ----------

Drainage and Permeability: Well drained, moderate to moderately slowly permeable.

Water Table and Duration: None observed.

Slope: About 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 2-19-81

Ap - 0 to 15 cm.; very dark grayish brown (10YR3/2) silty clay loam; weak fine granular structure; hard, friable; few fine roots; few fine fragments of shell; strong effervescence, moderately alkaline; clear smooth boundary. (811589).

A12 - 15 to 86 cm.; very dark grayish brown (10YR3/2) silty clay loam; weak fine and medium subangular blocky structure; hard, friable; few fine and very fine roots; few fine and medium pores; few small fragments of shell; strong effervescence, moderately alkaline; gradual smooth boundary. (811590, 591).

B21 - 86 to 183 cm.; dark grayish brown (10YR4/2) silty clay loam; weak fine and medium subangular blocky structure; very hard, friable; few very fine roots; few fine and medium pores; few small fragments of shell; strong effervescence, moderately alkaline; gradual smooth boundary. (811592, 593).

B22 - 183 to 239 cm.; dark grayish brown (10YR4/2) light silty clay; weak fine and medium subangular blocky structure: very hard, friable; few fine and medium pores; few small fragments of shell; strong effervescence, moderately alkaline; gradual smooth boundary. (811594).

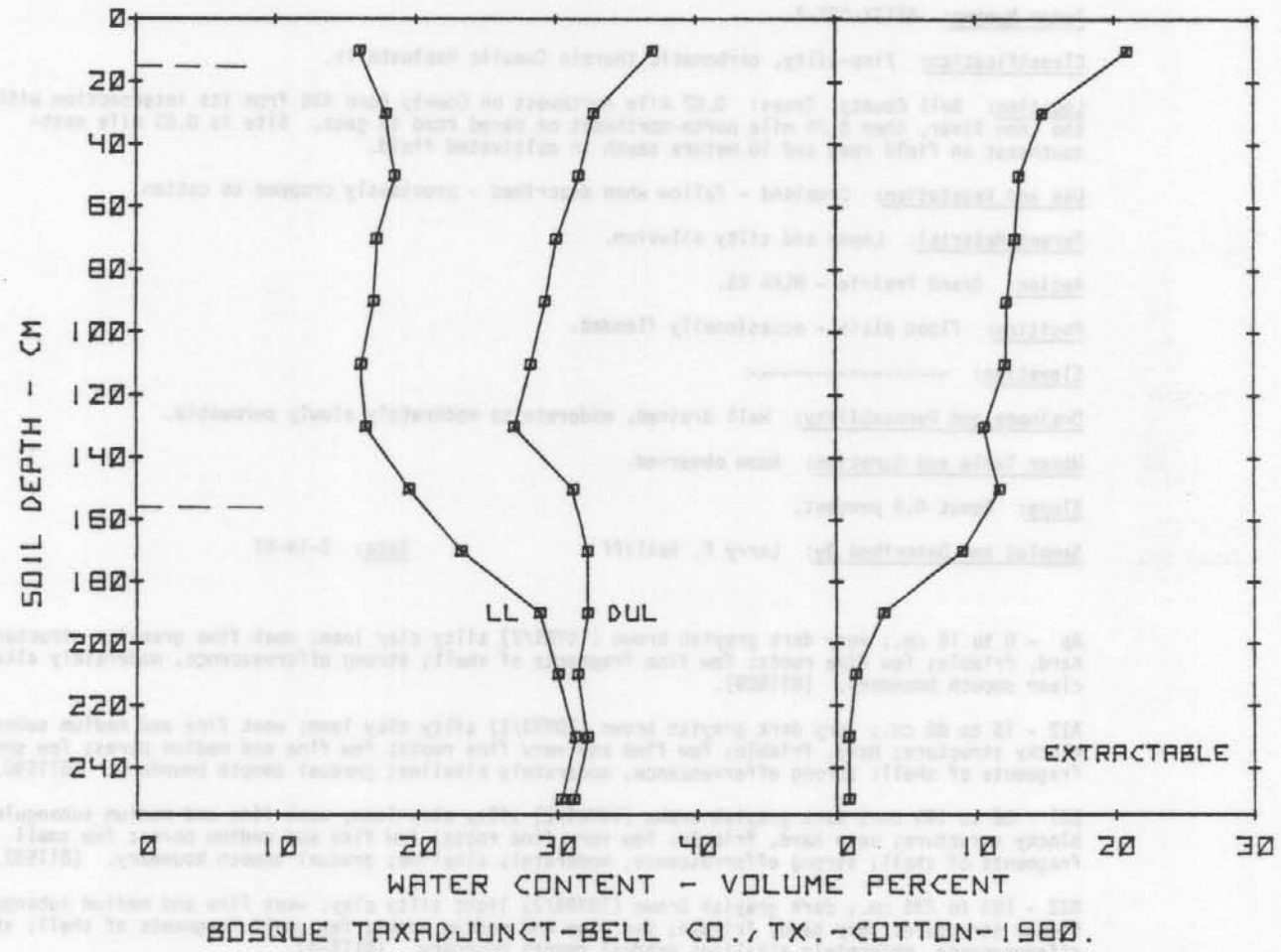
B23 - 239 to 304 cm.; grayish brown (10YR5/2) light silty clay; massive and compact in plact; extremely hard, firm; few fine pores; few very fine threads and filaments of $CaCO_3$; few small fragments of shell; strong effervescence, moderately alkaline. (811595).

Remarks: [1/]Differs from Bosque by having more silt and carbonates than typical. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S81TX-027-2

FIELD MEASURED SOIL WATER LIMITS



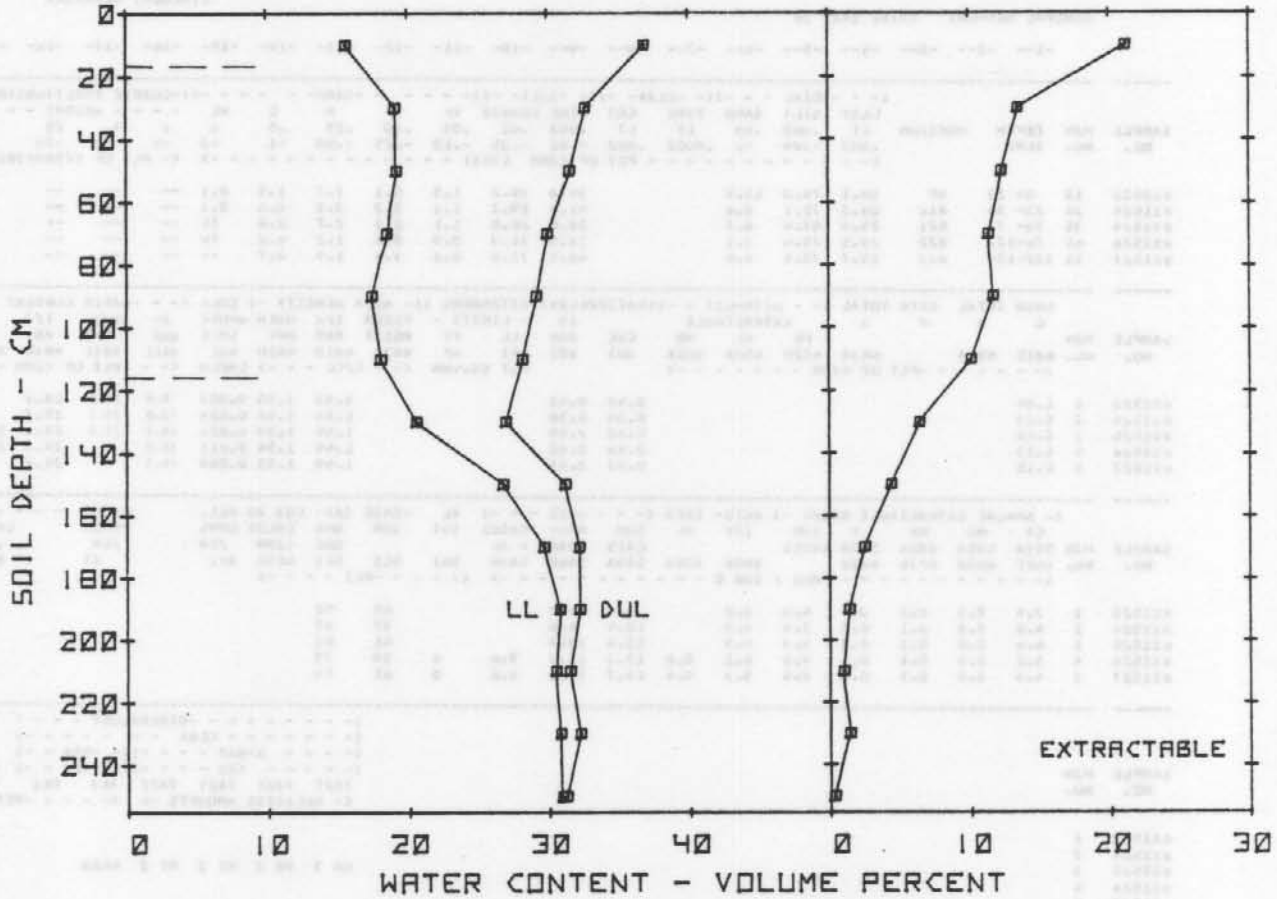
BOSQUE TAXADJUNCT-BELL CO., TX.-COTTON-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	16.0	36.9	20.9
30	17.9	32.7	14.8
50	18.5	31.6	13.1
70	17.2	30.0	12.8
90	17.0	29.2	12.2
110	16.1	28.2	12.1
130	16.4	27.0	10.6
150	19.5	31.2	11.7
170	23.2	32.2	9.0
190	28.8	32.2	3.4
210	30.1	31.5	1.4
230	31.3	32.2	0.9
250	30.3	31.2	0.9

TOTAL WATER EXTRACTED FROM PROFILE = 24.8 Cm.

Pedon Number: S81TX-027-2

FIELD MEASURED SOIL WATER LIMITS



BOSQUE TAXADJUNCT-BELL CO., TX.-CORN-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	15.7	36.9	21.2
30	19.2	32.7	13.5
50	19.3	31.6	12.3
70	18.6	30.0	11.4
90	17.5	29.2	11.7
110	18.1	28.2	10.1
130	20.6	27.0	6.4
150	26.8	31.2	4.4
170	29.7	32.2	2.5
190	30.8	32.2	1.4
210	30.5	31.5	1.0
230	30.8	32.2	1.4
250	30.9	31.2	0.3

TOTAL WATER EXTRACTED FROM PROFILE = 19.5 Cm.

CASCILLA T

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC DYSTRIC EUTROCHREPT

S 81TN-113 -001 SAMPLE NOS. 81P1523 - 1527 DATE 05/26/82

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS (MM) WEIGHT 2-5	WEIGHT 5-20	WEIGHT 20-75	WEIGHT .1-75	(>2MM) WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM(3B1)			->	
811523	1S	0- 23	AP	10.1	74.0	15.9			34.8	39.2	1.5	5.1	7.7	1.5	0.1	--	--	--	14	--
811524	2S	23- 38	A12	20.3	71.1	8.6			41.4	29.7	1.2	3.2	3.5	0.6	0.1	--	--	--	7	--
811525	3S	38- 76	B21	25.9	67.4	6.7			38.6	28.8	1.1	2.3	2.7	0.6	TR	--	--	--	6	--
811526	4S	76-122	B22	25.5	71.4	3.1			39.5	31.9	0.9	0.8	1.2	0.2	TR	--	--	--	2	--
811527	5S	122-155	B23	19.7	73.5	6.8			40.5	33.0	0.8	3.4	1.9	0.7	--	--	--	--	6	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	(RATIO/CLAY) CEC 8D1	15 BAR 8D1	(ATTERBERG LIMITS) LL 4F1	PI 4F	(BULK DENSITY) FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	(WATER CONTENT) 2-BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
811523	1	0.54							0.48	0.41				1.52	1.55	0.007	8.8	24.6	19.9	4.1	0.24
811524	2	0.23							0.34	0.36				1.55	1.57	0.004	13.0	23.7	19.7	7.3	0.19
811525	3	0.18							0.42	0.44				1.49	1.59	0.022	18.2	27.3	23.8	11.3	0.19
811526	4	0.15							0.48	0.42				1.49	1.54	0.011	18.9		24.3	10.8	0.20
811527	5	0.15							0.57	0.47				1.49	1.53	0.009	16.3		24.8	9.2	0.23

SAMPLE NO.	HZN NO.	(NH4OAC EXTRACTABLE BASES) CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	(CEC) SUM CATS 5A3A	NH4-OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	(BASE SAT) SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	(PH) CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- MEQ / 100 G									->	<- PCT			->				
811523	1	3.4	0.5	0.2	0.3	4.4	2.0		6.4	4.8			69	92				5.7	6.2
811524	2	4.8	0.8	0.1	0.2	5.9	4.5		10.4	6.8			57	87				5.5	6.1
811525	3	6.4	2.0	0.2	0.3	8.9	4.5		13.4	10.9			66	82				5.6	5.8
811526	4	5.2	3.4	0.1	0.3	9.0	6.2	0.6	15.2	12.3	9.6	6	59	73				4.7	5.2
811527	5	4.5	3.5	0.1	0.3	8.4	5.3	0.4	13.7	11.3	8.8	5	61	74				4.8	5.3

SAMPLE NO.	HZN NO.	(MINERALOGY - CLAY) X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DTA <2U 7A3	7A3	TOT ANL CLAY 7C3 K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS			->	<- PCT			->
811523	1								
811524	2								
811525	3	KK 3	VR 2	MI 2	MT 2	KK28		1.9	7.1
811526	4								
811527	5								

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 25 PCT .1-75MM 5

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL KK KAOLINITE VR VERMICULITE MI MICA MT MONTMORILL

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Cascilla taxadjunct[1/].

Pedon Number: S81TN-113-1

Classification: Fine-silty, mixed, thermic Dystric Eutrochrepts.

Location: Madison County, Tennessee: No legal description available. Site is on the West Tennessee Experiment Station in Jackson near the center of Bob Hays' 1980 Soybean Treatment Study.

Use and Vegetation: Cropland - presently fallow - previously cropped to soybeans.

Parent Material: Silty alluvium.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Low Terrace.

Elevation: ----------

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Durartion: None observed.

Slope: About 0.5 percent - plane surface.

Sampled and Described By: Larry F. Ratliff and D. Tyler Date: 3-1-81

Ap - 0 to 23 cm.; brown (7.5YR4/4) silt loam; weak fine and medium platy parting to weak fine subangular blocky structure; hard, very friable; common large voids and accumulations of partially decomposed organic residue; slightly acid; clear smooth boundary. (811523).

A12 - 23 to 38 cm.; brown (7.5YR4/4) silt loam; massive; weakly expressed plow pan; hard, friable; common fine roots and pores; few medium pores; few wormcasts and pockets of (10YR3/2) silt loam; slightly acid; clear smooth boundary. (811524).

B21 - 38 to 76 cm.; brown (7.5YR4/4) silt loam; few fine faint (7.5YR5/4) mottles; medium subangular blocky structure; hard, slightly firm; common fine roots and pores; few thin and patchy clay films on faces of peds; clay films are slightly darker in color than matrix; few black organic stains on faces of peds; few wormcasts; medium acid; gradual wavy boundary. (811525).

B22 - 76 to 122 cm.; brown (7.5YR5/4) silt loam; few fine faint light brown and pinkish gray mottles; weak fine and medium subangular blocky structure; hard, firm; few fine roots and pores; few dark brown coatings on faces of peds; strongly acid; diffuse wavy boundary. (811526).

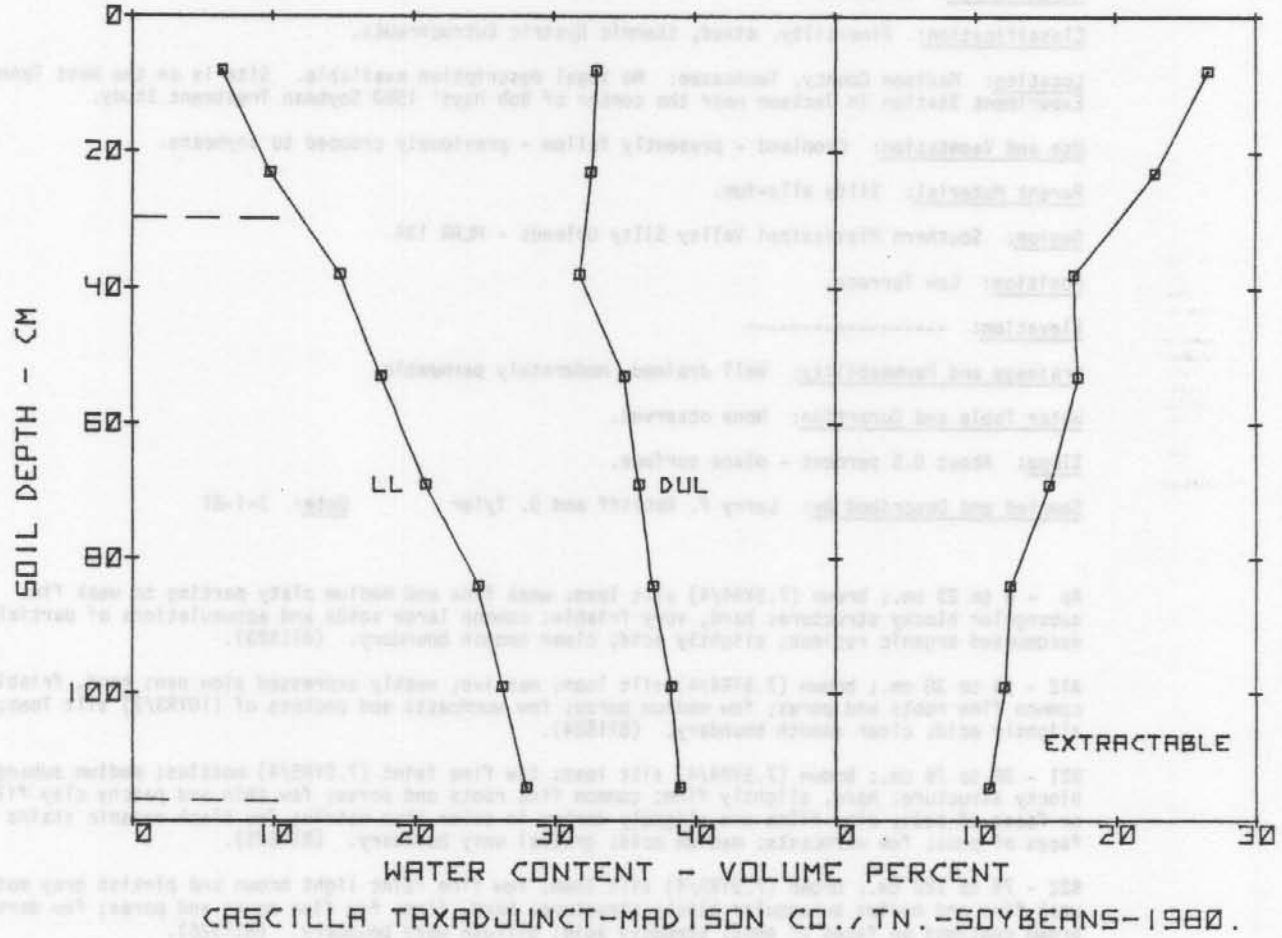
B23 - 122 to 155 cm.; brown (7.5YR5/4) silt loam; weak fine subangular blocky structure; hard, firm; few fine roots and pores; common light brown (7.5YR6/4) silt coatings on faces of peds; common dark brown coatings on faces of peds; strongly acid. (811527).

Remarks: [1/]Differs from Cascilla by having base saturation that is more than 60 percent at depths between 25 and 75 cm. below the soil surface. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: Don D. Tyler, West Tennessee Experiment Station, Jackson, Tennessee.

Pedon Number: S81TN-113-1

FIELD MEASURED SOIL WATER LIMITS



CASCILLA TAXADJUNCT-MADISON CO., TN.-SOYBEANS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	6.4	33.0	26.6
23	9.8	32.6	22.8
38	14.8	31.8	17.0
53	17.7	35.0	17.3
69	20.8	36.0	15.2
84	24.6	37.0	12.4
99	26.3	38.3	12.0
114	28.0	38.9	10.9

TOTAL WATER EXTRACTED FROM PROFILE = 20.4 Cm.

CATALPA

CLASSIFICATION: FINE, MONTMORILLONITIC, THERMIC FLUVAQUENTIC HAPLUDOLL

S 81MS-081 -003 SAMPLE NOS. 81P1508 - 1511 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE -.05 -.10	SAND VF -.25	SAND F -.50	SAND M -1	SAND C -2	SAND VC 1	COARSE FRACTIONS(MM) 2 5	5 20	>2MM WEIGHT .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->		
811508	1S	0- 13	AP	30.4	44.4	25.2			24.4	20.0	6.3	14.9	2.9	0.8	0.3	TR	--	--	19	--
811509	2S	13- 25	A12	30.2	43.5	26.3			24.7	18.8	6.4	15.1	3.7	0.8	0.3	TR	--	--	20	--
811510	3S	25- 51	B21	39.6	44.2	16.2			27.3	16.9	4.6	8.9	2.1	0.5	0.1	--	--	--	12	--
811511	4S	51-107	B22	44.7	44.5	10.8			29.1	15.4	3.6	6.2	1.4	0.2	TR	TR	--	--	8	TR

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	EXTR S	EXTRACTABLE FE 6A3A	EXTRACTABLE AL 6G2B	EXTRACTABLE MN 6G7A	DITH-CIT 6D2A	CEC 8D1	CEC 8AR 8D1	RATIO/CLAY LS	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->					CM/CM	<- - -PCT OF <2MM - ->				CM/CM
811508	1	2.15								0.91	0.44					1.50			18.9			13.4	
811509	2	1.74								0.90	0.43					1.54	1.82	0.057	18.7	25.0	22.9	13.1	0.15
811510	3	1.15								0.80	0.46					1.48	1.82	0.071	24.1	26.8	25.0	18.1	0.10
811511	4	0.71								0.68	0.41					1.51	1.85	0.070	24.4		24.7	18.1	0.10

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 6N2E	MG 6D2D	NA 6P2B	K 6Q2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS	CEC NH4- OAC	BASES + AL	AL SAT 5G1	BASE SAT SUM 5C3	BASE SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM .01M 8C1F	PH CACL2 1:2 8C1F	PH H2O 1:1
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->							<- - - - -PCT - - - ->										
811508	1	28.7	0.4	--	0.0	29.7	1.6		31.3	27.7			95	100	TR				7.1	7.4
811509	2	30.1	0.3	0.1	0.3	30.8	3.7		34.5	27.2			89	100	TR				7.3	7.7
811510	3	32.9	0.1	0.2	0.9	33.1	2.2		35.3	31.6			94	100	TR				7.4	7.8
811511	4	34.0	0.1	TR	0.4	34.5	2.6		37.1	30.4			93	100	TR				7.4	7.8

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL CLAY K2O 6G3A	TOT ANL CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
811508	1								
811509	2								
811510	3								
811511	4	MT 4	KK 3	QZ 2	MI 1	KK30		1.2	5.5

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 43 PCT .1-75MM 9

ESTIMATED BULK DENSITY FOR LAYER 1,

ANALYSES: S= ALL OR SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL KK KAOLINITE QZ QUARTZ MI MICA

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Catalpa.

Pedon Number: S81MS-081-3

Classification: Fine, montmorillonitic, thermic Fluvaquentic Hapludolls.

Location: Lee County, Mississippi: About 75 meters east and 20 meters north of the SW corner of the NE 1/4, Sec. 35, T.10S., R.5E. Treatment 14 - Rep. 1 of F. Whisler's 1980 Weed Control Study at the Verona Agric. Exp. Station.

Use and Vegetation: Cropland - presently in ryegrass - previously cropped to soybeans.

Parent Material: Clayey alluvium over marly clay of the Blackland Prairie.

Region: Alabama, Mississippi and Arkansas Blackland Prairie - MLRA 135.

Position: Low terrace.

Elevation: About 80 meters.

Drainage and Permeability: Moderately well-drained, very slowly permeable.

Water Table and Duration: None observed.

Slope: 1.5 percent - slightly convex foot slope between bottomland and upland.

Sampled and Described By: Larry F. Ratliff and F. Whisler Date: 2-25-81

Ap -- 0 to 13 cm.; very dark gray (10YR3/1) clay loam; weak fine platy parting to weak fine subangular blocky structure; very hard, friable; common fine roots; common pockets of partially decomposed organic residue; mildly alkaline; clear smooth boundary. (811508).

A12 -- 13 5o 25 cm.; very dark gray (10YR3/1) clay loam; massive, weakly expressed plow pan; very hard, firm; few fine roots; few fine and medium pores; mildly alkaline; clear smooth boundary. (811509).

B21 -- 25 to 51 cm.; very dark gray (10YR3/1) silty clay; few fine faint yellowish brown mottles; moderate fine and medium angular blocky structure; extremely hard, very firm; few fine roots and pores; many pressure faces on surfaces of peds; mildly alkaline; gradual wavy boundary. (811510).

B22 -- 51 to 107 cm.; dark gray (10YR4/1) silty clay; common fine faint yellowish brown and dark brown mottles; weak fine and medium angular blocky structure; extremely hard, very firm, many pressure faces on peds; few fine pitted concretions of CaCO3; mildly alkaline; gradual wavy boundary. (811511).

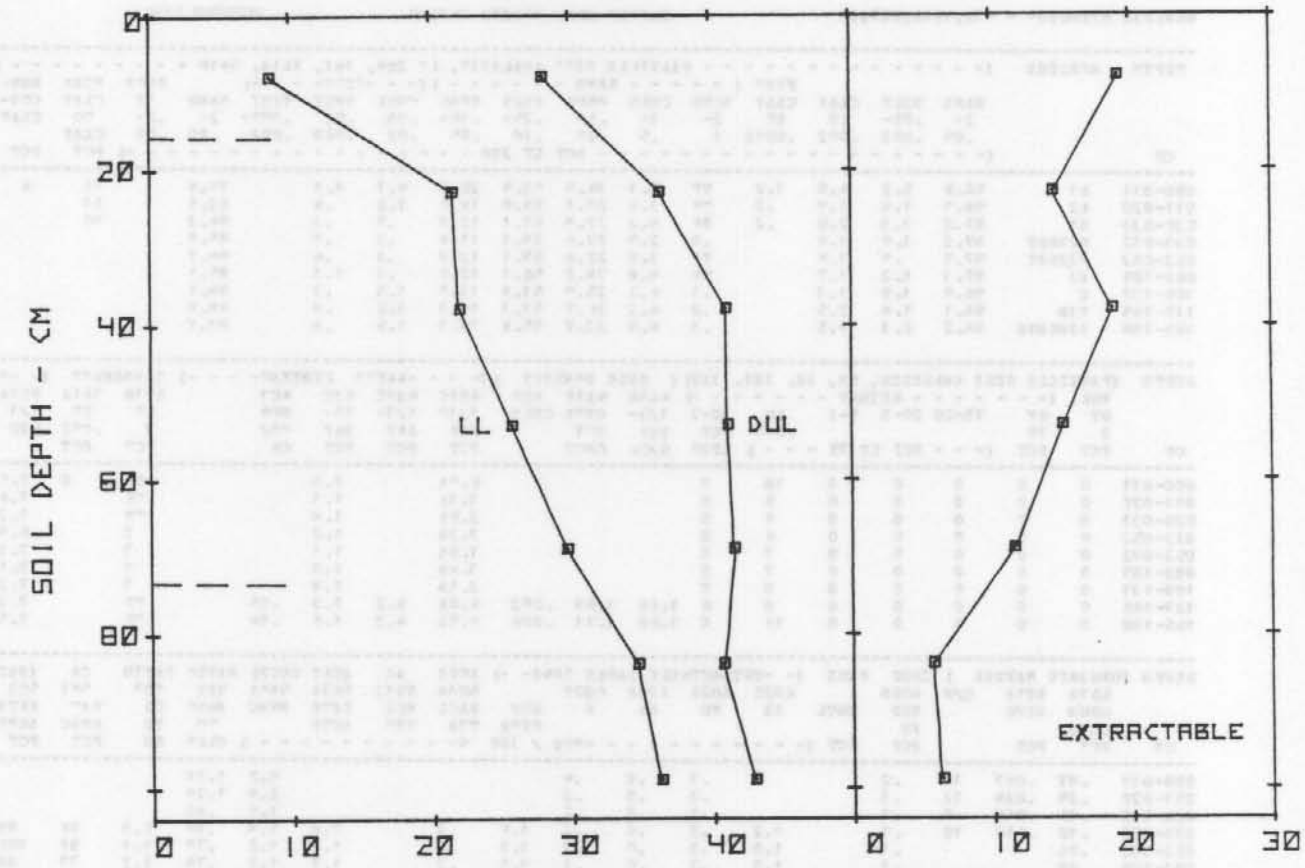
B23 -- 107 to 152 cm.; gray (10YR5/1) silty clay; common fine faint yellowish brown mottles; weak fine and medium angular blocky structure; extremely hard, very firm; many pressure faces on peds; common fine pitted concretions of CaCO3; moderately alkaline.

Remarks: Colors are for moist soil.

Field Measured Soil Water Data Contributed By: F. D. Whisler, Department of Agronomy and Soils, Mississippi State University.

Pedon Number: S81MS-081-3

FIELD MEASURED SOIL WATER LIMITS



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	8.9	28.4	19.5
23	21.9	36.7	14.8
38	22.4	41.4	19.0
53	26.1	41.5	15.4
69	30.0	41.9	11.9
84	35.0	41.1	6.1
99	36.6	43.3	6.7

TOTAL WATER EXTRACTED FROM PROFILE = 14.2 Cm.

SOIL CLASSIFICATION- MIXED, THERMIC ALFIC USTIPSAMMENT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, WFSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SERIES - - - - - - - CIRCLEBACK

SOIL NO - - - - - - S75TX-17-4 COUNTY - - - PARLEY

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760272-760280 DECEMBER 1978

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS SAND 2-1	COFS SAND 1-.5	MEDS SAND .5-.25	FNES SAND .25-.10	VFNS SAND .10-.05	COSI SILT .05-.02	FNSI SILT .02-.002	VFSI SILT .002-.005	SAND 2-.10	INTS SAND .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	8D1 1S-BAR TO CLAY
		(- - - - - - - - - - - - - - - - PCT LT 2MM - - - - - - - - - - - - - - - -)														PCT	PCT	CLAY
000-011	A1	90.8	5.2	4.0	1.2	TR	2.1	18.5	53.9	20.4	4.1	1.1		70.4		30	4	.83
011-020	A2	96.5	1.6	1.9	.2	TR	3.4	20.1	59.0	14.0	1.2	.4		82.5		11		.68
020-033	B1	97.0	1.0	2.0	.2	TR	4.2	22.9	57.1	12.8	.7	.3		88.2		10		.70
033-052	B21&BT	97.2	1.0	1.8		.0	2.9	23.6	59.3	11.4	.3	.7		86.8				.67
052-082	B22&BT	97.5	.9	1.6		TR	3.0	22.6	59.1	12.8	.3	.6		84.7				.69
082-109	B3	97.1	1.2	1.7		TR	4.8	24.2	56.1	12.0	.1	1.1		86.1				.59
109-137	C	96.9	1.8	1.3		.1	6.2	25.9	51.9	12.8	1.5	.3		84.1				1.08
137-165	B1B	96.1	1.4	2.5		.0	6.2	26.7	53.1	10.1	1.0	.4		86.0				.52
165-198	B2B&BTB	94.2	2.3	3.5		.1	4.9	23.7	55.8	11.1	1.9	.4		83.1				.96

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 PCT LT 75	20-2 LT20	(BULK DENSITY) 4A1D 1/3- BAR G/CC	4A1F OVEN DRY G/CC	4D1 COLE	(-WATER CONTENT- 4B1C 1/10 BAR PCT	4B1C 1/3- BAR PCT	4B2 15- BAR PCT	4C1 WRD CM/CM	CARBONATE 6F1B LT 2 PCT	3A1A LT .002 PCT	(-PH- 8C1A 1/1 H2O	8C1F 1/2 CACL
000-011	0	0	0	0	0	18	0				8.0A		3.3		TR	0	7.5	7.2
011-020	0	0	0	0	0	9	0				3.1A		1.3		TR		7.4	6.9
020-033	0	0	0	0	0	8	0				2.8A		1.4		TR		7.2	6.6
033-052	0	0	0	0	0	6	0				3.2A		1.2		0		6.9	6.3
052-082	0	0	0	0	0	7	0				1.9A		1.1		0		7.2	6.5
082-109	0	0	0	0	0	7	0				3.4A		1.0		0		7.1	6.4
109-137	0	0	0	0	0	8	0				2.5A		1.4		0		7.2	6.4
137-165	0	0	0	0	0	8	0	1.66	1.69	.002	4.0A	4.2	1.3	.05	TR		7.3	6.7
165-198	0	0	0	0	0	11	0	1.68	1.71	.006	4.5A	4.2	1.6	.04	TR		7.5	6.7

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(-EXTRACTABLE BASES 5B4A- 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TRA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTR ACTY	5A6A NH4AC	RATIO 9D1 NH4AC TO CLAY	RATIO 9D1 NH4AC CA TO MG	CA SAT NH4AC PCT	(BASE SAT) 5F1 5C3 EXTR ACTY PCT	5C1 NH4AC PCT
						(- - - - - - - - - - - - MEQ / 100 G- - - - - - - - - - - -)													
000-011	.97	.067	14	.2			.7	.0	.4						6.2	1.55			
011-020	.29	.024	12	.1			.3	.0	.2						2.4	1.25			
020-033	.15	.016	9	.1			.2	.0	.1						1.6	.40			
033-052	.10	.010	10	.1		1.2	.2	.0	.2	1.6	.2		1.8	1.8	.78	6.0	86	89	114
052-082	.06			.1		1.0	.3	.0	.2	1.5	.0		1.5	1.2	.75	3.3	93	100	125
082-109	.08			.1		1.0	.3	.0	.2	1.5	.2		1.7	1.3	.76	3.3	77	88	115
109-137	.08			.2		1.0	.4	TR	.2	1.6	.1		1.7	1.4	1.06	2.5	71	94	114
137-165	.07			.2		1.1	.5	.0	.2	1.8	.3		2.1	1.6	.64	2.2	69	86	113
165-198	.06			.2		1.5	.6	.0	.2	2.3	TR		2.3	2.2	.63	2.5	68	100	105

DEPTH CM	(SATURATED PASTE) 8F1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(- - - - - - - - - SATURATION EXTRACT 8A1- 8A1B EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT	4F2 PLST INDX
									(- - - - - - - - - - MEQ / LITER - - - - - - - - - -)									PCT	
000-011																			
011-020																			
020-033																			
033-052																			
052-082																			
082-109	27000	7.3	23.0					.13											
109-137																			
137-165																			
165-198																			

CLAY MINERALOGY (7A2C).
033-52 MI3 VM2 KK2.
165-198 MI3 VM2 KK2.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA.
SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
033-52 VFNS - RE85 QZ84 FE1 ZP FD14 GN1. FNFS - RE95 QZ80 CD7 PK5 (338 GRAINS).
165-198 VFNS - RE93 QZ90 FE1 ZF1 SP RU FD7 HN AU.
COMMENTS: WEIGHTED AVERAGE OF 94 PCT. RESISTANT MINERALS IN THE 8216BT.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS FD = FELDSPARS HN = HORNBLENDE QZ = QUARTZ ZP = ZIRCON
PK = POTASSIUM FELDSPAR CD = CHALCEDONY RU = RUTILE GN = GARNET SP = SPHENE AU = AUGITE.

(A) METHOD 4B1A

Series: Circleback[1/].

Pedon Number: S75TX-17-4

Classification: Mixed, thermic Alfic Ustipsamments. According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 1.2 miles north on Farm Road 1731 from its intersection with Farm Road 746. Site is about 15 meters west of road in native pasture. (Soil Moisture Site #4).

Use and Vegetation: Rangeland - shinnery oak, Giant dropseed, and soapweed.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1198 meters.

Drainage and Permeability: Excessively drained and rapidly permeable.

Water Table and Duration: None observed.

Slope: About 3 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff.

Sampled By: B. L. Allen, D. Blackstock and G. Threlkeld Date: 10-15-75

A1 - 0 to 11 cm.; dark grayish brown (10YR4.5/2 dry) or very dark brown (10YR2/2 moist) fine sand; massive; soft, very friable; fine roots range from few to common; with most being less than about 1 mm. diameter; noncalcareous; neutral; clear wavy boundary. (760272).

A2 - 11 to 20 cm.; yellowish brown (9YR5/4 dry) or dark brown (10YR4/3 moist) fine sand; massive; soft, very friable; roots common and many are large, ranging up to 6 cm. diameter; noncalcareous; neutral; clear wavy boundary. (760273).

B1 - 20 to 33 cm.; light brown (7.5YR6/4 dry) or dark brown (7.5YR4/4 moist) fine sand; massive; soft, very friable; roots are generally few but are common in places and range up to 6 cm. diameter; few volumes of 9YR7/3 dry, 5/3 moist, commonly range from approximately 2 to 10 cm. diameter, some are roughly circular in cross section and others are of irregular shape; noncalcareous; neutral; clear wavy boudnary. (760274).

B21 & Bt - 33 to 52 cm.; dominantly light brown (7.5YR6/4 dry) or dark brown (7.5YR4/4 moist) fine sand; massive; slightly hard, very friable; few roots, generally 1-2 mm. diameter, in places up to 5 mm. diameter; scattered volumes of irregular shape, colored 7.5YR7/4 dry, 7.5YR5/4 moist; a discontinuous band of clay accumulation, about 1 mm. thick and colored 5YR6/6 dry, 5/6 moist, extends for about 50 cm. in the center of the horizon, then disappears; noncalcareous; mildly alkaline; clear wavy boundary. (760275).

B22 & Bt - 52 to 82 cm.; light reddish brown (6YR6/4 dry) or reddish brown (76YR4.5/4 moist), fine sand; massive; slightly hard, very friable; few roots, generally 1-2 mm. in diameter, a few about 1 cm. diameter and one 6 cm. diameter; two discontinuous, roughly horizontal bands of clay accumulation about 1 mm. thick occur in the center of the horizon and are 3-4 cm. apart; noncalcareous; mildly alkaline; clear wavy boundary. (760276).

B3 - 82 to 109 cm.; light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/4 moist) fine sand; massive; slightly hard, very friable; few roots; slightly acid; clear wavy boundary. (760277).

C - 109 to 137 cm.; light reddish brown (6YR6/4 dry) reddish brown (6YR4.5/4 moist) fine sand; massive; mostly soft, few parts slightly hard; very friable; few roots; slightly acid; clear wavy boundary. (760278).

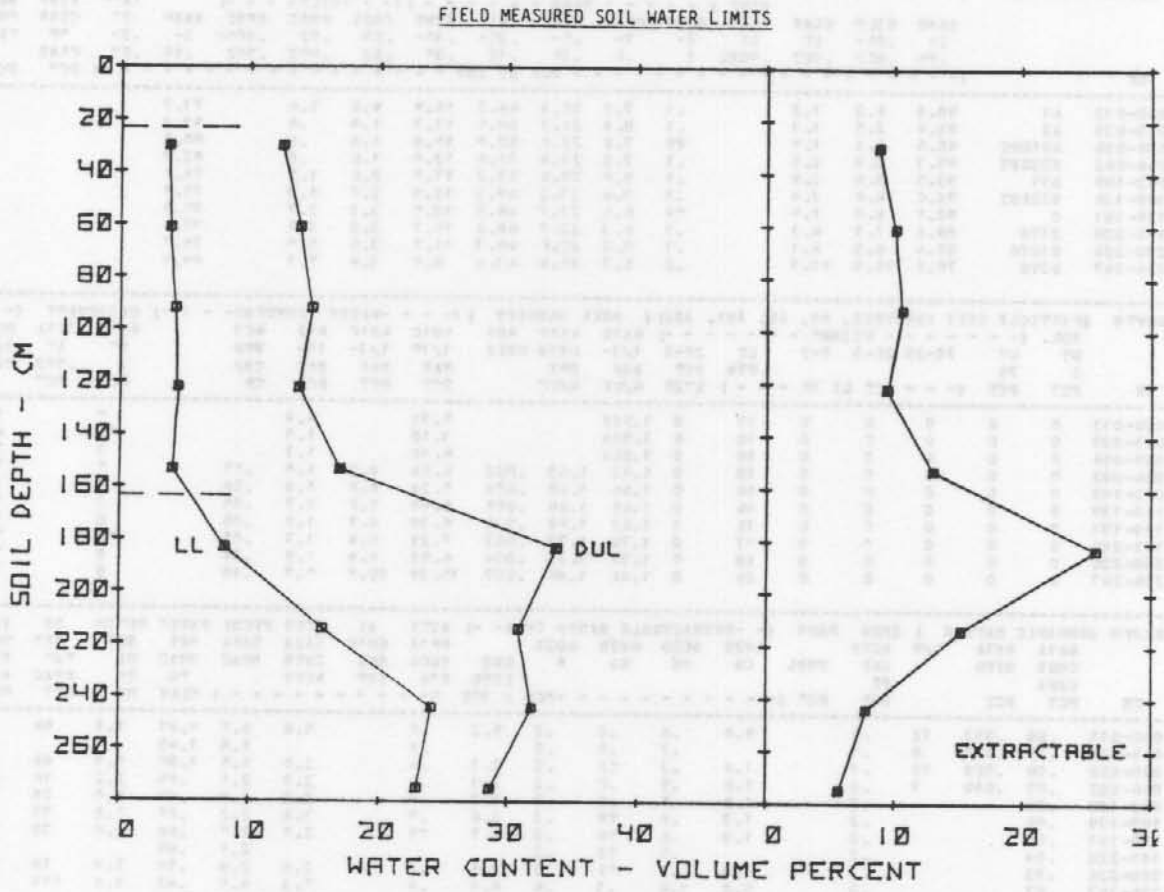
B1b - 137 to 165 cm.; light reddish brown (5YR6/4 dry) or reddish brown (5YR4.5/4 moist) fine sand; massive; slightly hard, very friable; very few roots, slightly acid; clear wavy boundary. (760279).

B2b & Btb - 165 to 198 cm.; dominantly light reddish brown (5YR6/4 dry) or reddish brown (5YR4.5/4 moist) fine sand; massive; slightly hard, very friable; very few roots; horizon has six roughly horizontal bands of clay accumulation, colored 5YR5/6 dry, and from 2-8 cm. apart; they range from 1-3 mm. thick, being thickest in the upper part of the horizon; slightly acid. (760280).

Remarks: 1/ Circleback is a proposed series.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-4



SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
		Volume Percent Water	
30	3.7	12.5	8.8
61	3.8	13.9	10.1
92	4.2	14.8	10.6
122	4.4	13.8	9.4
153	4.0	17.0	13.0
183	8.1	33.8	25.7
214	15.7	30.9	15.2
244	24.1	31.9	7.8
275	23.0	28.7	5.7

TOTAL WATER EXTRACTED FROM PROFILE = 33.8 Cm.

SOIL CLASSIFICATION- MIXED, THERMIC ALFIC USTIPSAMMENT

SERIES - - - - - - - CIRCLEBACK

SOIL NO - - - - - - S75TX-17-5 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760281-760290

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DECEMBER 1978

DEPTH	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND: VCOS 2-1	COS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT: COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 3D1 15-BAR TO CLAY
CM		(- - - PCT LT 2MM - - -)														PCT	PCT	
000-013	A1	90.6	6.2	3.2		.1	7.1	20.3	46.2	16.9	4.6	1.6		73.7				1.38
013-039	A2	96.4	2.5	1.1		.1	8.4	24.1	50.5	13.3	1.9	.6		83.1				1.36
039-056	B21SBT	95.5	2.6	1.9		TR	7.0	22.6	50.9	15.0	1.8	.8		80.5				.68
056-082	B22SBT	95.1	2.4	2.5		.1	7.2	23.4	51.6	12.8	1.6	.8		82.3				.60
082-109	B31	93.5	3.6	2.9		.1	5.8	20.4	50.2	17.0	2.6	1.0		76.5				.48
109-139	B32SBT	92.0	4.6	3.4		.1	7.6	23.2	48.2	12.9	2.7	1.9		79.1				.50
139-181	C	90.1	6.0	3.9		TR	6.5	21.7	48.9	13.0	3.3	2.7		77.1				.39
181-208	B1TB	88.6	7.1	4.3		.1	6.3	22.7	48.8	10.7	3.2	3.9		77.9				.40
208-226	B12TB	87.4	6.5	4.1		.1	5.3	22.0	49.3	10.7	3.0	5.5		76.7				.46
226-247	B2TB	78.8	10.5	10.7		.2	5.7	20.4	43.6	9.9	3.4	7.1		69.9				.47

DEPTH	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2	WEIGHT: GT 75	75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR	4A1H OVEN DRY	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR	4B1C 1/3-BAR	4B2 15-BAR	4C1 WRD	CARBONATE 6E1B LT 2	3A1A LT .002	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
CM	PCT	PCT	(- - - PCT LT 75 - - -)					G/CC	G/CC		PCT	PCT	PCT	CM/CM	PCT	PCT		
000-013	0	0	0	0	0	17	0	1.50A			9.38		4.4		0		7.0	6.5
013-039	0	0	0	0	0	10	0	1.50A			3.1B		1.5		TR		6.9	6.3
039-056	0	0	0	0	0	10	0	1.60A			4.1B		1.3		0		7.3	6.6
056-082	0	0	0	0	0	10	0	1.62	1.63	.002	4.7B	4.5	1.5	.05	0		7.8	6.9
082-109	0	0	0	0	0	14	0	1.66	1.68	.004	5.28	4.8	1.4	.06	0		7.8	7.0
109-139	0	0	0	0	0	14	0	1.65	1.68	.006	5.49	5.0	1.7	.05	0		7.8	7.0
139-181	0	0	0	0	0	16	0	1.67	1.69	.004	6.3B	4.7	1.9	.05	0		7.2	6.4
181-208	0	0	0	0	0	17	0	1.70	1.71	.002	7.28	4.4	1.7	.05	TR		7.3	6.5
208-226	0	0	0	0	0	18	0	1.70	1.73	.006	8.9B	6.4	1.9	.09	0		7.0	6.4
226-247	0	0	0	0	0	26	0	1.80	1.84	.007	15.3B	10.5	5.0	.10	0		7.2	6.7

DEPTH	ORGANIC MATTER 6A1A ORGN CARB	6B1A NITG	C/N	IRON 6C2B EXT FE	PHOS TOTL	EXTRACTABLE BASES 5B4A: 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC	(BASE SAT) 5C3 EXTB ACTY	5C1 NHAC
CM	PCT	PCT		PCT	PCT	(- - - MEQ / 100 G - - -)											PCT	PCT	PCT
000-013	.66	.053	12	.2		4.4	.6	.0	.2	5.2	.6		5.8	4.7	1.47	7.3	94	90	111
013-039	.13	.016	8	.1			.2	.0	.2		.4			1.6	1.05				
039-056	.08	.008	10	.1		1.6	.3	TR	.2	2.1	.4		2.5	1.9	1.00	5.3	84	84	111
056-082	.07	.010	7	.2		1.6	.5	.0	.2	2.3	.0		2.3	2.1	.84	3.2	76	100	110
082-109	.09			.2		1.5	.5	.0	.2	2.2	.0		2.2	2.0	.69	3.0	75	100	110
109-139	.06			.2		1.7	.6	TR	.3	2.6	.0		2.6	2.2	.65	2.8	77	100	118
139-181	.06			.2		1.8	.6	TR	.3	2.7	TR		2.7	2.5	.64	3.0	72	100	108
181-208	.04			.2			.5	TR	.2					2.1	.49				
208-226	.03			.2		1.9	.5	TR	.2	2.6	.0		2.6	2.4	.59	3.8	79	100	108
226-247	.07			.4		5.0	1.4	.1	.4	6.9	.4		7.3	4.5	.42	3.6	111	95	153

DEPTH	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O	NA 5D2 ESP	NA 5E SAR	SALT 6D5 TOTL SOLU	GYP 6F1A	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT	4F2 PLST INDX
CM	CM		PCT	PCT		PPM	PCT		(- - - MEQ / LITER - - -)									PCT	
000-013																			
013-039																			
039-056																			
056-082																			
082-109	19000	8.1	21.2					.23											
109-139																			
139-181																			
181-208																			
208-226																			
226-247																			

CLAY MINERALOGY (7A2C).
226-247 MM3 MI3 KK2 MC1.
COMMENTS: MM IS POORLY ORDERED, MOSTLY LOW CHARGE MONTMORILLONITE.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA MC = MONTMORILLONITE-CHLORITE.

SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
056-82 VFNS - RE87 QZ85 FE1 ZR1 TM SP FD13 KY GN. FNES - RE96 QZ96 FK4 (320 GRAINS).
226-247 VFNS - RE89 QZ87 ZR1 FE TM SP FD10 GS AU GN CL.
COMMENTS: WEIGHTED AVERAGE OF 95 PCT. RESISTANT MINERALS IN THE B22SBT.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS CL = CHLORITE FD = FELDSPARS GS = GLASS QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON FK = POTASSIUM FELDSPAR SP = SPHENE KY = KYANITE GN = GARNET AU = AUGITE.

(A) ESTIMATE
(B)) BY METHOD 4B1A

Series: Circleback[1/].

Pedon Number: S75TX-17-5

Classification: Mixed, thermic Alfic Ustipsamments. According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 1.3 miles north on Farm Road 1731 from its intersection with Farm Road 746. Site is 40 meters west of road in native pasture. (Soil Moisture Site #5).

Use and Vegetation: Rangeland - an oak community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1196 meters.

Drainage and Permeability: Excessively drained and rapidly permeable.

Water Table and Duration: None observed.

Slope: About 1 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff.

Sampled By: B. L. Allen, D. Blackstock and G. Threlkeld Date: 10-15-75

A1 - 0 to 13 cm.; brown (10YR5/3 dry) or very dark grayish brown (10YR3/2 moist) fine sand; massive; soft, very friable; common fine roots; slightly acid; abrupt wavy boundary. (760281).

A2 - 13 to 39 cm.; pale brown (9YR6.5/3 dry) or brown (10YR4.5/3 moist) fine sand; massive; slightly hard and soft, very friable; roots common, most ranging from 1 mm. to 3 cm. diameter; noncalcareous; mildly alkaline; clear wavy boundary. (760282).

B21 & Bt - 39 to 56 cm.; dominantly light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/6 moist) fine sand, massive; slightly hard, very friable; few roots, ranging from 1 mm. to 1 cm. diameter; horizon has two discontinuous bands of clay accumulation and two continuous bands, 5YR5/6 dry, 5YR3.5/6 moist, 1 to 2 mm. thick, with texture of loamy fine sand; bands range from 2 to 6 cm. apart; very few circular volumes, 2 to 3 cm. diameter, 7.5YR7.5/4 dry; noncalcareous; mildly alkaline; clear wavy boundary. (760283).

B22 & Bt - 56 to 82 cm.; dominantly light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/4 moist) fine sand; massive; slightly hard, very friable; few roots, ranging from 1 to 5 mm. diameter; several roughly circular, light colored volumes, 2 to 3 cm. diameter, that may be root channel fillings; horizon has four to six bands of clay accumulation, ranging from 1 to 3 cm. thick and 2 to 4 cm. apart, 5YR5/6 dry, 5YR3.5/6 moist, with texture of loamy fine sand; in places the bands disappear laterally but on this end of trench usually appear again where wall of trench is scraped back; bands generally sparse or absent in west end of trench; undulations in bands are common, ranging up to about 6 cm.; noncalcareous; mildly alkaline; clear wavy boundary. (760284).

B31 - 82 to 109 cm.; light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/6 moist) sand; massive; slightly hard, very friable; very few roots; noncalcareous; moderately alkaline; clear wavy boundary. (760285).

B32 & Bt - 109 to 139 cm.; light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/4 moist) sand; massive; slightly hard, friable; very few roots; one clay-enriched band, about 1 mm. thick, 5YR3.5/6 moist, occurs discontinuously in center of horizon; noncalcareous; moderately alkaline; clear wavy boundary. (760286).

C - 139 to 181 cm.; light brown (7.5YR6/4 dry) or brown (7.5YR4.5/4 moist) with few parts slightly lighter in color; loamy sand; massive; slightly hard and hard, very friable; very few roots; few very fine tubular pores; noncalcareous; neutral; clear wavy boundary. (760287).

B11tb - 181 to 208 cm.; dominantly pale brown (10YR6.5/3 dry) or brown (10YR4.5/3 moist) with few parts slightly lighter in color; loamy sand; massive; slightly hard and hard, very friable; very few roots; few very fine tubular pores; noncalcareous; neutral; clear wavy boundary. (760288).

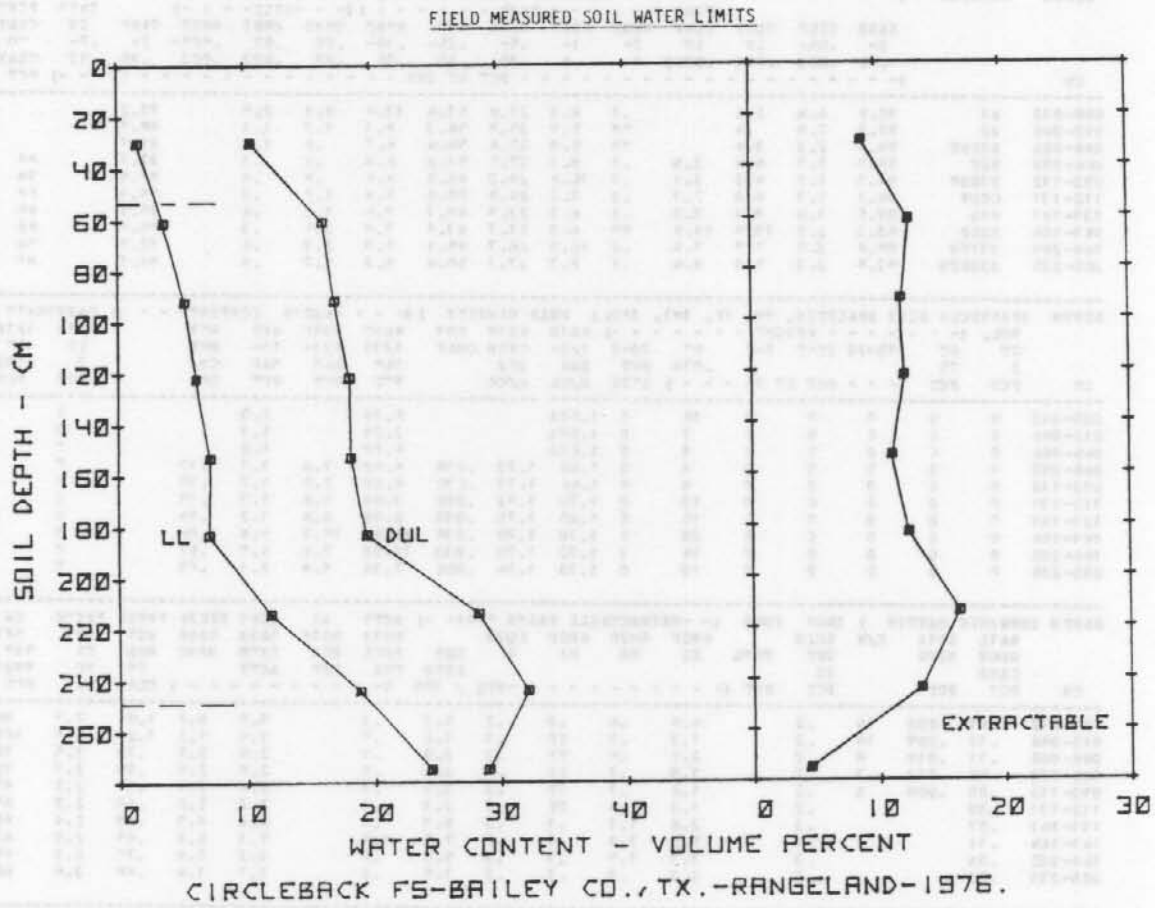
B12tb - 208 to 226 cm.; pale brown (10YR 6.5/3 dry) or yellowish brown (10YR5/4 moist) sand; very weak medium subangular blocky structure; slightly hard, very friable; few very fine tubular pores; noncalcareous; neutral; clear wavy boundary. (760289).

B2tb - 226 to 247 cm.; dominantly gray (5Y6/1 dry, 5Y5/1 moist) with some 5Y7/1 dry; few mottles of 10YR4/3 dry and 7.5YR5/4 dry; sandy loam; weak coarse subangular blocky structure; very hard, very firm; very hard in place and difficult to remove; very few roots; common very fine and fine tubular pores; slightly acid. (760290).

Remarks: 1/ Circleback is a proposed series.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-5



SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	1.6	10.5	8.9
61	3.6	16.2	12.6
92	5.2	17.1	11.9
122	6.1	18.2	12.1
153	7.2	18.3	11.1
183	7.1	19.5	12.4
214	11.9	28.3	16.4
244	18.9	32.2	13.3
275	24.5	29.0	4.5

TOTAL WATER EXTRACTED FROM PROFILE = 32.9 Cm.

SOIL CLASSIFICATION- MIXED, THERMIC PSAMMENTIC PALEUSTALF

SERIES - - - - - - - CIRCLEBACK PHASE

SOIL NO - - - - - - S75TX-17-6 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 76029 1-76030 0 DECEMBER 1978

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	COSE 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTS II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -) PCT LT 2MM																
000-012	A1	90.8	6.6	2.6		.1	4.3	21.4	51.4	11.6	4.1	2.5		77.2				1.12
012-046	A2	97.2	2.4	.4		TR	5.9	25.9	56.3	9.1	1.3	1.1		88.1				2.75
046-066	A2&BT	94.4	2.2	3.4		TR	5.9	27.4	54.4	6.7	.9	1.3		87.7				.53
066-092	B2T	94.5	1.1	4.4	2.9	.1	8.3	27.5	51.8	6.9	.8	.3		87.7		66		.39
092-112	B3&BT	94.5	1.3	4.2	3.1	.1	10.6	29.2	48.0	6.6	.9	.4		87.9		74		.40
112-131	C&BT	94.3	1.7	4.0	2.7	.2	7.2	26.9	50.6	9.4	1.5	.2		84.9		68		.43
131-141	B1B	89.5	1.4	9.1	5.5	.1	6.3	23.9	49.7	9.6	1.0	.4		79.9		60		.35
141-164	B2TB	83.3	2.8	13.9	11.9	TR	6.3	21.7	47.5	7.8	2.5	.3		75.5		86		.46
164-205	B31TB	88.8	3.5	7.7	7.4	.2	10.9	26.7	45.1	5.9	2.9	.6		82.9		96		.52
205-235	B32&TB	92.7	2.3	5.0	4.4	.1	8.7	27.3	50.4	6.2	1.7	.6		86.5		88		.46

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)		(- - - PCT LT 75 - - -)															
000-012	0	0	0	0	0	16	0	1.50A			5.3B		2.9		0		7.0	6.5
012-046	0	0	0	0	0	7	0	1.50A			2.2B		1.1		0		6.8	6.1
046-066	0	0	0	0	0	8	0	1.60A			4.7B		1.8		0		6.7	6.1
066-092	0	0	0	0	0	8	0	1.65	1.72	.014	4.4B	7.6	1.7	.10	0		7.0	6.4
092-112	0	0	0	0	0	8	0	1.66	1.71	.010	4.8B	7.9	1.7	.10	0		7.0	6.3
112-131	0	0	0	0	0	10	0	1.72	1.72	.000	3.8B	6.8	1.7	.09	0		6.5	5.7
131-141	0	0	0	0	0	15	0	1.65	1.70	.010	8.9B	6.8	3.2	.06	0		6.4	5.9
141-164	0	0	0	0	0	20	0	1.70	1.78	.015	10.9B	10.9	5.4	.04	0		6.1	5.8
164-205	0	0	0	0	0	14	0	1.72	1.78	.012	11.5B	7.8	4.0	.07	0		6.4	5.9
205-235	0	0	0	0	0	10	0	1.73	1.76	.006	7.3B	5.4	2.3	.05	0		6.8	5.2

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA	6O2D MG	6P2F NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - - MEQ / 100 G - - -)													
000-012	.81	.058	14	.2		4.4	.6	.0	.2	5.2	.3		5.5	4.7	1.81	7.3	94	95	111
012-046	.13	.009	14	.2		1.3	.2	TR	.1	1.6	.0		1.6	1.3	3.25	6.5	100	100	123
046-066	.11	.014	8	.2		2.1	.6	TR	.2	2.9	.0		2.9	2.7	.79	3.5	78	100	107
066-092	.08	.012	7	.2		1.9	.7	TR	.2	2.8	.0		2.8	2.6	.59	2.7	73	100	108
092-112	.05	.008	6	.2		1.6	.7	TR	.2	2.5	.1		2.6	2.4	.57	2.3	67	96	104
112-131	.09			.2		1.3	.6	TR	.2	2.1	.1		2.2	2.0	.50	2.2	65	95	105
131-141	.07			.3		2.6	1.1	.1	.3	4.1	.5		4.6	4.0	.29	2.4	65	89	103
141-164	.11			.4		5.2	2.1	.1	.5	7.9	1.4		9.3	8.2	.59	2.5	63	85	96
164-205	.04			.3		3.7	1.5	.1	.3	5.6	.6		6.2	5.4	.70	2.5	69	90	104
205-235	.02			.2		2.3	.9	.1	.2	3.5	.2		3.7	3.4	.68	2.6	68	95	103

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - - MEQ / LITER - - -)										
000-012																			
012-046																			
046-066																			
066-092																			
092-112	19000	7.1	19.7					.16											
112-131																			
131-141																			
141-164																			
164-205																			
205-235																			

CLAY MINERALOGY (7A2C).
066-92 MI3 MM2 KK2 MC1.
205-235 MI3 MM3 KK2.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA MC = MONTMORILLONITE-CHLORITE.

SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
066-92 VFNS - RE89 QZ87 FE1 TM1 ZR SP FD11 GN HN. FNES - RE94 QZ94 FK6 (332 GRAINS).
205-235 VFNS - RE91 QZ88 FE2 TM1 ZR FD8 CL1.
COMMENTS: WEIGHTED AVERAGE OF 95 PCT. RESISTANT MINERALS IN THE B2T.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS CL = CHLORITE FD = FELDSPARS HN = HORNBLENDE QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON FK = POTASSIUM FELDSPAR SP = SPHENE GN = GARNET.

(A) ESTIMATED
(B) METHOD 4B1A

Series: Circleback[1/].

Pedon Number: S75TX-17-6

Classification: Mixed, thermic Psammentic Paleustalf[1/] According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 1.4 miles north on Farm Road 1731 from its intersection and Farm Road 746. Site is 46 meters west of road in native pasture. (Soil Moisture Site #6).

Use and Vegetation: Rangeland - an oak community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1195 meters.

Drainage and Permeability: Excessively drained and rapidly permeable.

Water Table and Duration: None observed.

Slope: About 2 percent.

Described By: L. H. Gile, Revised by the Texas Soil Survey Staff.

Sampled By: D. Blackstock and G. Threlkeld Date: 10-16-75

A1 - 0 to 12 cm.; brown (10YR5.5/3 dry) or very dark brown (10YR2/2 moist) fine sand; massive; soft, very friable and loose; fine roots common; noncalcareous; neutral; abrupt wavy boundary. (760291).

A2 - 12 to 46 cm.; very pale brown (10YR7/3 dry) or brown (10YR5/3 moist) fine sand; massive; soft and slightly hard, very friable; roots common and range from 1 mm. to 3 cm. diameter; slightly acid; abrupt wavy and irregular boundary. (760292).

A2 & Bt - 46 to 66 cm.; dominantly very pale brown (10YR7/3 dry) or brown (10YR5/3 moist); with lesser amounts reddish brown (5YR5/4 moist, 4/4 dry); the brown A2 material is fine sand, the reddish brown Bt material is loamy fine sand; weak medium subangular blocky structure; mostly hard, with a few parts slightly hard, friable; few roots, ranging from 1 to 5 mm. thick; the Bt part occurs as bands of clay accumulation ranging from 2 to 10 mm. thick, and as mottles and masses of irregular shape; bands are essentially horizontal with only slight undulations, 1 to 2 cm. magnitude; noncalcareous; neutral; abrupt smooth boundary (bottom of clay band). (760293).

B2t - 66 to 92 cm.; dominantly light reddish brown (5YR6/4 dry) or reddish brown (5YR5/4 moist) fine sand; massive; slightly hard, very friable; few roots, ranging from 1 to 5 mm. diameter; horizon has four essentially horizontal bands of clay accumulation, with the uppermost being about 1 cm. thick, the second usually being about 1 cm. thick but in places only 1/2 cm. thick, and the third and fourth ranging from 1 to 4 mm. thick; distance between the bands ranges from 6 to 10 cm.; the bands are light fine sandy loam, have color of 5YR4.5/6 dry, 5YR3.5/6 moist and are hard and firm; noncalcareous; mildly alkaline; abrupt smooth boundary. (760294).

B3 & Bt - 92 to 112 cm.; dominantly light reddish brown (6YR6/4 dry) or reddish brown (6YR4.5/5 moist) sand; massive; slightly hard, very friable; few roots; horizon has four to six bands of clay accumulation ranging from 1 to 3 mm. in thickness, and from 1 to 3 cm. apart; noncalcareous; mildly alkaline; clear wavy boundary. (760295).

C & Bt - 112 to 131 cm.; reddish yellow (6YR6/5 dry) or yellowish red (6YR4.5/5 moist) fine sand; massive; slightly hard, very friable; few roots; one discontinuous clay band, about 1 mm. thick; noncalcareous; neutral; clear wavy boundary. (760296).

B1b - 131 to 141 cm.; about equal parts of light reddish brown (5YR6/4 dry) or reddish brown (6YR4.5/4 moist) and yellowish red (5YR5/6 dry, 3.5/6 moist) loamy sand; massive; slightly hard, very friable; few roots; noncalcareous; neutral; clear smooth boundary. (760297).

B2tb - 141 to 164 cm.; red (2.5YR5/6 dry, 2.5YR4/6 moist) fine sandy loam; very hard, friable; compound weak coarse prismatic and very weak subangular blocky structure; generally few roots except for faces of prisms, where fine roots are common; noncalcareous; neutral; clear wavy boundary. (760298).

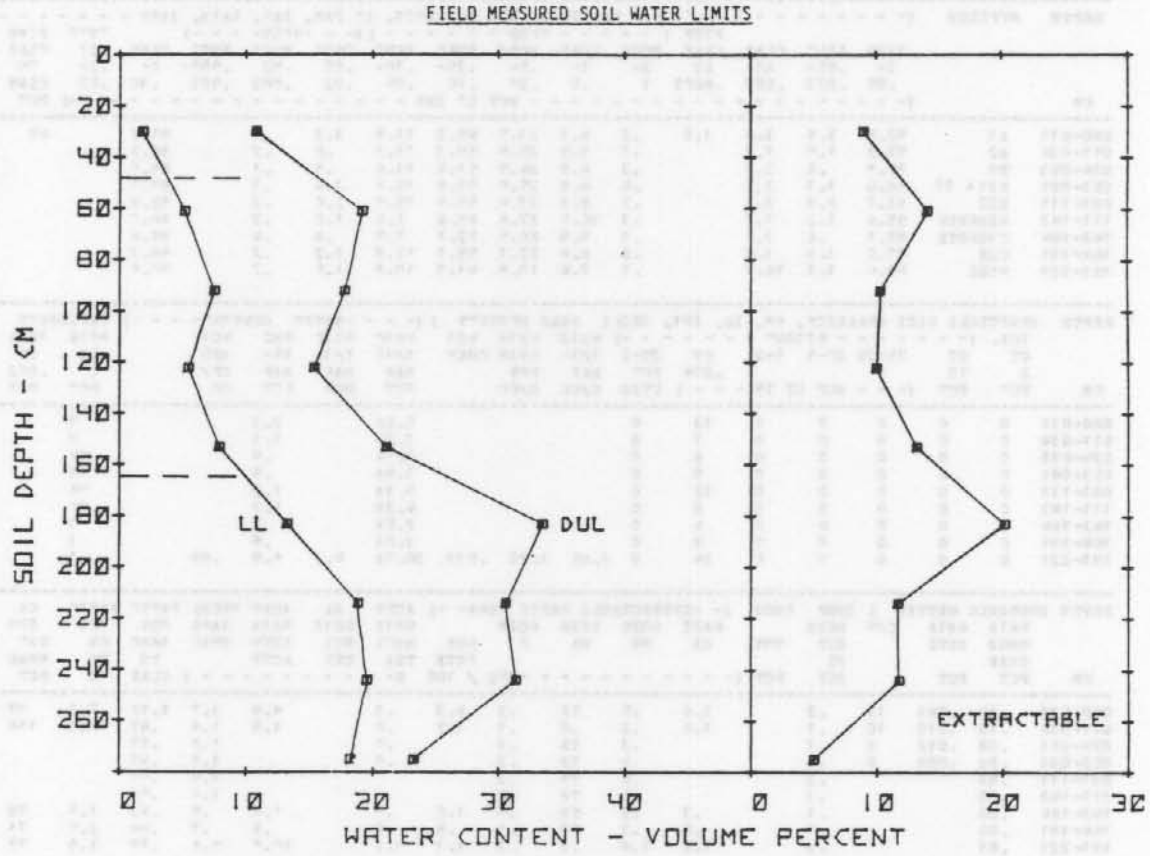
B31tb - 164 to 205 cm.; reddish yellow (5YR6/6 dry) or yellowish red (5YR4.5/6 moist) loamy sand; compound weak coarse prismatic and weak coarse subangular blocky structure; very hard, friable; very few roots except for faces of prisms, where fine roots are common; noncalcareous; neutral; clear wavy boundary. (760299).

B32tb - 205 to 235 cm.; dominantly reddish yellow (5YR6/6 dry) or yellowish red (5YR4.5/6 moist) fine sand; massive; slightly hard, friable; very few roots; few parts of 5YR5/6 dry, 5YR3.5/6 moist, occur as clay bands; noncalcareous; neutral.

Remarks: 1/Circleback is a proposed series. This pedon is considered a deep over loamy substratum phase.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-6



CIRCLEBACK PHASE-BAILEY CO., TX.-RANGELAND-1976.

SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	1.8	10.8	9.0
61	5.1	19.2	14.1
92	7.5	17.8	10.3
122	5.4	15.4	10.0
153	7.9	21.1	13.2
183	13.3	33.5	20.2
214	18.9	30.6	11.7
244	19.6	31.4	11.8
275	18.3	23.3	5.0

TOTAL WATER EXTRACTED FROM PROFILE = 33.6 Cm.

SOIL CLASSIFICATION- LOAMY, MIXED, THERMIC ARENIC ARIDIC HAPLUSTALF

SERIES - - - - - - CIRCLEBACK PHASE

SOIL NO - - - - - - S75TX-17-7 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B

SAMPLE NOS. 760301-760309

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DECEMBER 1978

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	COSS 1-.5	MEDS .5-.25	FINES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTII .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - - PCT LT 2MM)																
000-011	A1	92.9	3.8	3.3	1.5	.2	8.1	23.5	49.2	11.9	3.3	.5		81.0		45		.70
011-034	A2	97.3	1.0	1.7		.1	9.9	25.9	50.1	11.1	.8	.2		96.2				.65
034-053	B1	97.1	.6	2.3		.3	8.9	24.9	51.4	11.6	.5	.1		85.5				.39
053-081	B21 & BT	96.0	1.7	2.3		.4	8.9	25.0	50.9	10.9	1.4	.3		85.1				.39
081-111	B22	93.7	2.8	3.5		.2	8.1	23.6	50.9	10.9	2.6	.2		92.8				.34
111-143	B23&BTB	95.6	1.2	3.2		.3	10.5	27.4	49.8	7.6	1.0	.2		88.0				.38
143-164	C1B&BTB	97.1	.6	2.1		.3	9.9	26.5	52.7	7.7	.4	.4		99.4				.33
164-191	C2B	97.0	1.4	1.6		.2	6.8	22.1	55.1	12.8	1.2	.2		94.7				.56
191-221	IIB2	81.6	1.7	16.7		.1	7.0	19.8	43.9	10.8	1.5	.2		70.8				.41

DEPTH CM	VCL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4D1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1F 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)	(- - WEIGHT - -	- PCT LT 75 - -)					(BULK DENSITY)			(- - WATER CONTENT - -)							
000-011	0	0	0	0	0	13	0				5.0A		2.3		0		7.0	6.4
011-034	0	0	0	0	0	7	0				3.2A		1.1		0		7.2	6.5
034-053	0	0	0	0	0	8	0				3.5A		.9		TR		7.4	6.7
053-081	0	0	0	0	0	9	0				3.9A		.9		TR		7.4	6.7
081-111	0	0	0	0	0	12	0				5.1A		1.2		TR		7.4	6.7
111-143	0	0	0	0	0	8	0				4.2A		1.2		TR		7.1	6.4
143-164	0	0	0	0	0	6	0				2.5A		.7		0		6.3	5.5
164-191	0	0	0	0	0	9	0				3.0A		.9		0		6.2	5.3
191-221	0	0	0	0	0	24	0	1.85	1.92	.013	20.5A	9.1	6.9	.04	1		6.4	5.8

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NH4AC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - EXTRACTABLE BASES 5B4A - -	- MEQ / 100 G - -						- -)						
000-011	.52	.041	13	.2		3.6	.5	TR	.2	4.3	.1		4.4	3.7	1.12	7.2	97	99	116
011-034	.15	.015	10	.1		1.6	.2	.0	.1	1.9	.0		1.9	1.6	.82	8.0	114	100	136
034-053	.08	.013	6	.1			.3	TR	.1		.0			1.3	.57				
053-081	.06	.008	8	.1			.4	TR	.2		.0			1.5	.65				
081-111	.06			.2			.6	TR	.2					1.9	.51				
111-143	.05			.1			.5	TR	.2					1.6	.50				
143-164	.00			.1		.7	.2	TR	.1	1.0	.0		1.0	.9	.43	1.5	78	100	111
164-191	.00			.1		.5	.2	TR	.1	.8	.0		.8	.7	.44	2.5	71	100	114
191-221	.01			.3		7.0	1.8	.2	.3	9.3	1.2		10.5	9.6	.57	3.9	73	89	97

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - SATURATION EXTRACT 8A1 - - MEQ / LITER - -)										
000-011																			
011-034																			
034-053																			
053-081																			
081-111	18000	7.7	20.4					.23											
111-143																			
143-164																			
164-191																			
191-221																			

CLAY MINERALOGY (7A2C).
081-111 MI3 MM2 KK2.
191-221 MI3 MM3 KK2 MC1.
COMMENTS: MM MOSTLY LOW CHARGE MONTMORILLONITE.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA MC = MONTMORILLONITE-CHLORITE.

SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
081-111 VFNS - RE88 QZ85 EP1 ZR2 TM SP RU FD12 HN. FNES - RE93 QZ93 FK7 (330 GRAINS).
111-143 VFNS - RE86 QZ84 EP1 TM1 ZR SP FD14 EP HN.
191-221 VFNS - RE90 QZ88 EP1 TM ZR SP FD GN.
COMMENTS: WEIGHTED AVERAGE OF 93 PCT. RESISTANT MINERALS IN THE B22.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS EP = EPIDOTE FD = FELDSPARS HN = HORNBLENDE QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON FK = POTASSIUM FELDSPAR SP = SPHENE RU = RUTILE.

(A) METHOD 4B1A

Series: Circleback[1/].

Pedon Number: S75TX-17-7

Classification: Loamy, mixed, thermic Arenic Aridic Haplustalfs[1/]. According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 1.5 miles north on Farm Road 1731 from its intersection with Farm Road 746. Site is 23 meters west of road in native pasture. (Soil Moisture Site #7).

Use and Vegetation: Rangeland - an oak community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1195 meters.

Drainage and Permeability: Excessively drained and rapidly permeable.

Water Table and Duration: None observed.

Slope: About 1 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff

Sampled By: D. Blackstock and G. Threlkeld Date: 10-16-75

A1 - 0 to 11 cm.; grayish brown (10YR5/2 dry) or very dark grayish brown (10YR3/2 moist) sand; massive; soft, very friable; fine roots common in some areas, only few in others; noncalcareous; mildly alkaline; clear wavy boundary. (760301).

A2 - 11 to 34 cm.; dominantly light brownish gray (10YR6.5/3 dry) or dark brown (10YR4/3 moist) with lesser amount 10YR7/3 dry, 10YR5/3 moist; fine sand; massive; soft, very friable; few roots in some parts, common in others, ranging from less than 1 mm. to 3 cm. in diameter; noncalcareous; neutral; clear wavy boundary. (760302).

B1 - 34 to 53 cm.; very pale brown (10YR7/4 dry) or yellowish brown (10YR5/4 moist) in fine pattern with 10YR6/4 dry, 10YR4/4 moist; fine sand; massive; slightly hard, very friable; few roots; noncalcareous; mildly alkaline; clear wavy boundary. (760303).

B21 & Bt - 53 to 81 cm.; pink (7.5YR7/4 dry) or brown (7.5YR5/4 moist) fine sand; massive; soft, very friable; few roots; one discontinuous band of clay accumulation, 5YR5/4 dry, 1/2 to 1 mm. thick, occurring as segments a few cm. in length, separated by much wider zones in which the band is absent; noncalcareous, mildly alkaline; clear wavy boundary. (760304).

B22 - 81 to 111 cm.; light brown (7.5YR6/4 dry) or dark brown (7.5YR4/4 moist) fine sand; massive; slightly hard, very friable; few roots; noncalcareous; mildly alkaline; clear wavy boundary. (760305).

B2b & Btb - 111 to 143 cm.; very pale brown (9YR7/4 dry) or yellowish brown (9YR5/4 moist) sand; massive; hard and slightly hard, very friable; very few roots, horizon usually has about four, mostly continuous, clay-enriched bands, colored 5YR5/6 dry, 5YR4.5/6 moist; most bands are from 2 to 3 mm. thick, with one being about 1/2 cm. thick; bands usually 5 to 6 cm. apart, varying from 4 to 12 cm. apart; slightly acid; clear wavy boundary. (760306).

C1b & Btb - 143 to 164 cm.; very pale brown (10YR7/3 dry) or yellowish brown (10YR5/4 moist) fine sand; massive, slightly hard, very friable; two clay-enriched bands, 5YR5/4 dry, are continuous, approximately 2 mm. thick, and range from 5 to 10 cm. apart; slightly acid; clear wavy boundary. (760307).

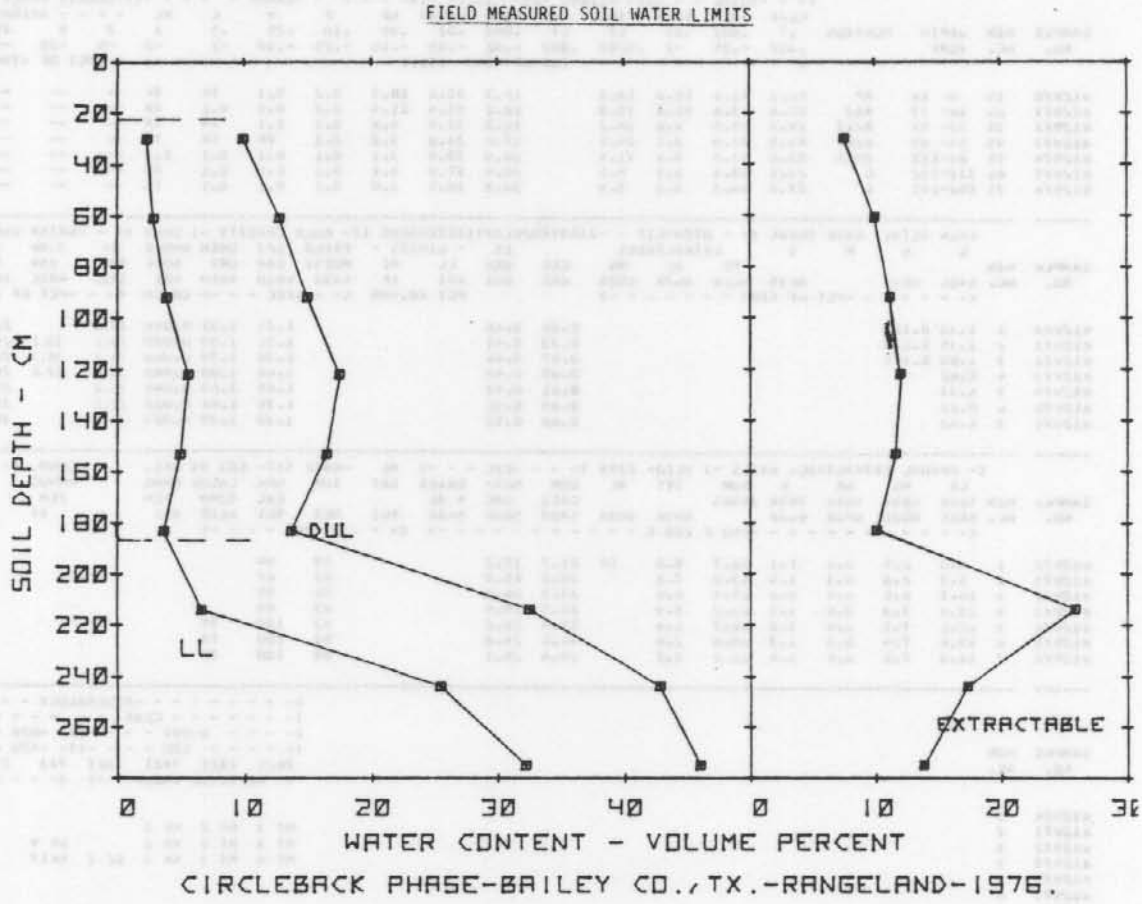
C2b - 164 to 191 cm.; very pale brown (10YR8/3 dry) or pale brown (10YR6/3 moist) fine sand; massive; soft, very friable; very few roots; slightly acid; abrupt wavy boundary. (760308).

Btb2 - 191 to 221 cm.; dominantly light brownish gray (2.5Y6/2 dry) or grayish brown (2.5Y5/2 moist) and 10YR7/4 dry, 10YR5/4 moist, and 10YR8/1 dry, 7/1 moist; fine sandy loam; weak coarse subangular blocky structure; very hard, very firm; very few roots except along some ped faces; clay skins, 10YR4/3 dry, on some ped faces along with a concentration of fine roots; slightly acid. (760309).

Remarks: 1/ Circleback is a proposed series. This pedon is considered a deep over loamy substratum phase.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-7



SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	2.3	9.9	7.6
61	2.8	12.8	10.0
92	3.8	15.0	11.2
122	5.5	17.5	12.0
153	4.9	16.5	11.6
183	3.6	13.7	10.1
214	6.6	32.5	25.9
244	25.5	42.8	17.3
275	32.2	46.0	13.8

TOTAL WATER EXTRACTED FROM PROFILE = 37.7 Cm.

CRETE I

CLASSIFICATION: FINE, MONTMORILLONITIC, MESIC PACHIC ARGIUSTOLL

S 81KS-077 -001 SAMPLE NOS. 81P2970 - 2976 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC -2	COARSE FRACTIONS(MM)-WEIGHT -5	-20	-75	75	>2MM WT WHOLE SOIL
				<- - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
812970	1S	0- 18	AP	18.1	71.1	10.8	13.0		15.5	55.6	10.5	0.2	0.1	TR	TR	--	--	--	TR	--
812971	2S	18- 33	A12	20.6	67.6	11.8	10.5		12.2	55.4	11.4	0.2	0.1	0.1	TR	--	--	--	TR	--
812972	3S	33- 53	B21T	31.4	55.5	4.6	26.2		18.0	37.5	4.4	0.1	0.1	TR	TR	--	--	--	TR	--
812973	4S	53- 89	B22T	45.5	51.4	3.1	24.5		17.6	33.8	3.0	0.1	TR	TR	TR	--	--	--	TR	--
812974	5S	89-112	B3CA	33.0	63.5	3.5	11.4		28.0	35.5	3.1	0.1	0.1	0.1	0.1	--	--	--	TR	--
812975	6S	112-152	C	29.1	67.4	3.5	5.9		30.4	37.0	3.1	0.2	0.1	0.1	TR	--	--	--	TR	--
812976	7S	152-191	C	27.4	69.3	3.3	5.9		30.8	38.5	3.0	0.1	0.1	0.1	TR	--	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6K3A	DITH-CIT EXTRACTABLE FE 6G2A	AL 6G7A	MN 6G2A	RATIO/CLAY CEC 8D1	LS 8D1	ATTERBERG - LIMITS - LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE WHOLE 2- 0.06 BAR 4B1A	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->			CM/CM
812970	1	1.38	0.122						0.84	0.46				1.29	1.31	0.016	12.8		22.7	8.4	0.18
812971	2	1.35	0.120						0.73	0.41				1.31	1.39	0.020	13.1	33.1	24.5	8.4	0.21
812972	3	1.00	0.101						0.67	0.46				1.38	1.59	0.048	26.7	28.7	26.2	16.4	0.11
812973	4	0.62							0.65	0.48				1.48	1.88	0.083	28.8	27.6	26.0	21.7	0.06
812974	5	0.33							0.81	0.58				1.45	1.63	0.040	25.8		25.0	19.0	0.09
812975	6	0.23							0.85	0.51				1.35	1.44	0.022	22.2		26.6	14.8	0.16
812976	7	0.22							0.88	0.52				1.30	1.39	0.023	22.1		30.4	14.2	0.21

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B3A 6N2E	MG 5B5A 6Q2G	NA 5B3A 6P2E	K 5B5A 6Q2G	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM .01M 8A1	PH CACL2 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->												<- - - -PCT - - - ->						
812970	1	5.0	2.5	0.1	1.1	12.7	9.0	TR	21.7	15.2			59	84					5.2	5.5
812971	2	5.3	2.6	0.1	1.0	13.0	7.8		20.8	15.0			63	87					5.3	5.6
812972	3	18.3	6.6	0.4	0.8	25.5	8.0		33.5	26.8			76	95					6.6	6.9
812973	4	20.4	7.3	0.4	1.1	29.2	5.9		35.1	29.4			83	99					6.8	7.1
812974	5	22.1	7.0	0.4	1.2	30.7	4.0		33.3	26.8			92	100	TR				7.5	7.8
812975	6	19.6	7.4	0.3	1.3	28.6	2.4		31.0	24.8			92	100	TR				7.6	7.8
812976	7	16.9	7.5	0.4	1.4	26.2	3.2		29.4	24.1			89	100	TR				7.6	7.9

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
812970	1								
812971	2	MT 3	MI 2	KK 2				2.3	4.3
812972	3	MT 3	MI 3	KK 2		KK 9		2.1	5.3
812973	4	MT 4	MI 3	KK 2	QZ 1	KK17		2.1	5.6
812974	5								
812975	6								
812976	7								

FAMILY CONTROL SECTION: DEPTH 33- 89 PCT CLAY 44 PCT .1-75MM 0

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Crete taxadjunct[1/].

Pedon Number: S81KS-077-1

Classification: Fine, montmorillonitic, mesic Pachic Argiustolls.

Location: Republic County, Kansas: 15 meters south and 15 meters west of the NE corner of the SE 1/4, Sec. 35, T.2S., R.5W., North Central Kansas Irrigation Experiment Farm.

Use and Vegetation: Cropland - presently in soybeans.

Parent Material: Loess.

Region: Central Loess Plains - MLRA 75.

Position: Upland.

Elevation: About 450 meters.

Drainage and Permeability: Well drained and slowly permeable.

Water Table and Duration: None observed.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-9-81

Ap - 0 to 18 cm.; very dark gray (10YR3/1) silt loam; weak fine granular structure; slightly hard, very friable; common fine and medium roots; few pockets of partially decomposed organic residue; strongly acid; clear smooth boundary. (812970).

A12 - 18 to 33 cm.; very dark gray (10YR3/1) silt loam; weak fine and medium subangular blocky structure; slightly hard, friable; many fine and medium roots; few fine, medium and coarse pores; few wormcasts and small pockets of partially decomposed organic residue; medium acid; abrupt smooth boundary. (812971).

B21t - 33 to 53 cm.; dark grayish brown (10YR3.5/2) light silty clay; weak medium subangular blocky parting to strong fine angular blocky structure; very hard, very firm; common fine and very fine roots between peds; few fine pores; thin continuous clay films on faces of peds; many pressure faces; neutral; gradual wavy boundary. (812972).

B22t - 53 to 89 cm.; dark grayish brown (10YR4/2) silty clay; moderate medium subangular blocky parting to moderate fine angular blocky structure; extremely hard, very firm; common very fine roots between peds; few fine pores; many pressure faces; common slickensides; few streaks of (10YR3/1) silt loam in old cracks; thick continuous clay films on faces of peds; neutral; gradual wavy boundary. (812973).

B3ca - 89 to 112 cm.; brown (10YR5/3) silty clay loam; common fine and medium faint grayish brown (10YR5/2) and few fine faint yellowish brown mottles; moderate medium subangular blocky parting to weak fine angular blocky structure; very hard, very firm; few very fine roots and pores; common pressure faces; few slickensides; thick patchy clay films on faces of peds; estimated 5 percent by volume of white soft masses and fine pitted concretions CaCO3; weak effervescence, mildly alkaline; gradual wavy boundary. (812974).

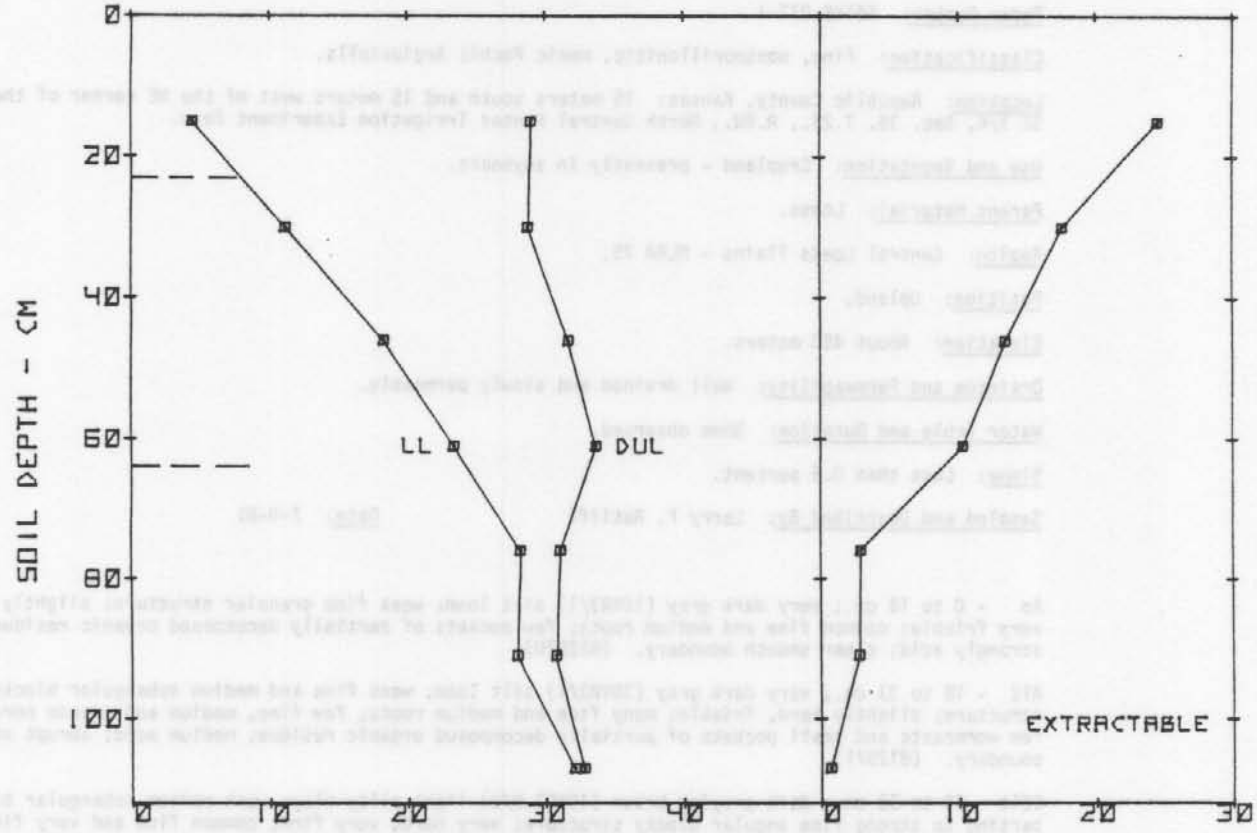
C - 112 to 191 cm.; brown (10YR5/3) silty clay loam; common fine and medium grayish brown (10YR5/2) and common fine distinct dark yellowish brown (10YR4/4) and yellowish brown (10YR5/4) mottles; massive*; hard, friable; few medium pores, common fine and very fine pores; few fine threads and fine pitted concretions CaCO3; weak effervescence, moderately alkaline. (812975, 976).

Remarks: [1/]Pedon is borderline to Typic subgroup and differs from Crete by having an abrupt boundary between the A12 and B21t horizons. *C horizon is massive and compact in place but cores part easily into coarse blocks that have thin patchy clay films and pressure faces on vertical faces of peds. Possibly better described as a buried B horizon. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: R. J. Raney, Kansas State University, North Central Kansas Irrigation Experimental Field, Scandia, Kansas.

Pedon Number: S81KS-077-1

FIELD MEASURED SOIL WATER LIMITS



CRETE TAXADJUNCT-REPUBLIC CO.,KS.-CORN-1975.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	4.4	29.0	24.6
30	11.2	28.8	17.6
46	18.3	31.7	13.4
61	23.4	33.7	10.3
76	28.2	31.1	2.9
91	28.0	30.8	2.8
107	32.1	32.8	0.7

TOTAL WATER EXTRACTED FROM PROFILE = 12.9 Cm.

OCTHAN I

CLASSIFICATION: FINE-LOAMY, SILICEOUS, THERMIC PLINTHIC PALEUDULT

S 81AC-101 -002 SAMPLE NOS. 81P4701 - 4707 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2-.05	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGS (MM) WEIGHT 2-5	COARSE FRAGS (MM) WEIGHT 5-20	COARSE FRAGS (MM) WEIGHT .1-75	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->			
814701	1S	0- 13	AP	4.4	10.7	84.9			6.0	4.7	11.2	34.1	27.7	10.7	1.2	TR	TR	--	74	--
814702	2S	13- 38	A2	5.0	11.4	83.6			5.0	5.8	10.1	33.7	27.9	10.3	1.0	TR	--	--	73	--
814703	3S	38- 48	A3	4.4	10.1	85.5			5.2	4.9	11.0	36.6	27.4	9.4	0.9	TR	TR	--	74	TR
814704	4S	48- 69	B21T	21.8	11.6	66.6			4.5	5.1	7.8	25.9	21.3	10.5	3.1	1	TR	--	61	1
814705	5S	69- 91	B22T	30.8	9.0	60.2			4.9	4.1	7.6	22.7	18.6	9.0	2.3	1	TR	--	53	1
814706	6S	91-117	B23T	34.5	9.3	56.2			4.5	4.8	7.2	20.1	17.5	9.1	2.3	TR	--	--	49	TR
814707	7S	117-163	B24T	37.0	9.6	53.4			5.3	4.3	7.0	19.2	16.5	8.7	2.0	TR	--	--	46	TR

SAMPLE NO.	HZN NO.	ORGN C <- PCT OF <2MM -> 6A1C	TOTAL N 6B3A	EXTR P	TOTAL FE EXTRACTABLE 6R3A	TOTAL AL EXTRACTABLE 6G2B	TOTAL MN EXTRACTABLE 6G7A	DITH-CIT 6G2A	CEC 15 BAR PCT OF <0.4MM 8D1	RATIO/CLAY 1/3 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	BULK DENSITY WHOLE SOIL 4D1	COLE 2-0.06 1/3 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->											<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
814701	1	0.30							0.34	0.43			1.70				3.4			1.9	
814702	2	0.28							0.29	0.45			1.83	1.85	0.004		3.9		5.5	2.5	0.05
814703	3	0.40							0.43	0.41			1.77	1.77	--		3.4		4.8	1.8	0.05
814704	4	0.18							0.14	0.38			1.65	1.67	0.004		9.7		13.8	8.2	0.09
814705	5	0.15							0.12	0.38			1.60	1.63	0.006		13.8		17.0	11.8	0.08
814706	6	0.15							0.13	0.41			1.55	1.60	0.011		16.2		19.6	14.1	0.09
814707	7	0.14							0.11	0.41			1.57	1.60	0.006		16.9		20.5	15.3	0.08

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A 6N2E	MG 5E5A 6Q2D	NA 5E5A 6P2B	K 5E5A 6Q2B	SUM BASES <- MEQ / 100 G ->	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	BASES + AL 5A3B	AL SAT <- PCT -> 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. GHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
814701	1	0.8	0.3	--	0.2	1.3	0.8		2.1	1.5			62	87				5.5	6.1
814702	2	0.7	0.3	--	0.2	1.2	1.0		2.2	1.6			55	75				5.3	6.0
814703	3	0.8	0.2	--	0.1	1.1	1.6		2.7	1.9			41	58				5.2	5.8
814704	4	1.0	0.4	--	0.2	1.6	3.3	0.2	4.9	3.0	1.8	11	33	53				4.7	5.1
814705	5	1.2	0.6	--	0.2	2.0	5.1	0.3	7.1	3.7	2.3	13	28	54				4.8	5.0
814706	6	1.6	0.7	--	0.1	2.4	5.8	0.4	8.2	4.4	2.8	14	29	55				4.7	4.9
814707	7	1.4	0.5	--	0.1	2.0	5.5	0.5	7.5	4.1	2.5	20	27	49				4.6	4.9

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
814701	1								
814702	2	VR 2	KK 2	GI 2	QZ 1	KK12	GI 9	0.8	5.9
814703	3								
814704	4	GI 3	KK 2	VR 2		KK18	GI23	0.6	7.6
814705	5								
814706	6								
814707	7	KK 3	GI 3	VR 2		KK21	GI15	0.4	6.9

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL VR VERMICULITE KK KAOLINITE GI GIBBSITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Dothan taxadjunct[1/].

Pedon Number: S81NC-101-2

Classification: Fine-loamy, siliceous, thermic Plinthic Paleudults.

Location: Johnson County, North Carolina: 2.9 miles northwest on U.S. Highway 70 from its intersection with State Highway 42 in Clayton to entrance of Central Crops Research Station. Site is in field B6 near the center of Plot 2, Rep. 6 of R. P. Patterson's 1980 Soybean Study.

Use and Vegetation: Cropland - presently in corn, previously in soybeans.

Parent Material: Unconsolidated marine sediments.

Region: Southern Coastal Plain - MLRA 133A.

Position: Upland.

Elevation: About 90 meters.

Drainage and Permability: Well drained, moderately slowly permeable.

Water Table and Duration: Perched at about 115 cm. following rains.

Slope: About 1 percent on a slightly convex mid-slope.

Sampled and Described By: Larry F. Ratliff Date: 9-15-81

Ap - 0 to 13 cm.; yellowish brown (10YR5/4) loamy sand; single grain; hard, very friable; many fine and medium roots; few pockets of partially decomposed organic residue; slightly acid; clear smooth boundary. (814701).

A2 - 13 to 38 cm.; yellowish brown (10YR5/4) loamy sand; single grain; hard, very friable; common fine roots, few pockets of sandy clay loam assumed to be brought up by subsoiling activities; medium acid; abrupt smooth boundary. (814702).

A3 - 38 to 48 cm.; brown (10YR4/3) loamy sand; single grain; hard, very friable; few fine roots, few pockets of sandy clay loam; medium acid; clear smooth boundary. (814703).

B21t - 48 to 69 cm.; brownish yellow (10YR6/8) sandy clay loam; few fine distinct reddish yellow (7.5YR6/8) mottles; weak fine and medium subangular blocky structure; very hard, firm; few fine roots; common fine and medium pores; few coarse pores; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary. (814704).

B22t - 69 to 91 cm.; brownish yellow (10YR6/8) sandy clay loam; common medium distinct yellowish red (5YR5/6) mottles some of which have firm red centers; weak fine and medium subangular blocky structure; very hard, firm; few fine roots; common fine and medium pores; few coarse pores; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary. (814705).

B23t - 91 to 117 cm.; yellowish brown (10YR5/8) and brownish yellow (10YR6/8) heavy sandy clay loam; many medium and coarse prominent red (2.5YR4/8) mottles; few fine distinct pale brown (10YR6/3) and light gray (10YR7/2) mottles; weak medium platy parting to weak medium subangular blocky structure; common fine pores; very hard, firm; sand grains and bridged with clay; estimated 3 to 5 percent red platy plinthite; very strongly acid; gradual wavy boundary. (814706).

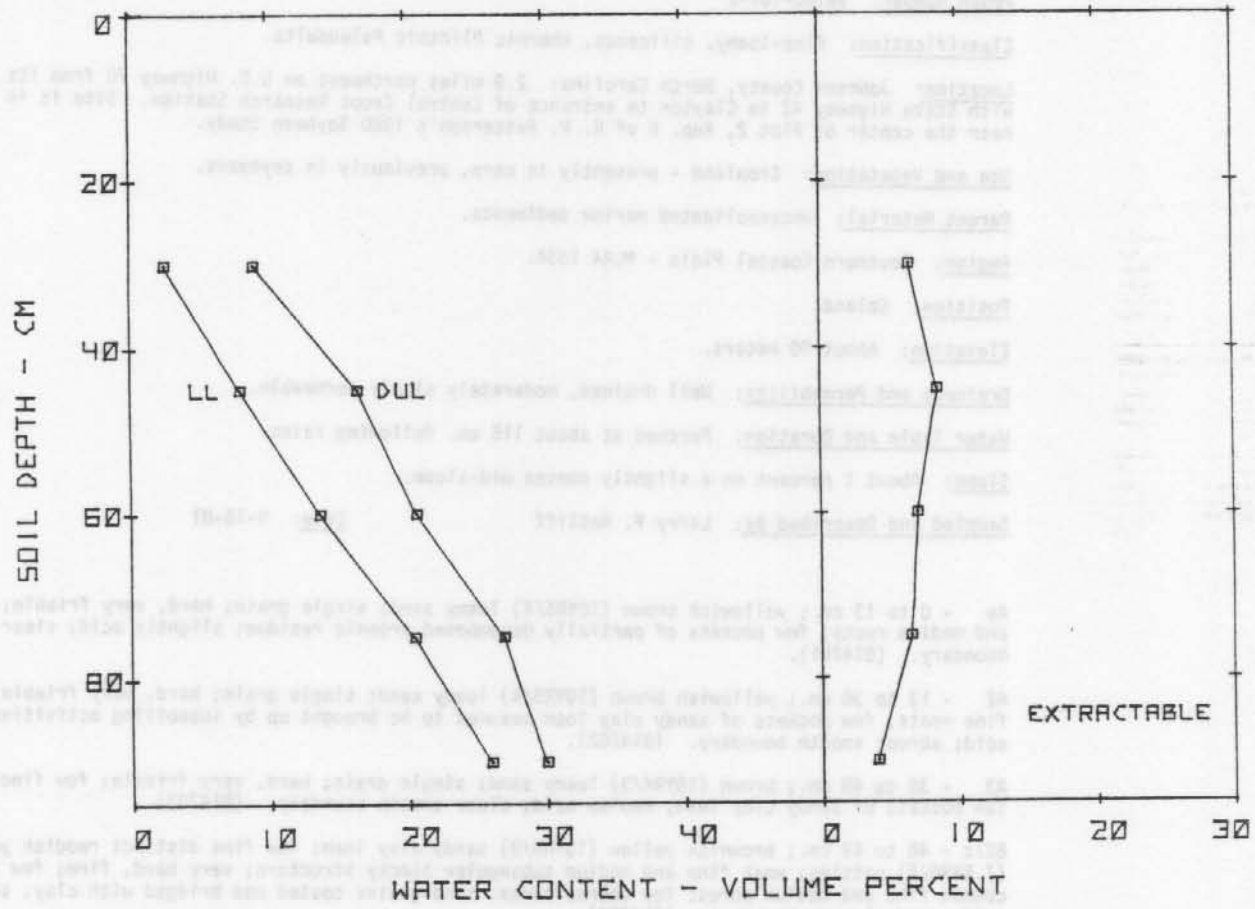
B24t - 117 to 183 cm.; mottled yellowish brown (10YR5/8) brownish yellow (10YR6/8), red (2.5YR4/8), pale brown (10YR6/3) and light gray (10YR7/2) sandy clay; moderate medium platy parting to weak medium subangular blocky structure; very hard, firm, compact and brittle in place; common fine pores, few coarse pores; about 10 percent red platy plinthite; very strongly acid. (814707).

Remarks: [1/]Three pedons about 20 meters apart were observed. All had the zone of organic carbon accumulation immediately above the Bt horizon. Soil differs from Dothan by having thicker A horizons, by having the thin "A3" horizon. These properties are probably the result of deep plowing and liming for many years. Laboratory data not received in time for analysis.

Field Measured Soil Water Data Contributed By: R. P. Patterson, Department of Crop Science, North Carolina State University.

Pedon Number: S81NC-101-2

FIELD MEASURED SOIL WATER LIMITS



DOTHAN TAXADJ.-JOHNSON CO.,NC.-SOYBEANS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	2.5	9.0	6.5
45	8.0	16.5	8.5
60	13.7	20.7	7.0
75	20.5	27.0	6.5
90	26.0	30.0	4.0

TOTAL WATER EXTRACTED FROM PROFILE = 6.3 Cm.

FORESTON

CLASSIFICATION: COARSE-LOAMY, SILICEOUS, THERMIC AQUIC PALEUDULT

S 81NC-015 -001 SAMPLE NOS. 81P4713 - 4718 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	-1- TOTAL CLAY LT .002	-2- TOTAL SILT .002 -.05	-3- TOTAL SAND .05 -2	-4- CLAY FINE LT .0002	-5- CLAY CO3 LT .002	-6- SILT FINE .002 -.02	-7- SILT COARSE .02 -.05	-8- SAND VF .05 -.10	-9- SAND F .10 -.25	-10- SAND M .25 -.50	-11- SAND C .5 -1	-12- SAND VC 1 -2	-13- COARSE FRACTIONS (MM) WEIGHT 2 -5	-14- WEIGHT 5 -20	-15- WEIGHT 20 -75	-16- WEIGHT .1- 75	-17- (>2MM) WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM (3B1)			->	
814713	1S	0- 25	AP	2.8	12.2	85.0			6.5	5.7	16.3	23.8	20.7	18.3	5.9	2	1	--	70	3
814714	2S	25- 41	A2	3.6	18.8	77.6			12.1	6.7	17.7	20.6	15.8	17.9	5.6	3	1	--	62	4
814715	3S	41- 71	B21T	9.7	16.5	73.8			10.9	5.6	15.9	19.1	14.3	16.0	8.5	4	1	--	60	5
814716	4S	71- 97	B22T	12.9	13.3	73.8			7.7	5.6	13.9	19.3	15.6	17.4	7.6	3	1	--	62	4
814717	5S	97-137	B3	15.4	11.7	72.9			6.9	4.8	17.4	23.3	12.0	13.9	6.3	2	TR	--	56	2
814718	6S	137-163	C	21.9	11.5	66.6			5.7	5.8	26.6	24.1	5.6	7.0	3.3	1	TR	--	41	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
814713	1	0.39							0.61	0.43			1.88	1.89		0.002	2.8		4.6	1.2	0.06
814714	2	0.15							0.19	0.28			1.81	1.81		--	3.8		6.0	1.0	0.09
814715	3	0.15							0.24	0.39			1.84	1.85		0.002	6.3		9.0	3.8	0.09
814716	4	0.12							0.23	0.39			1.84	1.87		0.005	7.6		9.8	5.0	0.09
814717	5	0.11							0.23	0.40			1.67	1.75		0.016	8.8		17.5	6.2	0.19
814718	6	0.12							0.21	0.41			1.62	1.70		0.016	12.5		19.8	8.9	0.18

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	NH4-OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	NH4 CAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- MEQ / 100 G									->	<- PCT		->					
814713	1	0.9	0.1	--	0.1	1.1	1.2		2.3	1.7			48	65				5.1	5.6
814714	2	0.2	TR	--	TR	0.2	0.6	0.2	0.8	0.7	0.4	50	25	29				4.6	5.0
814715	3	0.7	0.4	TR	0.2	1.3	1.5	0.4	2.8	2.3	1.7	24	46	57				4.6	4.8
814716	4	0.7	0.3	TR	0.2	1.2	2.6	1.2	3.8	3.0	2.4	50	32	40				4.3	4.5
814717	5	0.7	0.2	--	0.1	1.0	3.1	1.8	4.1	3.5	2.8	64	24	29				4.2	4.4
814718	6	1.0	0.2	0.2	0.2	1.6	5.0	2.6	6.6	4.7	4.2	62	24	34				4.1	4.3

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A21	7A21	7A21	7A21	DTA <2U 7A3	7A3	TOT ANL CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- PCT	->
814713	1								
814714	2	VR 2	KK 2	MI 1	QZ 1			0.4	1.4
814715	3								
814716	4	KK 3	VR 2	GI 1	MI 1	KK31	GI 1	0.8	3.6
814717	5								
814718	6	KK 4	MI 2	VR 1	GE 1	KK55	GI	1.0	3.0

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL VR VERMICULITE KK KAOLINITE MI MICA QZ QUARTZ GI GIBBSITE
GE GOETHITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Foreston.

Pedon Number: S81NC-015-1

Classification: Coarse-loamy, siliceous, thermic Aquic Paleudults.

Location: Bertie County, North Carolina: 0.5 mile southwest on State Highway 42 from the entrance of the Peanut Belt Research Station at Lewiston, then 0.25 mile west on paved road and 0.1 mile north on dirt road to barn. Site is 30 meters north of barn in field.

Use and Vegetation: Cropland - presently fallow, previously cropped to corn.

Parent Material: Unconsolidated marine sediments.

Region: Atlantic Coast Flatwoods - MLRA 153A.

Position: Upland terrace.

Elevation:

Drainage and Permeability: Moderately well drained, moderately slowly permeable.

Water Table and Duration: Perched at about 100 cm. following rains.

Slope: 0.5 percent on a convex upper side slope.

Sampled and Described By: Larry F. Ratliff Date: 9-17-81

Ap - 0 to 25 cm.; brown (10YR4/3) loamy sand; single grain; slightly hard, friable; common fine and medium roots; few pockets of partially decomposed organic residue; medium acid; clear wavy boundary. (814713).

A2 - 25 to 41 cm.; pale brown (10YR6/3) loamy sand; few fine distinct brownish yellow (10YR6/6) mottles; single grain; very hard, slightly firm and brittle in place; few fine roots; few medium and coarse pores; very strongly acid; clear wavy boundary. (814714).

B21t - 41 to 71 cm.; light yellowish brown (10YR6/4) and brownish yellow (10YR6/6) sandy loam; few medium and coarse distinct strong brown (7.5YR5/6) mottles; weak fine subangular blocky structure; very hard, friable; few coarse pores; few coarse fragments mostly less than 5 mm. in diameter; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary. (814715).

B22t - 71 to 97 cm.; brownish yellow (10YR6/6) sandy loam; many medium and coarse distinct light brownish gray (10YR6/2) and few fine faint strong brown mottles; weak fine subangular blocky structure; very hard, friable; few coarse pores; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary. (814716).

B3 - 97 to 137 cm.; light brownish gray (10YR6/2) and light gray (10YR7/2) sandy loam; common fine and medium prominent reddish yellow (7.5YR6/8) mottles which are more sandy than gray parts; moderate medium subangular blocky structure; few coarse pores; sand grains coated and bridged with clay; extremely acid; gradual wavy boundary. (814717).

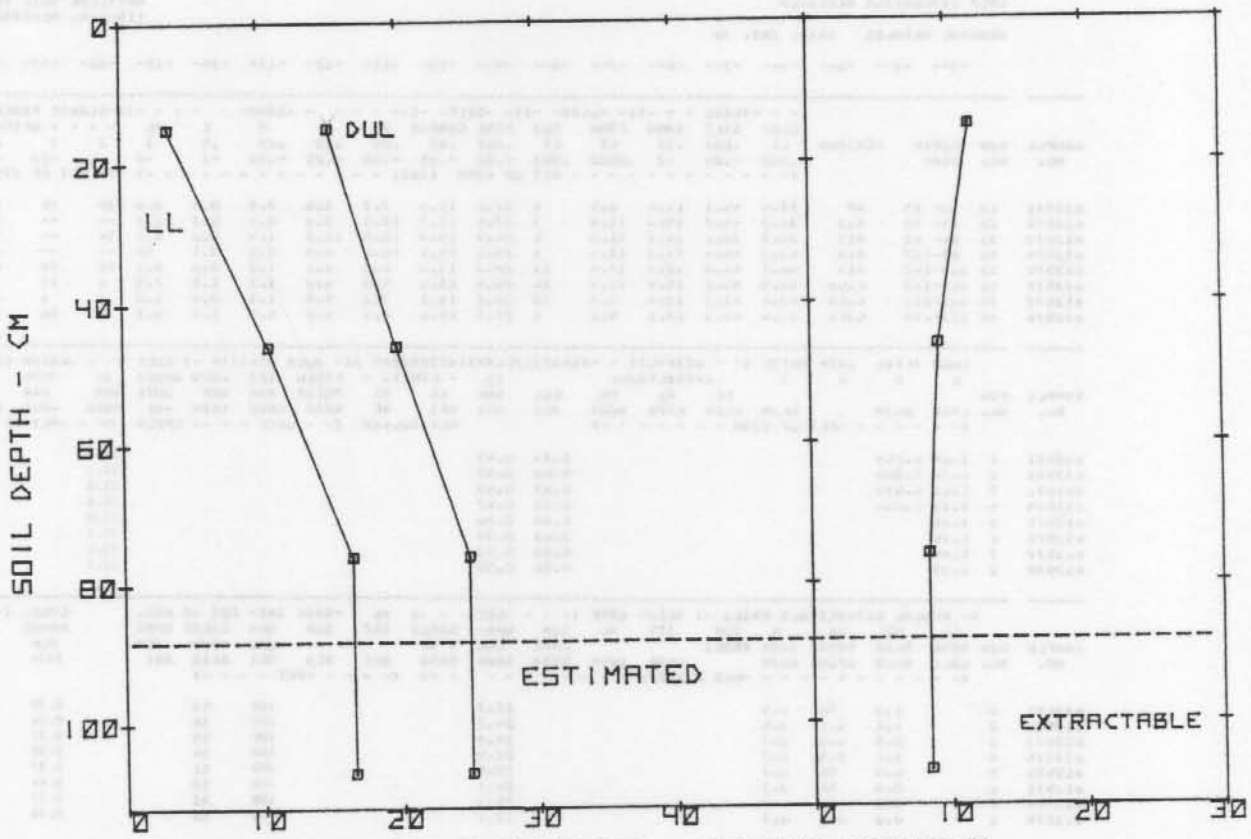
C - 137 to 183 cm.; light gray (10YR7/2) and light brownish gray (10YR6/2) sandy clay loam; many medium and coarse prominent reddish yellow (7.5YR6/8) mottles that are more sandy than gray parts; massive; very hard, firm; few coarse pores; extremely acid. (814718).

Remarks: Colors are for moist soil. Sand grains in horizons feel angular. Laboratory data not received in time for analysis.

Field Measured Soil Water Data Contributed By: F. R. Cox, Department of Soil Science, North Carolina State University.

Pedon Number: S81NC-015-1

FIELD MEASURED SOIL WATER LIMITS



FORESTON LS-BERTIE CO., N.C.-PEANUTS-1980.

SOIL DEPTH Cm	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	3.4	15.1	11.7
46	10.6	19.9	9.3
76	16.6	25.1	8.5

TOTAL WATER EXTRACTED FROM PROFILE = 9.0 Cm.

FRIO T

CLASSIFICATION: FINE, MONTMORILLONITIC, THERMIC CUMULIC HAPLUSTOLL

S 81TX-027-006 SAMPLE NOS. 81P3571 - 3578 DATE 06/28/82

CROP EVALUATION RESEARCH

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS (MM) WEIGHT 2-5	WEIGHT 5-20	WEIGHT 20-75	WEIGHT .1-75 PCT OF <75MM (3B1)	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM (3B1)			->	
813571	1S	0- 15	AP	37.4	49.1	13.5	8.5	6	33.2	15.9	7.7	3.8	0.9	0.5	0.6	TR	TR	--	6	TR
813572	2S	15- 64	A12	36.3	44.7	19.0	11.8	7	27.4	17.3	12.1	5.8	0.9	0.2	0.1	--	--	--	7	--
813573	3S	64- 83	A13	36.7	39.2	24.1	11.0	6	24.9	14.3	10.9	11.0	1.9	0.2	0.1	TR	--	--	13	--
813574	4S	83-127	A14	40.3	44.4	15.3	11.9	8	29.3	15.1	10.1	4.5	0.6	0.1	TR	--	--	--	5	--
813575	5S	127-165	A15	46.7	41.0	12.3	14.4	11	28.0	13.0	6.3	4.1	1.2	0.6	0.1	TR	TR	--	6	TR
813576	6S	165-183	C1CA	44.4	40.2	15.4	11.7	10	26.6	13.6	5.8	4.3	1.5	1.5	2.3	6	12	3	29	21
813577	7S	183-213	C2CA	43.4	41.2	15.4	9.3	10	26.1	15.1	7.2	5.0	1.3	0.9	1.0	1	4	--	13	5
813578	8S	213-254	C3CA	39.4	43.5	17.1	9.2	9	27.7	15.8	8.4	5.8	1.5	0.7	0.7	1	TR	--	10	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
813571	1	1.24	0.104						0.74	0.43							22.8			16.1	
813572	2	0.78	0.066						0.68	0.42							22.3			15.4	
813573	3	0.61	0.053						0.67	0.45							22.0			16.4	
813574	4	1.17	0.095						0.72	0.47							26.8			18.6	
813575	5	1.31							0.64	0.40							27.0			18.8	
813576	6	0.76							0.63	0.39							25.2			17.1	
813577	7	0.49							0.56	0.37							23.1			16.2	
813578	8	0.35							0.56	0.39							21.7			15.2	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	BASE SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- MEQ / 100 G									->	<- PCT			->				
813571	1		1.3	TR	0.9					27.7				100	53		0.39	7.6	7.9
813572	2		1.1	0.1	0.6					24.7				100	56		0.34	7.6	8.0
813573	3		0.9	0.1	0.7					24.6				100	55		0.33	7.7	8.1
813574	4		1.0	0.4	0.7					28.9				100	54		0.38	7.6	8.1
813575	5		0.9	TR	0.7					29.9				100	51		0.37	7.6	8.0
813576	6		0.9	TR	0.7					26.1				100	53		0.44	7.6	7.9
813577	7		0.9	TR	0.7					25.3				100	52		0.37	7.7	8.0
813578	8		0.8	0.1	0.7					22.1				100	52		0.29	7.8	8.1

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A21	7A21	7A21	7A21	DTA 7A3	7A3	TOT ANL CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS			->	<- PCT			->
813571	1								
813572	2								
813573	3	MT 5	CA 2	MI 1	KK 1			1.2	3.6
813574	4								
813575	5	MT 4	CA 2	MI 2	KK 1			1.2	3.4
813576	6								
813577	7	MT 4	MI 2	CA 2	KK 1			1.5	3.5
813578	8								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL CA CALCITE MI MICA KK KAOLINITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Frio taxadjunct[1/].

Pedon Number: S81TX-027-6

Classification: Fine, montmorillonitic, thermic Cumulic Haplustolls[1/].

Location: Bell County, Texas: 150 meters northwest from Taylor's Valley Church on FM 1741, then 0.5 mile south and 0.35 east on paved road to metal gate. Site is 200 meters south on field road and 15 meters east in field.

Use and Vegetation: Cropland - presently in grain sorghum.

Parent Material: Alluvium.

Region: Grand Prairie - MLRA 85.

Position: Terrace.

Elevation: ----------.

Drainage and Permeability: Well drained and moderately slowly permeable.

Water Table and Duration: None.

Slope: About 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-30-81

Ap - 0 to 15 cm.; very dark grayish brown (10YR3/2) silty clay loam; massive; hard, friable; common fine and medium roots and pores; few small fragments of shell; strong effervescence, moderately alkaline; clear smooth boundary. (813571).

A12 - 15 to 64 cm.; very dark grayish brown (10YR3/2) silty clay loam; weak fine and medium subangular blocky structure; hard, friable; common fine and medium roots and pores; few small fragments of shell; strong effervescence, moderately alkaline; clear smooth boundary. (813572).

A13 - 64 to 83 cm.; dark grayish brown (10YR3.5/2) clay loam; weak fine and medium subangular blocky structure; hard, friable; many thin strata and pockets of brown (10YR4/3,5/3) loam; common fine roots; few fine and medium pores; few small fragments of shell; strong effervescence, moderately alkaline; clear wavy boundary. (813573).

A14 - 83 to 127 cm.; very dark gray (10YR3/1) silty clay; weak fine and medium subangular blocky structure; hard, friable; few fine roots; few fine and medium pores; few small fragments of shell; violent effervescence, moderately alkaline; gradual wavy boundary. (813574).

A15 - 127 to 165 cm.; very dark gray (10YR3/1) silty clay; moderate fine and medium subangular blocky structure; hard, friable; few fine roots; few fine pores; few small fragments of shell; violent effervescence, moderately alkaline; clear wavy boundary. (813575).

C1ca - 165 to 183 cm.; very dark grayish brown (10YR3/2) silty clay; weak fine subangular blocky structure; hard, friable; few fine roots and pores; estimated 20 percent by volume of weakly cemented, platy $CaCO_3$ - plates can be broken with fingers; violent effervescence, moderately alkaline; gradual wavy boundary. (813576).

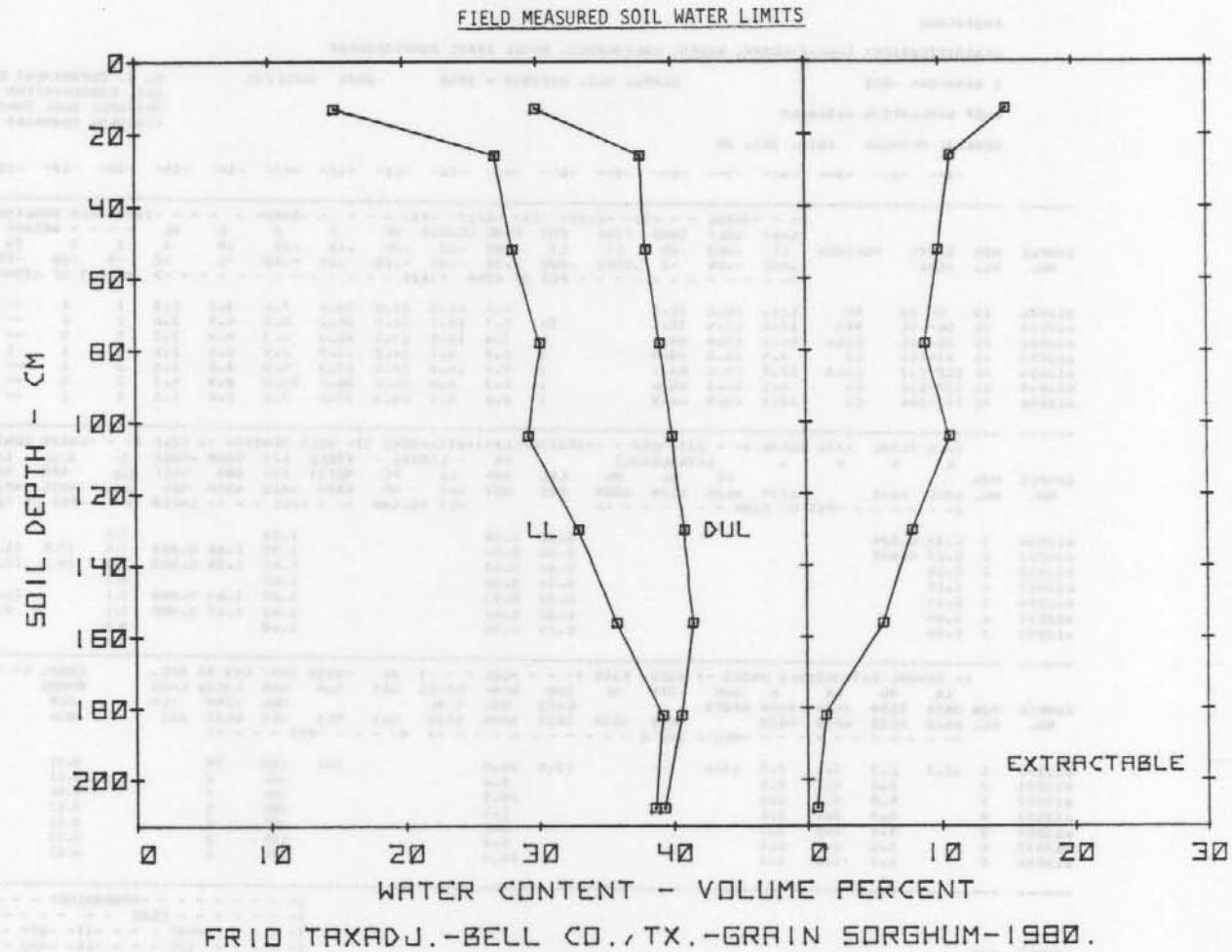
C2ca - 183 to 213 cm.; dark grayish brown (10YR4/2) silty clay; moderate medium subangular blocky structure; very hard, firm; few fine pores; common pressure faces on peds; about 5 to 10 percent by volume of platy and rounded $CaCO_3$ concretions; violent effervescence, moderately alkaline; gradual wavy boundary. (813577).

C3ca - 213 to 254 cm.; grayish brown (10YR4/2) silty clay loam; few fine faint yellowish brown mottles; moderate medium subangular blocky structure; very hard, firm; few fine pores; common pressure faces on peds; about 5 percent by volume of fine concretions $CaCO_3$; few fragments of shell; violent effervescence, moderately alkaline. (813578).

Remarks: 1/ Differs from Frio by having montmorillonitic mineralogy. Use and interpretation expected to be similar to Frio. Primary structure of all A horizons part to very fine granular. The Clca horizon is discontinuous within pit. Bulk density analyses are being made locally. Colors are for moist soil. Laboratory data not received in time to include in analysis.

Field Measured Soil Water Data Contributed By: Dan R. Upchurch, USDA-AR, Grassland, Soil and Water Research Laboratory, Temple, Texas.

Pedon Number: S81TX-027-6



SOIL DEPTH Cm	LL	DUL	EXTRACTABLE
	Volume Percent Water		
13	14.9	29.9	15.0
26	26.9	37.7	10.8
52	28.2	38.1	9.9
78	30.2	39.1	8.9
104	29.3	40.0	10.7
130	33.0	40.9	7.9
156	35.8	41.5	5.7
182	39.2	40.6	1.4
208	38.6	39.3	0.7

TOTAL WATER EXTRACTED FROM PROFILE = 16.8 Cm.

FRUITLAND

CLASSIFICATION: COARSE-LOAMY, MIXED, CALCAREOUS, MESIC TYPIC TORRIORTHENT

S 81NM-045 -001 SAMPLE NOS. 81P3550 - 3556 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.5	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
813550	1S	0- 10	AP	12.3	16.0	71.7			4.5	11.5	25.0	34.6	7.6	3.2	1.3	1	1	--	48	2
813551	2S	10- 51	A12	11.1	16.4	72.5		TR	5.7	10.7	22.2	34.2	8.6	4.9	2.6	2	2	--	52	4
813552	3S	51- 81	C1CA	11.9	19.8	68.3		2	7.8	12.0	23.1	30.9	6.3	4.3	3.7	5	5	--	51	10
813553	4S	81-102	C2	9.4	11.6	79.0		1	5.3	6.3	34.2	37.7	2.9	2.6	1.6	1	1	1	46	3
813554	5S	102-137	C3CA	12.7	24.2	63.1		3	9.4	14.8	23.6	27.3	5.0	3.8	3.4	2	1	--	41	3
813555	6S	137-191	C4	8.1	13.3	80.6		1	5.3	8.0	16.6	36.6	14.0	8.9	4.5	2	1	--	65	3
813556	7S	191-244	C5	12.7	18.5	68.8		1	8.6	9.9	20.9	35.8	7.2	2.8	2.1	1	1	--	49	2

SAMPLE NO.	HZN NO.	TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6K3A	DITH-CIT FE 6C2B	DITH-CIT AL 6G7A	DITH-CIT MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- 0.06 BAR 4A1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
813550	1	0.33	0.034						0.81	0.46				1.50			7.4			5.7	
813551	2	0.27	0.032						0.86	0.54				1.55	1.64	0.019	7.9	17.8	11.9	6.0	0.09
813552	3	0.26							0.88	0.52				1.45	1.54	0.019	8.9	19.2	15.2	6.2	0.12
813553	4	0.15							0.78	0.60				1.60			6.5			5.6	
813554	5	0.14							0.72	0.53				1.60	1.64	0.008	9.1		13.1	6.7	0.10
813555	6	0.09							1.02	0.62				1.62	1.63	0.002	5.1		8.0	3.8	0.07
813556	7	0.09							1.15	0.50				1.60			8.9			6.3	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	NH4OAC EXTRACTABLE BASES MG 5B5A 6Q2D	NH4OAC EXTRACTABLE BASES NA 5B5A 6P2B	NH4OAC EXTRACTABLE BASES K 5B5A 6Q2B	NH4OAC EXTRACTABLE BASES SUM BASES	ACID-ITY 6H3A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. GHMS /CM 6E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - -PCT - - - ->							1:2	1:1
813550	1	10.3	2.5	0.1	0.7	13.6	--		13.6	10.0			100	100	TR		0.73		7.6	8.2
813551	2		3.2	0.1	0.4					9.8				100	2		0.47		7.7	8.4
813552	3		5.0	0.1	0.2					10.5				100	7		0.46		7.8	8.4
813553	4		4.7	0.1	0.2					7.3				100	5		0.43		7.8	8.6
813554	5		5.6	0.8	0.2					9.2				100	8		0.63		8.0	8.9
813555	6		3.6	0.9	0.1					6.2				100	2		0.73		7.8	9.1
813556	7		4.3	1.8	0.2					14.6				100	3		0.82		7.9	9.1

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A21	MINERALOGY CLAY X-RAY <2U 7A21	MINERALOGY CLAY X-RAY <2U 7A21	MINERALOGY CLAY X-RAY <2U 7A21	MINERALOGY CLAY -OTA- <2U 7A3	MINERALOGY CLAY -OTA- <2U 7A3	TOT ANL CLAY K2O 603A	TOT ANL CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
813550	1								
813551	2	MT 3	MI 3	KK 3	CA 1	KK15		2.3	4.2
813552	3								
813553	4	MI 3	KK 2	MI 2	CA 2	KK 7		1.4	3.2
813554	5								
813555	6	MT 3	MI 2	KK 1	CA 1	KK 3		1.6	3.5
813556	7								

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 10 PCT .1-75MM 50

ESTIMATED BULK DENSITY FOR LAYER 1, 4, 7,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Fruitland.

Pedon Number: S81NM-045-1

Classification: Coarse-loamy, mixed, calcareous, mesic Typic Torriorthents.

Location: San Juan County, New Mexico: (Legal description not available). Site sampled is between Tube 15 (Alfalfa) and Tube 1 (Barley) of the T. W. Sammis 1981 Line Source Experiment on the San Juan Branch Experiment Station.

Use and Vegetation: Cropland - presently fallow.

Parent Material: Old alluvium from sandstone.

Region: San Juan River Valley Mesas and Plateaus - MLRA 37.

Position: Upland.

Elevation: About 1700 meters.

Drainage and Permeability: Well drained, moderately rapid permeability.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-20-81

Ap - 0 to 10 cm.; light brown (7.5YR6/4) fine sandy loam, brown (7.5YR4/4) moist; massive; slightly hard, very friable; few coarse fragments less than 1 cm. in diameter; few pockets of calcareous material; moderately alkaline; clear smooth boundary. (813550).

A12 - 10 to 51 cm.; light brown (7.5YR6/4) fine sandy loam, brown (7.5YR4/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few rounded coarse fragments less than 1 cm. in diameter; weak effervescence, moderately alkaline; clear wavy boundary. (813551).

C1ca - 51 to 81 cm.; light brown (7.5YR6/4) fine sandy loam, brown (7.5YR5/4) moist; massive; hard, very friable; estimated 5 to 10 percent by volume of rounded coarse fragments that are partially coated with white CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (813552).

C2 - 81 to 102 cm.; reddish yellow (7.5YR6/6) light very fine sandy loam; strong brown (7.5YR5/6) moist; massive; hard, very friable; few fine (< .5 cm.) coarse fragments; violent effervescence, strongly alkaline; clear wavy boundary. (813553).

C3ca - 102 to 137 cm.; light yellowish brown (10YR6/4) fine sandy loam, yellowish brown (10YR5/4) moist; massive; hard, very friable; few thin lamella; estimated 5 percent by volume white soft masses CaCO3; violent effervescence, strongly alkaline; gradual wavy boundary. (813554).

C4 - 137 to 191 cm.; light brown (7.5YR6/4) loamy sand, brown (7.5YR5/4) moist; massive; hard, very friable; few fine coarse fragments; violent effervescence, strongly alkaline; gradual wavy boundary. (813555).

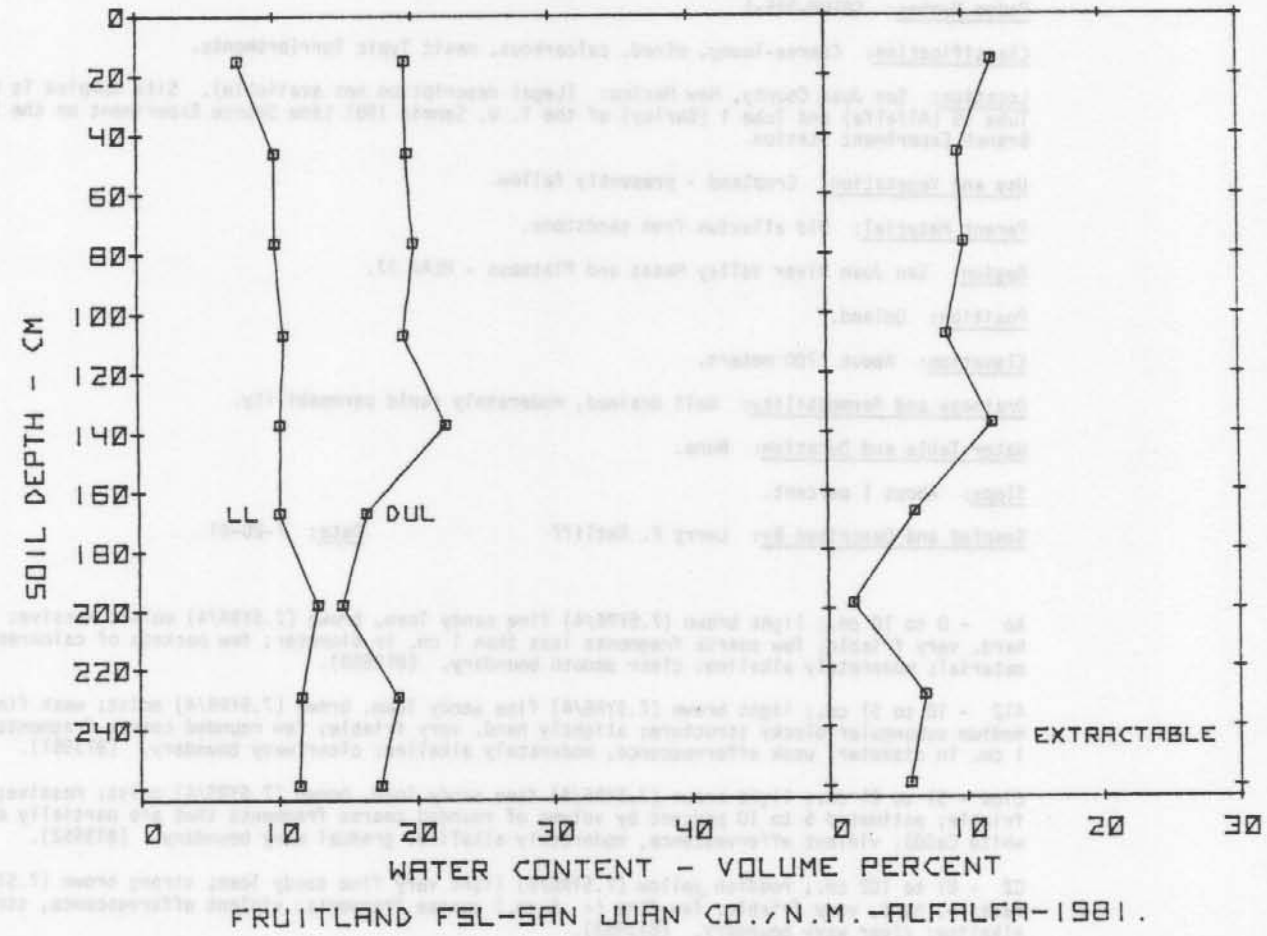
C5 - 191 to 244 cm.; brownish yellow (10YR6/6) fine sandy loam, yellowish brown (10YR5/6) moist; massive; hard, very friable; few thin lamella; violent effervescence, strongly alkaline. (813556).

Remarks: Laboratory data not received in time to include in analysis.

Field Measured Soil Water Data Contributed By: T. W. Sammis, Agricultural Engineering Department, New Mexico State University.

Pedon Number: S81NM-045-1

FIELD MEASURED SOIL WATER LIMITS



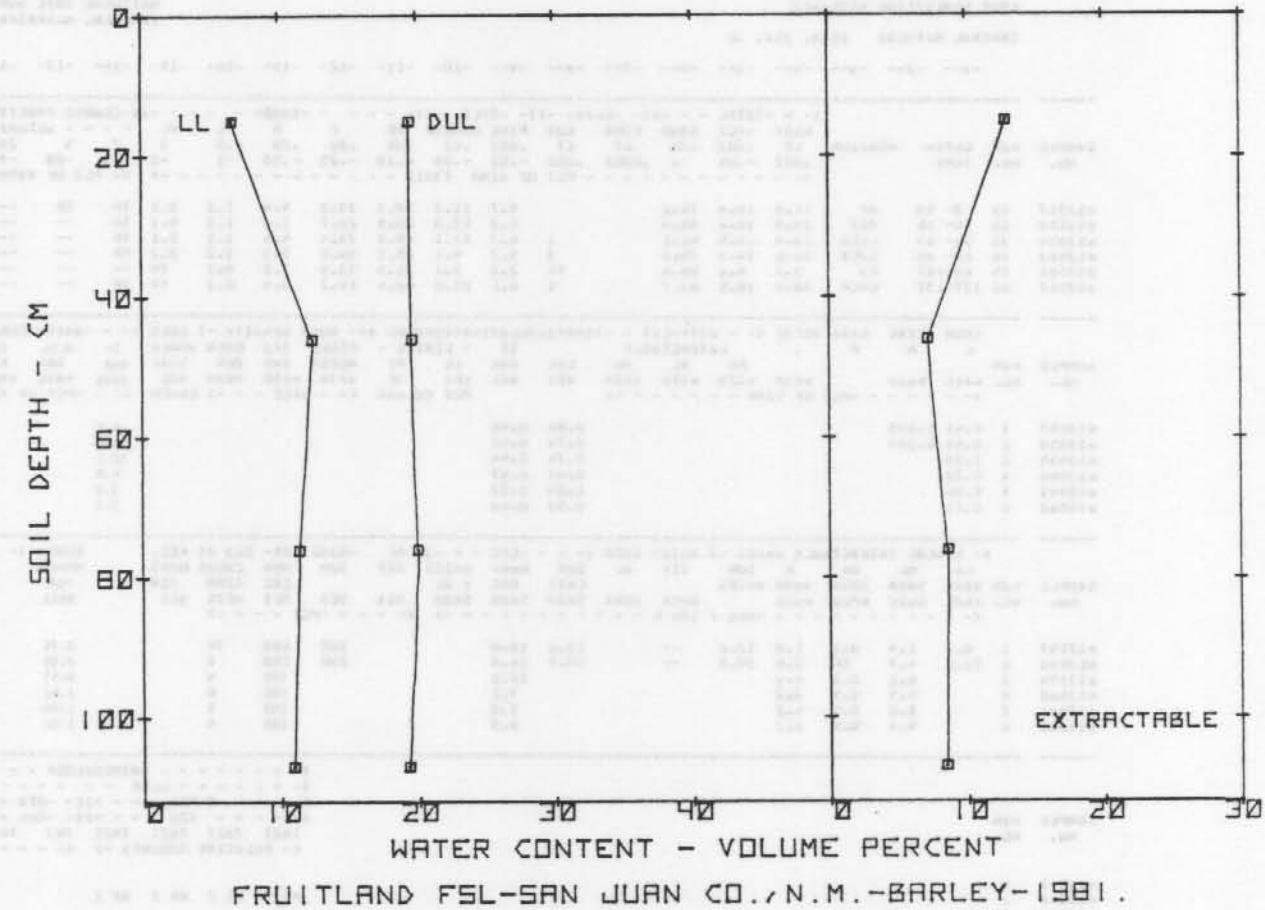
FRUITLAND FSL-SAN JUAN CO./N.M.-ALFALFA-1981.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	7.4	19.5	12.1
46	10.0	19.6	9.6
76	10.0	20.0	10.0
107	10.6	19.3	8.7
137	10.3	22.3	12.0
167	10.2	16.5	6.3
198	12.9	14.7	1.8
229	11.7	18.7	7.0
259	11.5	17.4	5.9

TOTAL WATER EXTRACTED FROM PROFILE = 22.3 Cm.

Pedon Number: S81NM-045-1

FIELD MEASURED SOIL WATER LIMITS



FRUITLAND FSL-SAN JUAN CO., N.M.-BARLEY-1981.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	6.6	19.5	12.9
46	12.4	19.6	7.2
76	11.4	20.0	8.6
107	10.9	19.3	8.4

TOTAL WATER EXTRACTED FROM PROFILE = 11.4 Cm.

FRUITLAND

CLASSIFICATION: COARSE-LOAMY, MIXED, CALCAREOUS, MESIC TYPIC TORRIORTHENT

S 81AM-045 -002 SAMPLE NOS. 81P3557 - 3562 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2	5	20	>2MM WT .1-75	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
813557	1S	0- 10	AP	11.9	16.9	71.2			5.7	11.2	32.5	33.0	4.4	1.2	0.1	TR	TR	--	39	--
813558	2S	10- 36	A12	17.9	18.2	63.9			6.2	12.0	28.5	28.7	3.6	1.0	0.1	TR	--	--	33	--
813559	3S	36- 69	C1CA	16.5	21.4	62.1		1	8.3	13.1	30.1	26.4	4.4	1.1	0.1	TR	--	--	32	--
813560	4S	69- 89	C2CA	10.6	14.8	74.6		3	5.7	9.1	25.1	34.0	7.3	3.0	0.2	TR	--	--	49	--
813561	5S	89-127	C3	9.3	6.1	88.6		TR	2.0	4.1	31.5	53.9	3.0	0.2	TR	--	--	--	57	--
813562	6S	127-152	C4CA	10.2	28.1	63.7		1	6.1	20.0	48.4	14.2	0.9	0.2	TR	TR	--	--	15	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C -PCT	TOTAL N 6B3A -PCT	EXTR P	TOTAL S 6K3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6G2A	CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B2A	15 BAR 4C1	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
813557	1	0.41	0.035						0.84	0.45							6.9		5.3		
813558	2	0.44	0.049						0.74	0.42							11.0		8.3		
813559	3	0.39							0.74	0.44							10.1		7.3		
813560	4	0.26							0.67	0.47							6.8		5.0		
813561	5	0.06							1.04	0.57							3.9		3.0		
813562	6	0.11							0.93	0.48							7.2		4.9		

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6A2G	NA 5B5A 6P2D	K 5B5A 6A2B	SUM BASES	ACID-ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	CEC + AL BASES 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->							
813557	1	8.7	2.4	0.1	1.0	12.2	--		12.2	10.6			100	100	TR		0.76	7.5	8.2
813558	2	25.2	4.7	TR	0.6	30.5	--		30.5	14.8			100	100	1		0.59	7.8	8.3
813559	3		6.0	0.3	0.3					12.2				100	4		0.53	8.0	8.5
813560	4		4.5	0.5	0.2					7.1				100	6		1.02	7.9	8.5
813561	5		3.0	0.5	0.2					5.8				100	1		1.08	7.9	8.5
813562	6		4.4	0.9	0.2					9.5				100	4		1.52	7.9	8.5

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	7A3	7A3	TOT ANL 7C3 CLAY -DTA <2U K20 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
813557	1								
813558	2	MT 3	MI 2	KK 2	QZ 1			2.4	4.3
813559	3								
813560	4	MT 3	KK 2	CA 2	MI 2	KK 8		1.2	2.6
813561	5								
813562	6	MI 3	MI 2	KK 2	CA 1	KK 7		1.9	3.7

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Fruitland.

Pedon Number: S81NM-045-2

Classification: Coarse-loamy, mixed, calcareous, mesic Typic Torriorthents.

Location: San Juan County, New Mexico: (Legal description not available). Site sampled is near Tube #15 of the 1980 Barley East Plot (196 kg N/ha) of the T. W. Sammis 1980 Line Source Study on the San Juan Branch Experiment Station.

Use and Vegetation: Cropland - presently fallow.

Parent Material: Old alluvium from sandstone.

Region: San Juan River Valley Mesas and Plateaus - MLRA 37.

Position: Upland.

Elevation: About 1700 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-21-81

Ap - 0 to 10 cm.; light brown (7.5YR6/4) very fine sandy loam, brown (7.5YR4/4) moist; massive; slightly hard, friable; many fine roots; moderately alkaline; clear smooth boundary. (813557).

A12 - 10 to 36 cm.; brown (7.5YR5/4) very fine sandy loam, brown (7.5YR4/4) moist; weak fine and medium subangular blocky structure; hard, friable; many fine roots; common fine pores; weak effervescence in spots; moderately alkaline; clear wavy boundary. (813558).

C1ca - 36 to 69 cm.; light brown (7.5YR6/4) very fine sandy loam, brown (7.5YR4/4) moist; massive; very hard, friable; common fine roots; common fine and medium pores; common fine threads and soft masses of white $CaCO_3$; violent effervescence, strongly alkaline; gradual wavy boundary. (813559).

C2ca - 69 to 89 cm.; light brown (7.5YR6/4) fine sandy loam, brown (7.5YR5/4) moist; massive; hard, friable; common fine threads and soft masses of white $CaCO_3$; violent effervescence, strongly alkaline; clear wavy boundary. (813560).

C3 - 89 to 127 cm.; light brown (7.5YR6/4) loamy fine sand, brown (7.5YR5/4) moist; massive; hard, friable; occasional fine threads and soft masses of white $CaCO_3$; violent effervescence, strongly alkaline; clear wavy boundary. (813561).

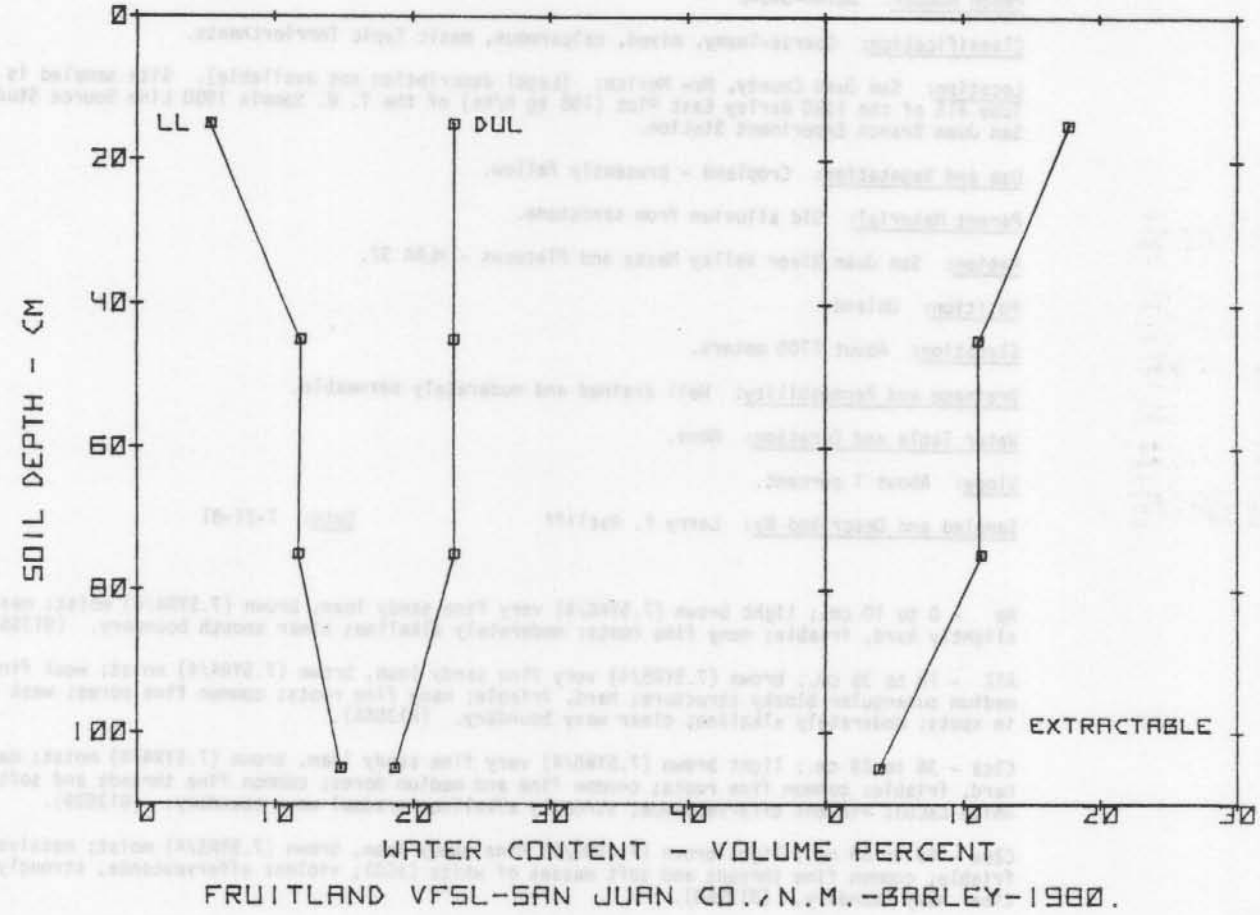
C4ca - 127 to 152 cm.; light brown (7.5YR6/4) very fine sandy loam; brown (7.5YR5/4) moist; massive; hard, friable; very compact in place but parts into plates that are brittle when dry; few fine pores; common fine threads of white $CaCO_3$; violent effervescence, strongly alkaline. (813562).

Remarks: Soil is very dry and core samples were not collected. Laboratory data not received in time to include in analysis.

Field Measured Soil Water Data Contributed By: T. W. Sammis, Agricultural Engineering Department, New Mexico State University.

Pedon Number: S81NM-045-2

FIELD MEASURED SOIL WATER LIMITS



FRUITLAND VFSL-SAN JUAN CO.,N.M.-BARLEY-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
15	5.3	23.0	17.7
45	11.9	23.0	11.1
75	11.7	23.0	11.3
105	14.8	18.7	3.9

TOTAL WATER EXTTACTED FROM PROFILE = 13.2 Cm.

GERBER

CLASSIFICATION: FINE, MONTMORILLONITIC, FRIGID, UDORTHENTIC CHROMUSTERT

S 80MT-015-003 SAMPLE NOS. 80P2296 - 2304 DATE 06/28/82

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	-1- TOTAL CLAY LT .002	-2- TOTAL SILT .002-.05	-3- TOTAL SAND .05-2	-4- CLAY FINE LT .0002	-5- CLAY CO3 LT .002	-6- SILT FINE .002-.02	-7- SILT COARSE .02-.05	-8- SAND VF .05-.10	-9- SAND F .10-.25	-10- SAND M .25-.50	-11- SAND C .5-1	-12- SAND VC 1-2	-13- WEIGHT 2-5	-14- WEIGHT 5-20	-15- WEIGHT 20-75	-16- WEIGHT .1-75	-17- >2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)												<- PCT OF <75MM(3B1) ->				
80P2296	1S	0- 13	AP	46.7	37.3	16.0			22.3	15.0	6.8	4.7	1.5	0.4	0.6	TR	1	--	8	1
80P2297	2S	13- 28	B21T	53.3	32.6	14.1			19.9	12.7	8.7	3.8	1.1	0.4	0.1	TR	TR	--	5	--
80P2298	3S	38- 53	B22T	38.1	38.9	23.0		5	23.6	15.3	11.9	8.8	1.9	0.3	0.1	TR	--	--	11	--
80P2299	4S	69- 84	B3CA	54.4	39.8	5.8		3	34.8	5.0	2.4	2.2	0.8	0.2	0.2	TR	--	--	3	--
80P2300	5S	99-114	C1	43.4	48.0	8.6			36.1	11.9	2.8	3.4	1.8	0.5	0.1	TR	--	--	6	--
80P2301	6S	130-145	C1	47.6	44.2	8.2			38.9	5.3	2.8	2.8	1.7	0.8	0.1	TR	TR	--	5	--
80P2302	7S	160-175	C2	40.2	51.9	7.9			43.2	8.7	3.6	2.9	1.0	0.4	TR	TR	--	--	4	--
80P2303	8S	191-206	C3	26.6	37.0	36.4			22.0	15.0	12.7	15.1	6.8	1.4	0.4	1	TR	--	24	1
80P2304	9S	221-236	C3	29.0	42.2	28.8			29.4	12.8	10.2	11.6	4.9	1.4	0.7	1	TR	--	19	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B1B	EXTR P 6S1A	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
80P2296	1	1.29	0.154						0.60	0.34			1.30				21.9			16.1	
80P2297	2	1.13	0.143						0.60	0.35			1.37	1.61	0.055		25.7	28.0	25.4	18.9	0.09
80P2298	3	0.63	0.077						0.53	0.34			1.47	1.64	0.040		18.1	24.2	21.9	12.8	0.13
80P2299	4	0.52							0.54	0.33			1.43	1.80	0.080		24.3		26.7	18.1	0.12
80P2300	5	0.41							0.51	0.41			1.36	1.48	0.029		24.4		26.7	18.0	0.12
80P2301	6	0.51							0.55	0.45			1.41	1.64	0.052		26.5		26.4	21.2	0.07
80P2302	7	0.48							0.59	0.43			1.39	1.62	0.052		24.5		29.2	17.4	0.16
80P2303	8	0.44							0.61	0.39			1.58	1.65	0.015		16.2		18.7	10.5	0.13
80P2304	9	0.40							0.63	0.48			1.54	1.65	0.023		19.6		20.7	13.8	0.11

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A 6N2E	MG 5B4A 6O2D	NA 5B4A 6P2B	K 5B4A 6Q2B	SUM BASES	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-OAC 5A6A	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C	<20MM 6F1C	PH SAT PASTE 8C1B	CACL2 .01M 8C1E 1:2	H2O 8C1A 1:1
		<- MEQ / 100 G ->								PCT		<- PCT ->		PCT		<- PCT ->				
80P2296	1	18.5	8.3	0.2	1.9	29.3	2.6	32.1	27.9			91	100	--					7.0	7.5
80P2297	2	23.4	9.9	0.1	1.6	35.2	2.9	38.1	31.9	TR	TR	92	100	TR	1500			7.1	7.2	7.6
80P2298	3		10.6	0.1	0.6				20.0	1	TR		100	12	2100			7.8	7.8	8.2
80P2299	4		23.0	0.7	0.7				29.3	2	2		100	10	1500			8.0	8.1	8.4
80P2300	5		19.7	1.3	0.6				22.0	3	2		100	5	470	15		7.8	7.9	7.9
80P2301	6		27.4	2.7	0.7				26.3	5	3		100	5	350	6		7.8	7.8	7.8
80P2302	7		24.3	3.0	0.7				23.8	7	4		100	6	410	2		7.7	7.8	7.6
80P2303	8		13.8	1.8	0.4				16.3	6	3		100	5	530	1		7.6	7.8	7.8
80P2304	9		15.2	1.9	0.4				18.2	6	3		100	5	470	2		7.6	7.7	7.7

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6N1B	MG 6O1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 6A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A1A MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2B	7A2B	7A2B	7A2B	DTA <2U 7A3	7A3	TOT ANL CLAY K2O 6Q3A	7C3 Fe 6C7A
		<- MEQ / LITER ->									<- PCT ->		/CM	<- RELATIVE AMOUNTS ->				<- PCT ->			
80P2296	1												0.23								
80P2297	2	3.3	2.2	0.6	0.3	--	4.3	1.1	0.6	--	61.7	TR	0.48	MT 3	MI 3	KK 2	QZ 1	KK15		3.2	4.8
80P2298	3	2.2	2.1	0.6	0.2	--	2.6	0.2	0.5	0.2	51.5	TR	0.43								
80P2299	4	1.1	2.4	2.0	0.2	--	3.1	0.1	1.1	0.1	79.9	TR	0.53	MT 5	MI 3	KK 3	CA 2	KK15		2.3	4.7
80P2300	5	24.8	35.1	9.7	0.5	--	1.7	0.7	65.0	1.1	63.5	0.2	4.49								
80P2301	6	23.3	51.6	19.4	0.7	--	1.6	1.5	91.5	1.8	70.5	0.3	5.83								
80P2302	7	23.0	44.4	20.5	0.6	--	1.5	1.6	84.1	--	65.8	0.3	5.60	MT 4	MI 3	KK 3	QZ 2	KK11		2.6	4.8
80P2303	8	22.1	31.8	17.7	0.6	--	1.5	0.8	68.7	0.9	46.7	0.2	4.82								
80P2304	9	23.7	27.8	17.6	0.6	--	1.4	0.8	66.0	0.9	50.9	0.2	4.72								

FAMILY CONTROL SECTION: DEPTH 13- 38 PCT CLAY 15 PCT .1-75MM 5

ESTIMATED BULK DENSITY FOR LAYER 1,

MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS 1,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE QZ QUARTZ CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Gerber[1/].

Pedon Number: S80MT-015-3

Classification: Fine, montmorillonitic, frigid Udorthentic Chromusterts.

Location: Chouteau County, Montana: 334 meters north and 2 meters west of the SE corner of Sec. 3, T.23N., R.8E.

Use and Vegetation: Cropland - presently in spring wheat.

Parent Material: Glacial till.

Region: Brown Glaciated Plain - MLRA 52.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: About 1 percent. SW aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-14-80

Ap - 0 to 13 cm.; very dark grayish brown (10YR3/2) clay, dark grayish brown (10YR4/2) dry; weak fine granular structure; slightly hard, friable; many fine roots; mildly alkaline; clear smooth boundary. (802296).

B21t - 13 to 31 cm.; very dark grayish brown (10YR3/2) clay, dark grayish brown (10YR4/2) dry; moderate medium blocky structure; very hard, firm; common fine roots slightly flattened between peds; common fine pores, few medium pores; thin almost continuous clay films on faces of peds; mildly alkaline; clear wavy boundary. (802297).

B22t - 31 to 56 cm.; dark grayish brown (10YR4/2) clay loam, grayish brown (10YR5/2) dry; weak fine and medium subangular blocky structure; hard, firm; common fine roots and pores; thin patchy clay films on faces of peds; few slickensides; carbonates are finely dispersed and not visible to the eye; violent effervescence, moderately alkaline; gradual wavy boundary. (802298).

B3ca - 56 to 97 cm.; dark grayish brown (2.5Y4/2) clay, grayish brown (2.5Y5/2) dry; massive; very hard, very firm; few fine roots and pores; about 10 percent by volume soft masses $CaCO_3$; few threads of gypsum; strong effervescence, moderately alkaline; clear wavy boundary. (802299).

C1 - 97 to 155 cm.; dark grayish brown (2.5Y4/2) silty clay, grayish brown (2.5Y5/2) dry; massive; very hard, very firm; few fine roots and very fine pores; about 15 percent by volume threads of gypsum; few soft masses of lignious material and iron hydroxides; strong effervescence, moderately alkaline; gradual wavy boundary. (802300, 301).

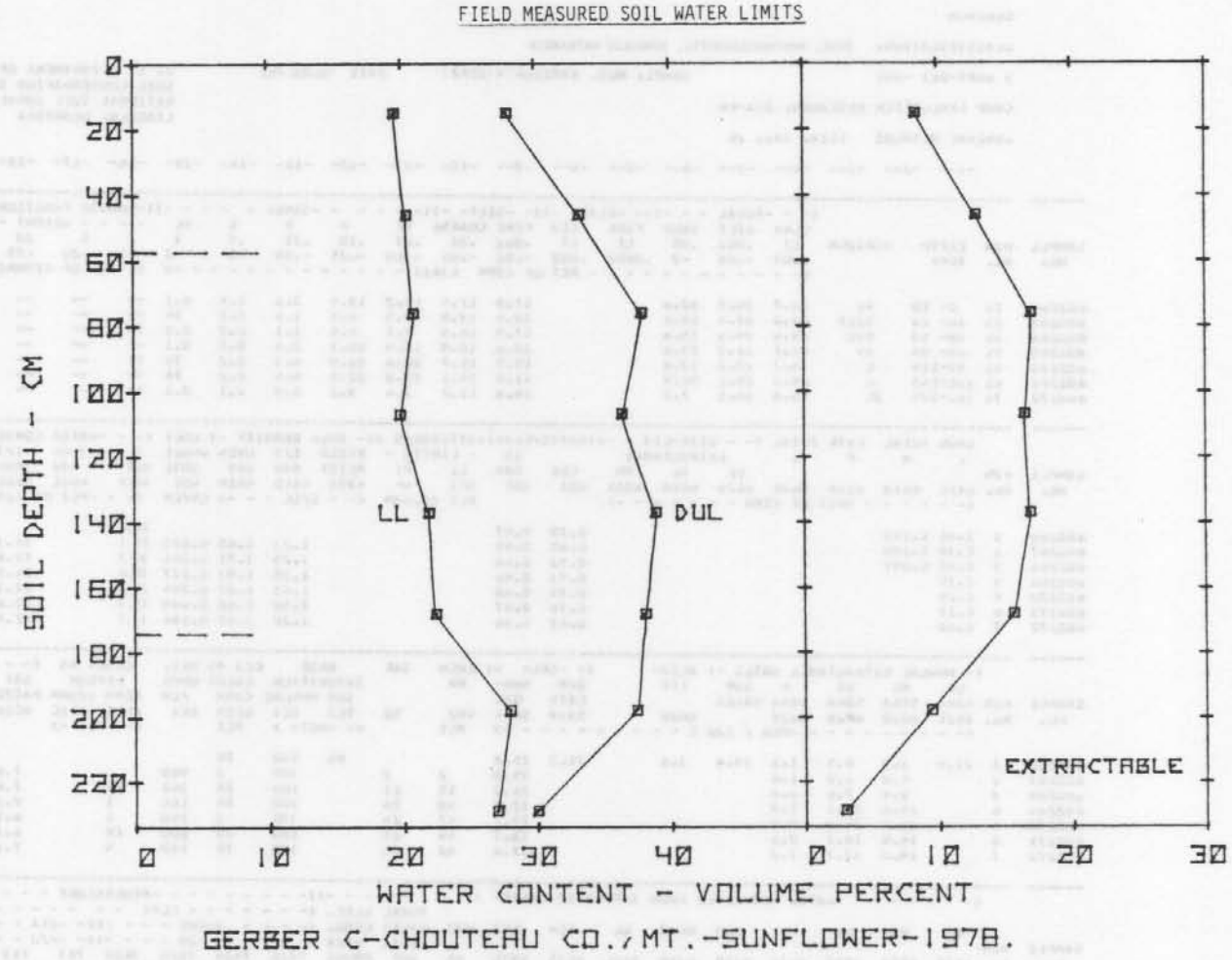
C2 - 155 to 183 cm.; grayish brown (2.5Y5/2) silty clay, light brownish gray (2.5Y6/2) dry; massive; hard, firm; few threads and films of gypsum; strong effervescence, mildly alkaline; gradual wavy boundary. (802302).

C3 - 183 to 244 cm.; light olive brown (2.5Y5/4) light clay loam, light yellowish brown (2.5Y6/4) dry; few medium faint olive yellow mottles; massive; hard, friable; weak effervescence, mildly alkaline. (802303, 304).

Remarks: Soil has a potential linear extensibility of slightly less than 6 cm. in the upper meter. When described the soil was cracked to the surface and appears to have a high shrink-swell potential.

Field Measured Soil Water Data Contributed By: P. L. Brown, USDA-AR, Plant and Soil Science Department, Montana State University.

Pedon Number: S80MT-015-3



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	19.5	27.9	8.4
46	20.4	33.3	12.9
76	20.9	37.9	17.0
107	19.9	36.4	16.5
137	22.0	38.9	16.9
168	22.5	38.1	15.6
198	28.0	37.4	9.4
229	27.0	30.0	3.0

TOTAL WATER EXTRACTED FROM PROFILE = 30.4 Cm.

GEROKUM

CLASSIFICATION: FINE, MONTMORILLONITIC, BOROLLIC NATRARGID

S 80PT-011 -001 SAMPLE NOS. 80P2266 - 2272 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AK

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05	TOTAL SAND 2	TOTAL FINE .0002	CLAY CC3 LT .002	SILT FINE .02	SILT COARSE .05	SILT VF .10	SAND F .25	SAND M .50	SAND C 1	SAND VC 2	COARSE FRACTIONS(MM) WEIGHT 5	20	75	>2MM .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
802266	1	0- 10	A1	32.7	39.5	32.8			17.0	17.5	15.2	13.5	3.6	0.4	0.1	--	--	--	18	--
802267	2	10- 23	B21T	44.0	37.4	18.6			23.5	13.9	10.5	6.4	1.6	0.1	TR	--	--	--	8	--
802268	3	38- 53	B22	44.6	34.8	15.6			17.9	16.9	9.7	4.5	1.1	0.2	0.1	TR	--	--	6	--
802269	4	69- 84	B3	44.7	31.7	23.6			20.8	10.9	10.9	10.1	2.4	0.1	0.1	--	--	--	13	--
802270	5	99-114	C	33.2	27.2	37.6			15.5	11.7	16.0	16.5	4.3	0.2	TR	TR	--	--	21	--
802271	6	130-145	C	24.0	25.1	50.9			11.0	14.1	23.8	22.5	4.4	0.2	TR	--	--	--	27	--
802272	7	160-175	2C	55.8	36.5	7.7			24.8	11.7	3.4	3.2	0.9	0.1	0.1	TR	--	--	4	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B1B	EXTR TOTAL P 6S1A	TOTAL FE 6A3A	DITH-CIT EXTRACTABLE AL 6C2B	MN 6D2A	CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4F	BULK DENSITY FIELD 1/3 BAR 4A3A	1/3 OVEN DRY 4A1D	OVEN -HOLE SOIL 4A1H	COLE 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->								PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
802266	1	1.41	0.149					0.79	0.47							20.4			15.5	
802267	2	0.38	0.106					0.80	0.49			1.23	1.65	0.103		26.1		34.3	19.9	0.18
802268	3	0.40	0.091					0.53	0.46			1.25	1.51	0.065		30.3		33.8	22.6	0.14
802269	4	0.35						0.73	0.46			1.35	1.93	0.127		30.6		34.5	20.6	0.19
802270	5	0.25						0.73	0.48			1.43	1.87	0.094		24.4		29.7	16.9	0.18
802271	6	0.17						0.78	0.47			1.50	1.68	0.039		18.3		20.8	11.2	0.14
802272	7	0.40						0.67	0.46			1.20	2.00	0.186		37.7		42.4	25.7	0.20

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A 6D2E	MG 5B4A 6D2D	NA 5B4A 6P2B	K 5B4A 6A2B	SUM BASES	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4- OAC 5A6A	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	NH4OAC 5C1	CC3 AS <2MM 6E1B	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C	<20MM 6F1C	SAT PASTE 8C1B	PH .01M CACL2 8C1E	H2O 8C1A
		<- - - - - - - - - -MEQ / 100 G - - - - - - - - - ->								PCT		<- -PCT- >		PCT		<- -PCT ->			1:2	1:1
802266	1	21.9	3.9	0.5	1.1	27.4	3.8	31.2	25.8			88	100	TR					6.5	7.0
802267	2		4.0	1.0	1.0				35.0	2	2		100	2	980			7.6	7.6	7.9
802268	3		8.9	7.6	0.8				26.3	15	11		100	TR	340	24		7.6	7.7	7.7
802269	4		24.6	29.1	1.0				32.6	40	24		100	TR	160	1		8.2	8.0	8.0
802270	5		21.0	24.8	0.6				25.7	47	24		100	2	140	2		8.1	8.3	8.1
802271	6		14.6	16.2	0.6				18.7	44	26		100	TR	200	TR		8.1	8.2	8.2
802272	7		24.0	32.7	1.2				37.4	42	23		100	TR	140	4		7.6	7.5	7.5

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6D1B	NA 6P1B	K 6A1D	CC3 6I1B	HC03 6J1B	CL 8A1C	SO4 8A1C	NO3 8N1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2B	7A2B	7A2B	7A2B	DTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 6Q3A	Fe 6C7A
		<- - - - - - - - - - -MEQ / LITER - - - - - - - - - ->									<- -PCT ->			<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
802266	1												0.18								
802267	2	5.3	0.6	3.0	0.2	--	4.7	0.2	2.6	--	72.2	TR	0.77	MI 5	MI 2	KK 2	QZ 2	KK 6		1.9	4.7
802268	3	23.7	9.8	43.6	0.3	--	6.5	6.3	77.4	--	82.5	0.4	5.74								
802269	4	26.9	49.3	190.9	0.5	--	1.5	1.2	222.4	--	113.2	1.2	13.08	MI 4	MI 3	KK 2	QZ 2	KK 4		2.0	4.4
802270	5	22.4	56.8	151.8	0.5	--	1.8	0.4	240.3	8.0	83.7	1.0	14.17								
802271	6	20.1	50.7	155.5	0.5	--	1.7	0.3	232.3	--	63.8	0.7	13.79								
802272	7	18.9	43.4	127.1	0.7	--	0.2	2.0	177.5	--	133.2	1.3	12.10								

MMHOS/CM OF 1:2 WATER EXTRACT (dI) FOR LAYERS 1,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Gerdrum[1/].

Pedon Number: S80MT-011-1

Classification: Fine, montmorillonitic Borollic Natrargids.

Location: Carter County, Montana: Legal description not available. Site sampled is 1 meter south of neutron tube 232 of Site 2, Watershed 23 of the Ekalaka Frail Land Study.

Use and Vegetation: Native rangeland - Western Wheatgrass and blue grama. About 10 percent infestation of prickly pear and sagebrush.

Parent Material: Old lake sediments.

Region: Pierre Shale Plains, Northern Part - MLRA 60B.

Position: Upland.

Elevation: ----------

Drainage Permeability: Well drained, very slowly permeable.

Water Table and Duration; None.

Slope: About 3 percent (convex) S aspect.

Sampled and Described By: Larry F. Ratliff Date 8-22-80

A1 - 0 to 10 cm.; dark brown (10YR3/3) clay loam, brown (10YR4/3) dry; weak fine granular structure; very hard, friable; many fine and medium roots; neutral; abrupt smooth boundary. (802266).

B21t - 10 to 23 cm.; very dark grayish brown (10YR3/2) clay, (10YR3.5/2) dry; moderate medium prismatic parting to moderate medium blocky structure; extremely hard, very firm; common fine roots flattened between peds; thick continuous clay films on faces of peds; few soft masses of soluble salts; moderately alkaline; abrupt smooth boundary. (802267).

B22t - 23 to 61 cm.; very dark gray (10YR3/1) clay, dark gray (10YR4/1) dry; strong medium prismatic structure; extremely hard, very firm; few very fine roots; thick continuous clay films on faces of prisms; few soft masses of $CaCO_3$; matrix color almost obscured by accumulation of white soluble salts; mildly alkaline; gradual wavy boundary. (802268).

B3 - 61 to 94 cm.; very dark grayish brown (10YR3/2) clay, dark grayish brown (10YR4/2) dry; weak medium prismatic structure; very hard, firm; few fine roots; thin patchy clay films on faces of prisms; 10 percent by volume soft masses of soluble salts; weak effervescence, moderately alkaline; gradual wavy boundary. (802269).

C - 94 to 160 cm.; dark grayish brown (10YR4/2) heavy sandy clay loam, grayish brown (10YR5/2) dry; massive; hard, friable; alternating strata of clayey and loamy materials, loamy strata increase with depth; few small masses of soluble salts; weak effervescence in places, moderately alkaline; clear wavy boundary. (802270, 271).

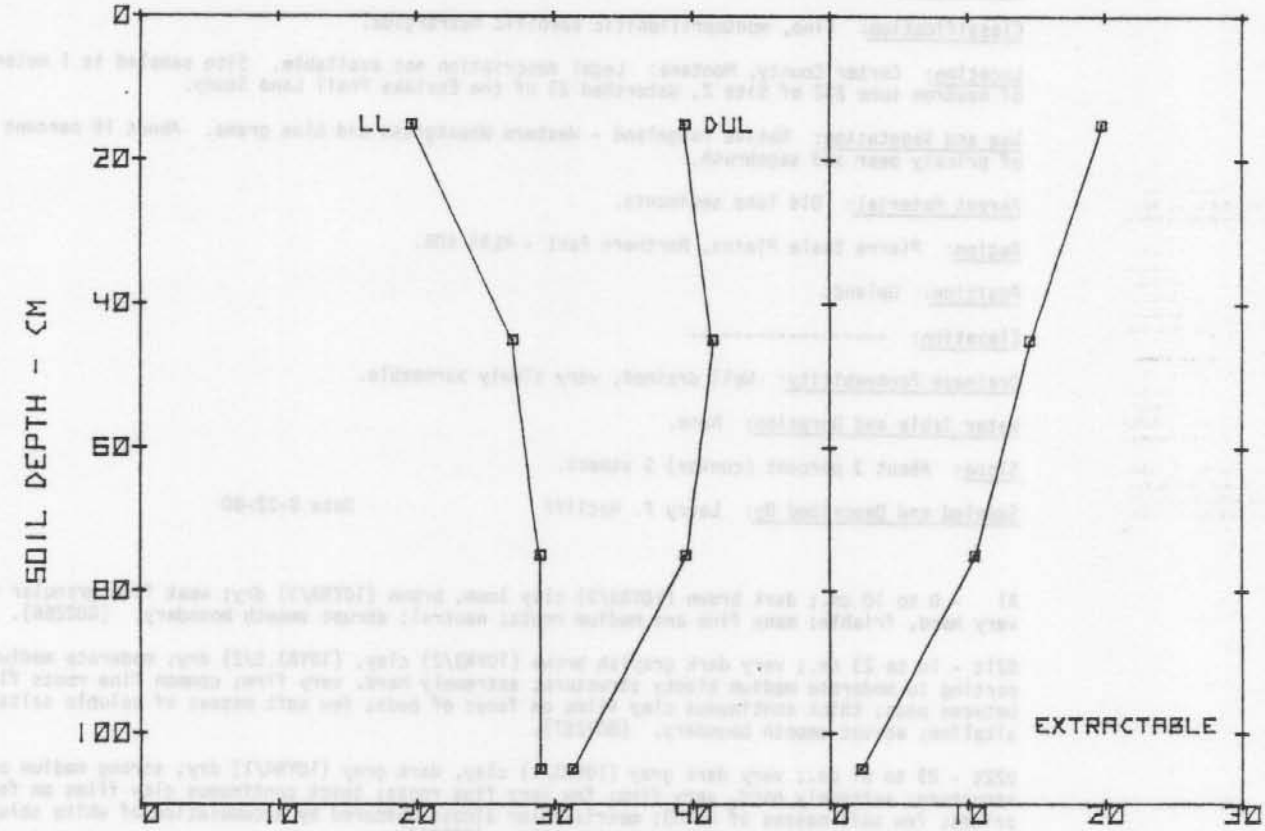
IIC - 160 to 183 cm.; very dark gray (10YR3/1) heavy clay, dark gray (10YR4/1) dry; massive; extremely hard, very firm; few seams and pockets of loamy material; few soft masses soluble salts; mildly alkaline. (802272).

Remarks: [1/]Soil differs from Gerdrum by having lower color values in the B horizons. Soil cracks to the surface - presently about 2.5 cm. wide. About 10 percent of the area is "slickspots" that range from 1 to several meters in diameter and are void of vegetation. Data from this pedon was not included in the analysis since it was the only soil appreciably affected by sodium.

Field Measured Soil Water Data Contributed By: E. L. Neff, USDA-AR, Northern Plains Soil and Water Research Center, Sidney, Montana.

Pedon Number: S80MT-011-1

FIELD MEASURED SOIL WATER LIMITS



GERDRUM CL-CARTER CO., MT.-RANGELAND-1975.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	19.7	39.5	19.8
45	27.0	41.5	14.5
75	29.0	39.5	10.5
105	29.0	31.3	2.3

TOTAL WATER EXTRACTED FROM PROFILE = 14.1 Cm.

GRENADA

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC GLOSSIC FRAGIUDALF

S 80KY-035 -001 SAMPLE NOS. 81P 761 - 766 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-	-18-	-19-	-20-
				(- - -TOTAL - - -)		(- -CLAY- -)		(- -SILT- -)		(- - - - - -SAND- - - - - -)						(-COARSE FRACTIONS(MM)-)(>2MM)				
				CLAY	SILT	SAND	FINE	CO3	FINE	COARSE	VF	F	M	C	VC	- - - - WEIGHT - - - -				WT
SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	LT .002	.002 -.05	-2	.0002	.002	-.002	-.05	-.10	-.25	-.50	-1	-2	-5	-20	-75	75	PCT OF WHOLE
				<- - - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				SOIL
81 761	1S	0- 23	AP	15.7	79.5	4.8			44.1	35.4	0.8	0.8	1.4	1.2	0.6	2	3	5	12	8
81 762	2S	23- 64	B21	21.3	74.8	3.9			44.1	30.8	0.7	0.9	1.3	0.9	0.1	1	3	2	9	6
81 763	3S	64- 81	B22	20.2	76.3	3.5			40.5	29.9	0.8	0.8	1.0	0.7	0.2	1	2	--	6	3
81 764	4S	81-107	B23	24.5	72.1	3.4			38.8	33.3	0.9	1.0	0.9	0.4	0.2	1	3	--	6	4
81 765	5S	107-140	B3	24.1	70.0	5.9			38.0	32.0	1.1	1.9	1.7	0.7	0.5	1	3	--	9	4
81 766	6S	140-163	B3	21.1	71.2	7.7			36.2	35.0	1.2	2.5	2.4	1.0	0.6	1	2	--	9	3

		ORGN	TOTAL	EXTR	TOTAL	(- - DITH-CIT - -)		(RATIO/CLAY)		(ATTERBERG LIMITS)		(- BULK DENSITY -)		COLE	(- - -WATER CONTENT - - -)				WRD
		C	N	P	S	EXTRACTABLE				15										WHOLE
SAMPLE NO.	HZN NO.	6A1C	6B3A		6H3A	FE 6G2B	AL 6G7A	MN 6G2A	CEC 8C1	BAR 8D1	LL 4F1	PI 4F	MOIST 4A3A	BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	BAR 4E2A	SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 761	1	1.16	0.108						0.64	0.48			1.43	1.48	0.011	13.2	25.4	22.6	7.6	0.20
81 762	2	0.24	0.042						0.46	0.44			1.46	1.51	0.011	16.2	26.1	24.3	9.4	0.21
81 763	3	0.13							0.54	0.43			1.40	1.49	0.021	17.7	30.1	27.5	11.3	0.22
81 764	4	0.11							0.57	0.43			1.50	1.57	0.015	16.8		22.9	10.5	0.18
81 765	5	0.08							0.53	0.45			1.75	1.62	--	16.2		25.5	10.8	1.46
81 766	6	0.07							0.45	0.44			1.56	1.63	0.014	14.1		21.5	9.3	0.19

		(- NH4OAC EXTRACTABLE BASES -)					ACID-	EXTR	(- - - -CEC - - -)			AL	-BASE	SAT-	CO3 AS	RES.		COND.	(- - - -PH - - -)	
		CA	MG	NA	K	SUM	ITY	AL	SUM	NH4-	BASES	SAT	SUM	NH4	CACO3	OHMS		MMHOS	CACL2	H2O
SAMPLE NO.	HZN NO.	5B3A 6A2E	5B5A 6A2G	5B9A 6P2E	5B5A 6A2B	BASES 0H3A	6G9A		CATS 5A3A	OAC 5A8B	+ AL 5A3B	5G1	5C3	CAC 5C1	<2MM 6E1G	/CM 8E1		/CM 8I	.01M 6C1F	8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->							1:2	1:1
81 761	1	5.6	0.5	--	0.6	10.7	3.3		14.0	10.0			76	100	1				6.5	6.9
81 762	2	4.2	0.7	0.1	0.2	5.2	7.6	2.2	12.8	9.8	7.4	30	41	53					4.2	4.7
81 763	3	2.4	2.2	0.2	0.2	5.0	11.2	5.6	16.2	14.2	10.6	53	31	35					4.0	4.4
81 764	4	1.7	2.7	0.2	0.2	4.8	10.4	5.8	15.7	13.9	10.6	55	31	35					3.9	4.4
81 765	5	1.3	3.0	0.4	0.2	4.9	8.9	4.9	13.8	12.8	9.8	50	36	38					3.8	4.6
81 766	6	1.3	2.6	0.4	0.1	4.4	6.6	2.7	13.0	9.5	7.1	38	34	46					4.0	4.9

		(- - - - - - - - -MINERALOGY - - - -)								TOT ANL 7C3
		(- - - - - - - - CLAY - - - - - - - -)								CLAY
		(- - - - X-RAY - - - -)(- -DTA - -)								
		(- - - - - <2U - - - -)(- -<2U - -)							K20	Fe
SAMPLE NO.	HZN NO.	7A2I	7A2I	7A2I	7A2I	7A3	7A3		603A	6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->				
81 761	1									
81 762	2	VR 3	KK 3	MI 2	GE 1	KK20			1.3	6.8
81 763	3	VR 3	KK 3	MI 3	MI 2	KK23			1.4	7.0
81 764	4									
81 765	5	VR 3	KK 3	MI 3	MI 2	KK24			1.2	7.3
81 766	6									

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL VR VERMICULITE KK KAOLINITE MI MICA GE GOETHITE MT MONTMORILL

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Grenada.

Pedon Number: S80KY-035-1

Classification: Fine-silty, mixed, thermic Glossic Fragiudalfs.

Location: Calloway County, Kentucky: 1.5 miles south on State Highway 893 from its intersection with State Highway 121 in Cherry, then 1.65 miles west on paved county and 12 meters south in cultivated field.

Use and Vegetation: Cropland - no-till soybeans for the past three years.

Parent Material: Loess over coastal plain sediments.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Gently rolling upland.

Elevation: ----------

Drainage and Permeability: Moderately well-drained, moderately permeable to 64 cm., slowly permeable below.

Water Table and Duration: Perched at about 64 cm. during December through March.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff and Grant Thomas Date: 11-19-80

Ap -- 0 to 23 cm.; dark yellowish brown (10YR3/4) heavy silt loam; weak medium platy parting to moderate fine subangular blocky structure; hard, friable; common fine and medium roots; few fine pores; few fine Fe-Mn concretions; neutral; clear smooth boundary. (810761).

B21 -- 23 to 64 cm.; yellowish brown (10YR5/6) silt loam; weak fine and medium subangular blocky structure; very hard, friable; few fine and medium roots; common fine and medium pores; thin patchy clay films on vertical faces of peds; few fine Fe-Mn concretions; very strongly acid; clear wavy boundary. (810762).

Bx1 -- 64 to 81 cm.; light brownish gray (10YR6/2) light gray (10YR7/2) 60 percent, dark yellowish brown (10YR4/4) 40 percent, silt loam; weak coarse platy structure; very hard, firm; few fine roots in gray parts; few medium pores in brown part; light gray parts appear to be silt coatings; brown parts are brittle; extremely acid; clear wavy boundary. (810763).

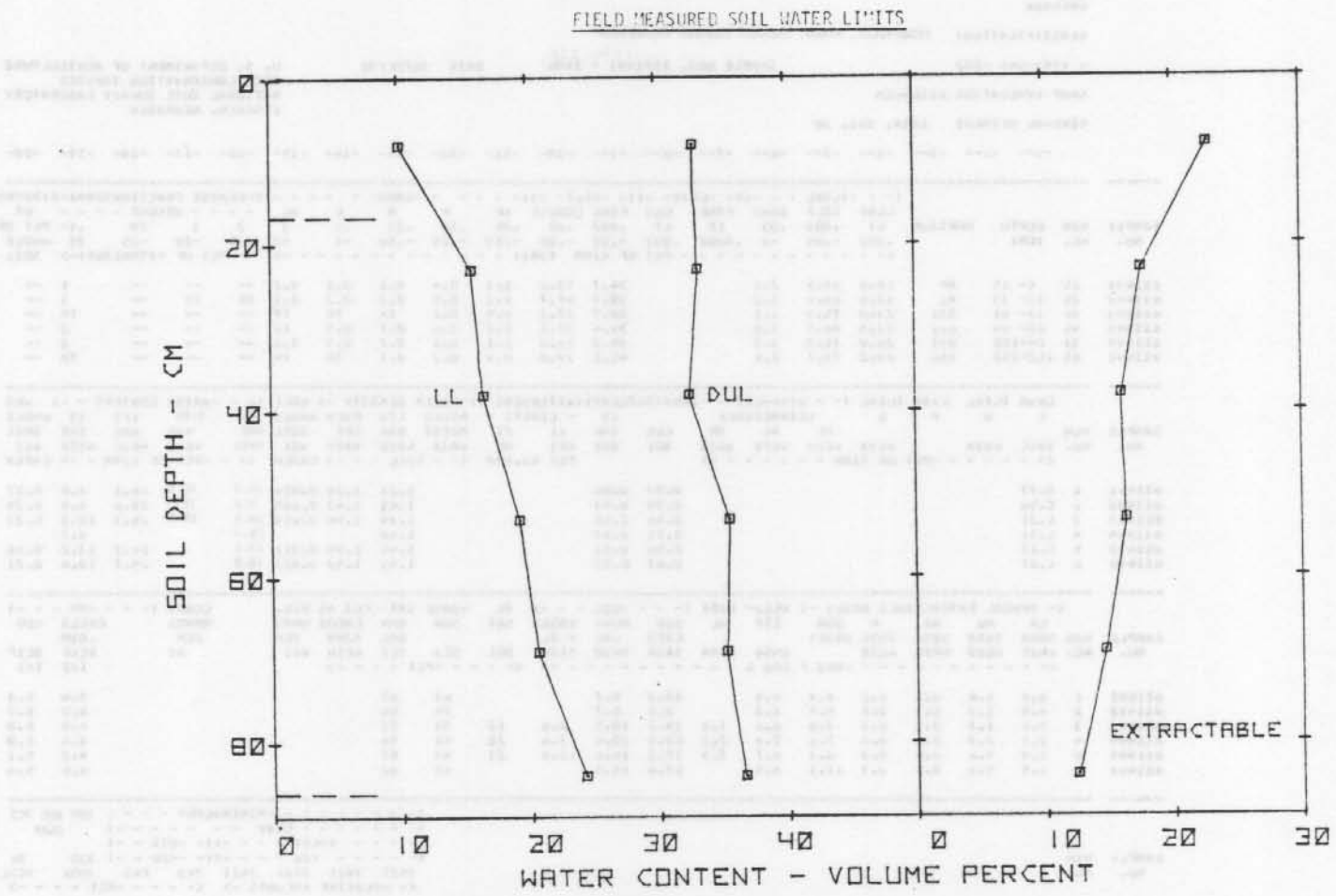
Bx2 -- 81 to 107 cm.; mottled yellowish brown (10YR5/6) dark yellowish brown (10YR4/6) and light brownish gray (10YR6/2) silt loam; weak coarse platy structure; very hard, firm; few fine roots in gray seams; few medium pores in brown part; brown parts make up about 60 percent of the matrix and are brittle; extremely acid; gradual wavy boundary. (810764).

Bx3 -- 107 to 183 cm.; mottled yellowish brown (10YR5/6) dark yellowish brown (10YR4/6) light brownish gray (10YR6/2) and light gray (10YR7/2) silt loam; weak coarse platy structure; very hard, firm; few medium pores in brown parts; brown parts make up about 50 percent of the matrix and are brittle; very strongly acid. (810765, 766).

Remarks: Colors are for moist soil. Surface layer is slightly darker than allowed for Grenada series. "Glossic" features and the very coarse prismatic structure typical of these soils was not observed from auger samples.

Field Measured Soil Water Data Contributed By: G. W. Thomas and R. E. Phillips, Department of Agronomy, University of Kentucky.

Pedon Number: S80KY-035-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
0	10.1	32.9	22.8
23	15.6	33.2	17.6
38	16.5	32.5	16.0
53	19.2	35.5	16.3
69	20.6	35.2	14.6
84	24.2	36.6	12.4

TOTAL WATER EXTRACTED FROM PROFILE = 15.2 Cm.

GRENADA

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC GLOSSIC FRAGIUDALF

S 81MS-049 -002 SAMPLE NOS. 81P1491 - 1496 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05 LT .002	TOTAL SAND -2 .05	CLAY FINE LT .002	SILT CO3 LT .002	SILT FINE .02 .002	SILT COARSE .05 .02	SAND VF .10 .05	SAND F .25 .10	SAND M .50 .25	SAND C 1 .5	SAND VC 2 1	COARSE FRAGS (MM) WEIGHT 5 2	COARSE FRAGS (MM) WEIGHT 20 5	COARSE FRAGS (MM) WEIGHT 75 .1-	COARSE FRAGS (MM) WEIGHT PCT OF WHOLE SOIL	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM (3B1) ->				
81P1491	1S	0- 15	AP	10.0	87.9	2.1			34.7	53.2	1.3	0.4	0.1	0.1	0.2	--	--	--	1	--
81P1492	2S	15- 33	A2	11.4	86.4	2.2			38.7	47.7	1.2	0.5	0.2	0.2	0.1	TR	TR	--	1	--
81P1493	3S	33- 61	B21	23.0	75.9	1.1			38.7	37.2	0.9	0.2	TR	TR	TR	--	--	--	TR	--
81P1494	4S	61- 89	B22	20.5	76.5	3.0			39.4	37.1	1.2	0.6	0.7	0.5	TR	--	--	--	2	--
81P1495	5S	89-102	B3	20.0	77.0	3.0			35.0	36.0	1.1	0.6	0.7	0.5	0.1	--	--	--	2	--
81P1496	6S	102-152	B3	20.2	78.7	1.1			41.1	37.6	0.8	0.2	0.1	TR	TR	--	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	TOTAL S 6R3A	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	RATIO/CLAY CEC 15 8D1	RATIO/CLAY BAR 15 8D1	ATTERBERG LL 4F1	ATTERBERG PI 4F	BULK DENSITY FIELD MOIST 1/3 BAR 4A3A	BULK DENSITY 1/3 BAR OVEN DRY 4A1C	COLE WHOLE SOIL 4A1H	WATER CONTENT 2- 0.06 BAR 4B1A	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B1C	WATER CONTENT WHOLE SOIL 4B2A	WRD 4C1
		<- - - - - - PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->		CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81P1491	1	1.77							0.97	0.80				1.21	1.26	0.014	10.7	36.0	28.1	6.0	0.27
81P1492	2	0.56							0.59	0.43				1.41	1.43	0.005	9.2	31.3	25.6	4.9	0.29
81P1493	3	0.21							0.46	0.45				1.38	1.46	0.019	16.5	29.6	25.3	10.3	0.21
81P1494	4	0.11							0.51	0.47				1.40			16.7			9.7	
81P1495	5	0.11							0.56	0.51				1.44	1.49	0.011	19.1		24.2	13.2	0.16
81P1496	6	0.07							0.67	0.53				1.42	1.52	0.023	18.8		25.7	10.8	0.21

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES LA 5B5A 6A2E	MG 5B5A 6B2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES 6H5A	ACID- ITY 6G9A	EXTR AL	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	CO3 AS NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->										<- - - - PCT - - - ->							
81P1491	1	6.5	1.6	0.1	0.2	8.4	4.9		13.3	9.7			63	87					5.4	5.8
81P1492	2	4.9	1.3	0.1	0.1	6.4	2.2		8.6	6.7			74	96					6.0	6.7
81P1493	3	4.4	2.7	0.3	0.2	7.6	6.6	1.0	14.2	10.5	8.6	12	54	72					4.5	5.0
81P1494	4	2.1	2.7	0.5	0.3	5.6	7.9	2.2	13.5	10.4	7.8	28	41	54					4.4	5.0
81P1495	5	2.9	4.6	0.5	0.3	8.3	8.7	2.5	17.0	14.6	10.8	23	49	57					4.2	5.1
81P1496	6	4.5	5.8	0.5	0.3	11.1	6.5		17.6	13.5			63	82					4.6	5.6

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 6C7A	TOT ANL 7C3 CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81P1491	1								
81P1492	2								
81P1493	3					MT 3	KK 3 MI 2 VR 1 KK23	1.6	8.3
81P1494	4								
81P1495	5								
81P1496	6								

FAMILY CONTROL SECTION: DEPTH 33- 89 PCT CLAY 22 PCT .1-75MM 1

ESTIMATED BULK DENSITY FOR LAYER 4,

ANALYSES: S# ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL KK KAOLINITE MI MICA VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Grenada.

Pedon Number: S81MS-049-2

Classification: Fine-silty, mixed, thermic Glossic Fragiudalfs.

Location: Hinds County, Mississippi: SW 1/4 of the NW 1/4, Sec. 34, T.5N., R.3W. Treatment 2 - Rep. 3 of F. Whisler's 1980 Tillage Plots at the Brown Loam Experiment Station near Raymond.

Use and Vegetation: Cropland - presently in winter wheat with a soybean rotation.

Parent Material: Loess.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Upland.

Elevation: About 65 meters.

Drainage and Permeability: Moderately well drained, moderately permeable above the fragipan and slowly permeable in the fragipan.

Water Table and Duration: Perched above the pan during wet seasons.

Slope: About 0.5 percent. Slightly concave.

Sampled and Described By: Larry F. Ratliff Date: 2-24-81

Ap -- 0 to 15 cm.; brown (10YR4/3) silt; massive; hard, friable; many fine and medium roots; few pockets of partially decomposed organic matter; medium acid; clear smooth boundary. (811491).

A12 -- 15 to 33 cm.; brown (10YR4/3) silt; weak fine and medium subangular blocky structure; very hard, friable; common fine roots; few medium roots; common dark brown stains on faces of peds; neutral; clear smooth boundary. (811492).

B21 -- 33 to 61 cm.; yellowish brown (10YR5/4) silt loam; weak fine and medium subangular blocky structure; very hard, friable; common fine roots; few fine pores; few fine distinct yellowish red (5YR5/6) mottles; thin patchy clay films on vertical faces of peds; very strongly acid; clear wavy boundary. (811493).

B22 & A'2 -- 61 to 69 cm.; yellowish brown (10YR5/4) silt loam; weak fine and medium subangular blocky structure; very hard, friable; common fine and medium roots; few fine pores; A'2 material makes up about 20 percent of the horizon is pale brown (10YR6/3) and light gray (10YR7/2); few fine soft masses of Fe-Mn; very stongly acid; clear wavy boundary. (811494).

Bx1 -- 69 to 102 cm.; mottled light brownish gray (10YR6/2) and yellowish brown (10YR5/8) silt loam; brown parts are brittle and compact in place, gray parts slightly more silty than brown parts; weak medium platy parting to weak medium subangular blocky structure; few fine roots; common fine and medium pores; few soft masses of Fe-Mn; extremely hard, firm; strongly acid; clear wavy boundary. (811495).

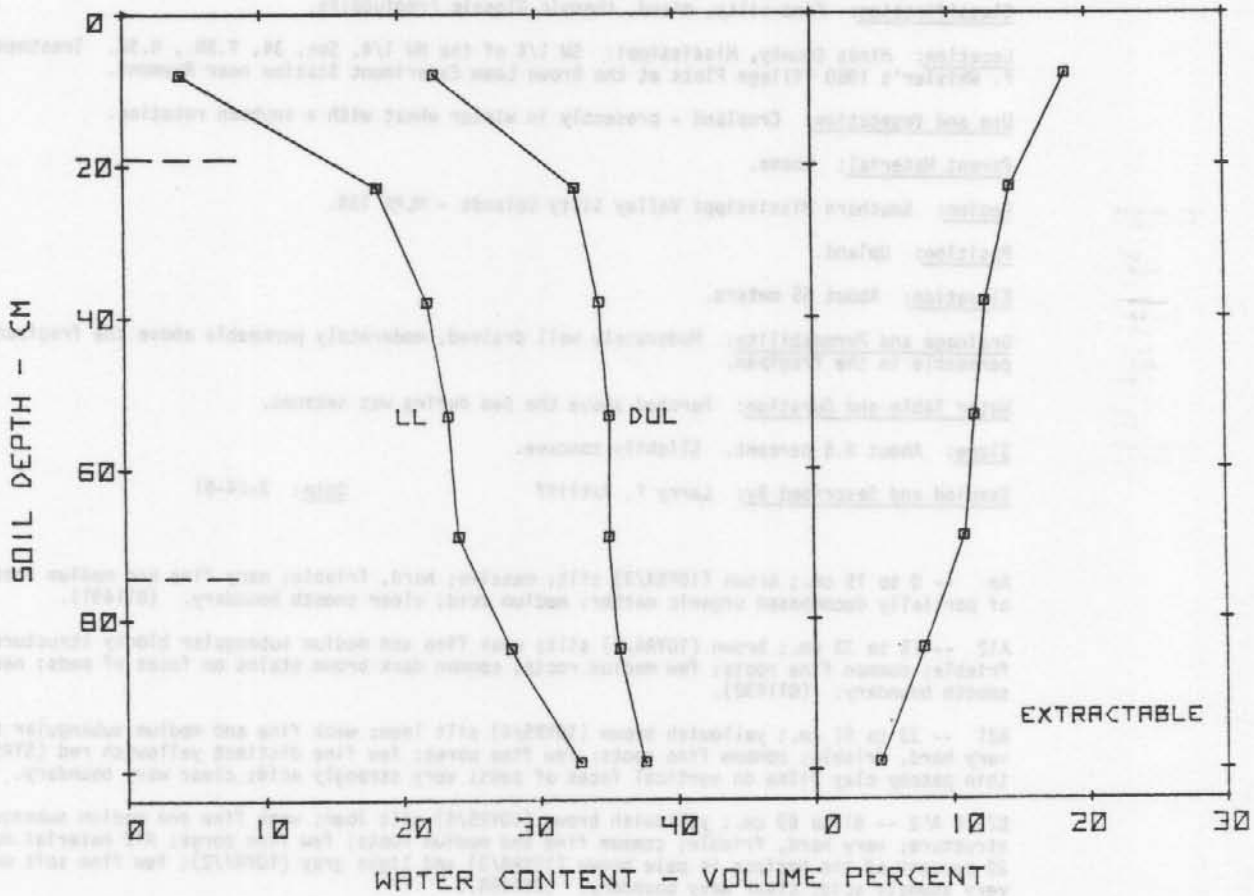
Bx2 -- 102 to 152 cm.; mottled brown (10YR4/3) and pale brown (10YR6/3) silt loam; estimated 10 percent light gray (10YR7/2) silt seams; brown parts are compact and slightly brittle in place; weak fine subangular blocky structure; extremely hard, firm; common fine and medium pores; medium acid. (811496).

Remarks: Colors are for moist soil.

Field Measured Soil Water Data Contributed By: F. D. Whisler, Department of Agronomy and Soils, Mississippi State University.

Pedon Number: S81MS-049-2

FIELD MEASURED SOIL WATER LIMITS



GRENADA SI-HINDS CO./MS.-SOYBEANS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	4.1	22.6	18.5
23	18.4	32.8	14.4
38	22.0	34.5	12.5
53	23.5	35.2	11.7
69	24.2	35.1	10.9
84	27.9	35.8	7.9
99	32.9	37.6	4.7

TOTAL WATER EXTRACTED FROM PROFILE = 12.3 Cm.

GRENADA

CLASSIFICATION:

S 81TN-157 -G02

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NOS. 81P1518 - 1522 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

-1- -2- -3- -4- -5- -6- -7- -8- -9- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .0002	CO3 CLAY LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	5 -20	20 -75	.1- 75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1) ->				
811518	1S	0- 20	AP	13.1	84.8	2.1			32.3	52.5	1.5	0.3	0.2	0.1	TR	TR	--	--	1	--
811519	2S	20- 46	B2	23.9	73.9	2.2			37.5	36.4	1.3	0.6	TR	0.3	TR	--	--	--	1	--
811520	3S	46- 74	B22	20.1	75.1	4.8			38.6	36.5	1.6	0.6	0.9	1.4	0.3	--	--	--	3	--
811521	4S	74-124	BX1	22.7	74.7	2.6			40.4	34.3	1.2	0.5	0.5	0.3	0.1	--	--	--	1	--
811522	5S	124-198	BX2	20.2	78.3	1.5			38.3	40.0	1.0	0.3	0.1	0.1	--	--	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B3A	EXTR TOTAL P	EXTR TOTAL S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CITR-CIT CEC 8D1	CITR-CIT 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B2A	WATER CONTENT 15 BAR 4C1	WRD WHOLE SOIL CM/CM
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
811518	1	0.10							0.53	0.44				1.51	1.56	0.011	10.3	25.9	21.5	5.7	0.24
811519	2	0.25							0.50	0.44				1.45	1.53	0.018	17.2	28.6	25.3	10.6	0.21
811520	3	0.12							0.64	0.49				1.42	1.51	0.021	16.6	29.5	26.4	9.9	0.23
811521	4	0.09							0.71	0.52				1.53	1.62	0.019	17.8		21.6	11.7	0.15
811522	5	0.07							0.81	0.54				1.46	1.52	0.014	17.4		24.4	11.0	0.20

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A 6N2E	MG 5B5A 6U2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- MEQ / 100 G ->											<- PCT ->					1:2	1:1
811518	1	3.8	0.8	0.1	0.4	5.1	3.8	0.2	8.9	6.9	5.3	4	57	74				4.8	5.4
811519	2	5.1	2.5	0.1	0.2	7.9	7.6	1.1	15.5	12.0	9.0	12	51	66				4.5	4.8
811520	3	2.1	2.6	0.3	0.2	5.2	10.1	3.9	15.3	12.8	9.1	43	34	41				4.0	4.5
811521	4	3.2	4.6	0.7	0.3	8.8	10.4	3.4	19.2	16.1	12.2	28	46	55				4.0	4.5
811522	5	5.3	6.0	0.5	0.3	12.1	7.8	1.3	19.9	16.3	13.4	10	61	74				4.3	5.0

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	OTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
811518	1	MT 3	KK 3	MI 2	QZ 1	KK30		1.6	8.2
811519	2								
811520	3								
811521	4								
811522	5								

FAMILY CONTROL SECTION: DEPTH 20- 46 PCT CLAY 24 PCT .1-75MM 1

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL KK KAOLINITE MI MICA QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Grenada.

Pedon Number: S81TN-157-2

Classification: Fine-silty, mixed, thermic Glossic Fragiudalfs.

Location: Shelby County, Tennessee: One mile southeast from the community of Bolton on Pleasant Ridge Road and 142 meters north in cultivated field.

Use and Vegetation: Cropland - presently in cotton.

Parent Material: Loess.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Moderately well drained; moderately permeable above the fragipan, slowly permeable below.

Water Table and Duration: Perched at about 73 cm. during winter and early spring.

Slope: About 1 percent.

Sampled and Described By: Bill Brown and Larry F. Ratliff Date: 2-27-81

Ap - 0 to 20 cm.; brown (10YR4/3) silt loam; weak medium granular structure in upper 13 cm.; moderate thick platy structure below; hard, friable; common fine and medium roots; strongly acid; abrupt smooth boundary. (811518).

B21 - 20 to 46 cm.; yellowish brown (10YR5/6) silt loam; weak to moderate medium subangular blocky structure; very hard, friable; few medium roots; few fine and very fine pores; few horizontal tube-shaped pockets of brown silt loam about 6 mm. in diameter; very strongly acid; clear smooth boundary. (811519).

B22 - 46 to 61 cm.; yellowish brown (10YR5/6,5/4) silt loam; common medium distinct light brownish gray (10YR6/2) mottles; weak, medium subangular blocky structure; very hard, friable; common fine roots; few medium dark concretions; very strongly acid; clear wavy boundary.

- 61 to 73 cm.; light brownish gray (10YR6/2) silt loam; common medium distinct yellowish brown (10YR5/4,5/6) mottles; weak medium and coarse granular structure; very hard, friable; common fine and medium roots; common medium pores; common medium dark concretions; about 20 percent of horizon is prisms of dark yellowish brown (10YR3/4) silt loam; many medium, light brownish gray (10YR6/2) and yellowish brown (10YR5/4) mottles; very hard, firm and slightly brittle; very strongly aicd; clear irregular boundary. (811520).

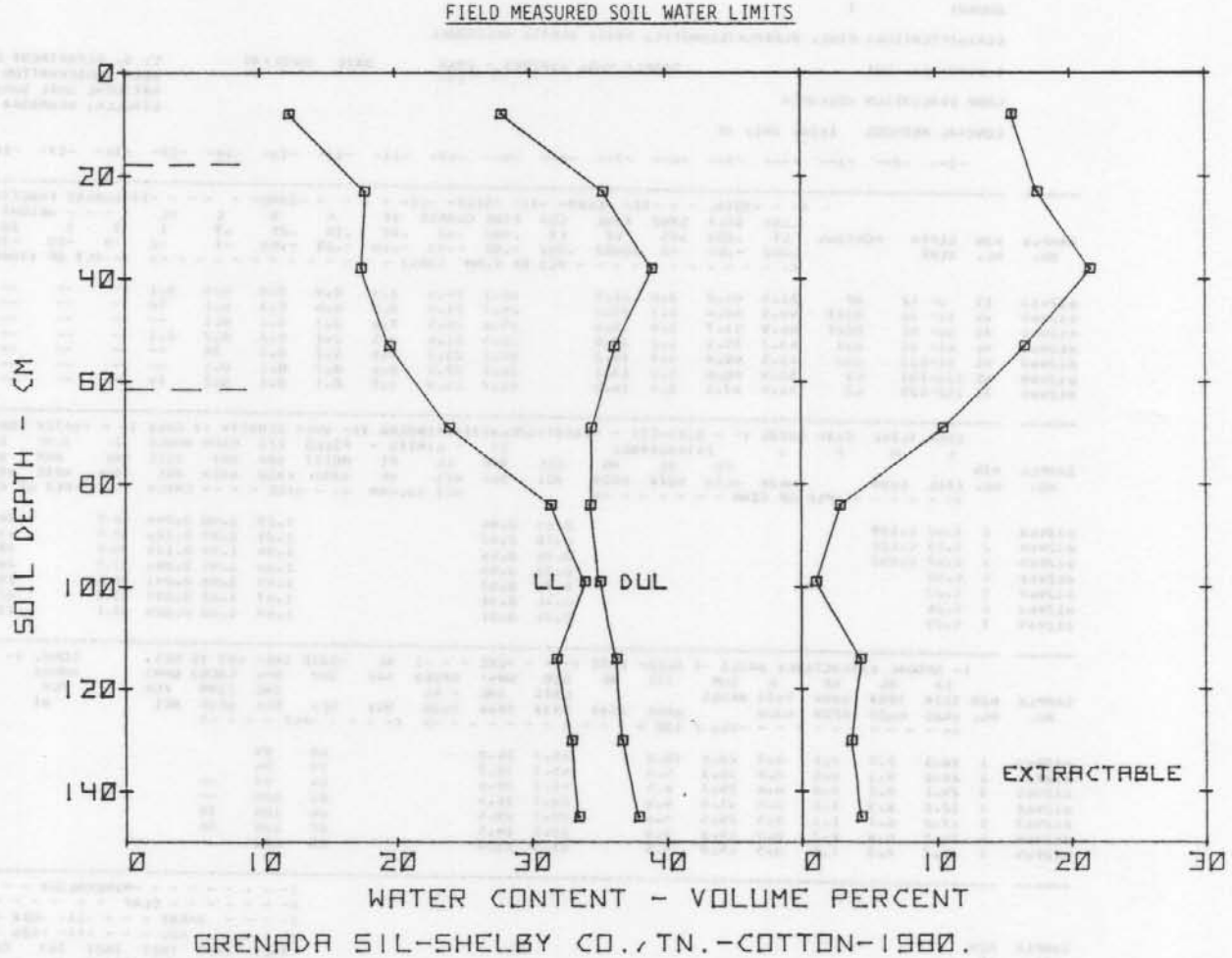
IIBX1 - 73 to 125 cm.; dark yellowish brown (10YR3/4) silt loam; many medium and coarse distinct yellowish brown (10YR5/4) and light brownish gray (10YR6/2) mottles; moderate coarse prismatic structure; firm, brittle; common fine and medium pores; few medium black concretions; about 20 percent by volume of tongues of light brownish gray (10YR6/2) silt loam that are .5 to 6 cm. wide; friable; common fine and medium roots in upper part of tongues; common fine and medium pores; very strongly acid; gradual smooth boundary. (811521).

IIBX2 - 125 to 205 cm.; dark yellowish brown (10YR3/4) silt loam; many medium distinct light brownish gray (10YR6/2) and common medium faint yellowish brown (10YR5/4) mottles; moderate coarse prismatic structure; very firm, slightly brittle; few fine and medium pores; few medium dark concretions; about 10 percent by volume of tongues of light brownish gray (10YR6/2) silt loam that are 0.5 to 6 cm. wide; common fine and medium pores; common medium dark concretions; very strongly acid. (811522).

Remarks: Colors are for moist soil.

Field Measured Soil Water Data Contributed By: Don D. Tyler, West Tennessee Experiment Station, Jackson, Tennessee.

Pedon Number: S81TN-157-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	12.2	27.9	15.7
23	17.8	35.4	17.6
38	17.5	39.0	21.5
53	19.6	36.2	16.6
69	24.0	34.5	10.5
84	31.5	34.4	2.9
99	34.0	35.1	1.1
114	31.9	36.3	4.4
130	33.0	36.7	3.7
145	33.5	37.9	4.4

TOTAL WATER EXTRACTED FROM PROFILE = 15.0 Cm.

GRUNDY I

CLASSIFICATION: FINE, MONTMORILLONITIC, MESIC VERTIC ARGIUDOLL

S 81NS-013 -001 SAMPLE NOS. 81P2963 - 2969 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05	TOTAL SAND 2	TOTAL FINE LT .0002	CLAY CO3 FINE LT .002	SILT COARSE .02	SILT FINE .05	SAND VF .10	SAND F .25	SAND M .50	SAND C 1	SAND VC 2	COARSE FRACTIONS(MM) WEIGHT 5	20	.1- 75	>2MM PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->			
812963	1S	0- 12	AP	31.4	65.0	3.6	21.5	30.1	34.9	1.4	0.9	0.8	0.4	0.1	--	--	--	2	--
812964	2S	12- 38	B21T	49.5	48.6	1.9	37.3	26.7	21.9	0.9	0.6	0.3	0.1	TR	--	--	--	1	--
812965	3S	38- 61	B22T	46.9	51.7	1.4	33.0	30.8	20.9	0.8	0.3	0.2	0.1	--	--	--	--	1	--
812966	4S	61- 81	B31	43.7	55.1	1.2	27.0	32.5	22.6	0.5	0.2	0.2	0.2	0.1	--	--	--	1	--
812967	5S	81-122	B32	33.3	65.8	0.9	15.2	40.1	25.7	0.6	0.2	0.1	TR	--	--	--	--	TR	--
812968	6S	122-152	C1	32.4	66.6	1.0	13.1	38.7	27.9	0.6	0.2	0.1	0.1	--	--	--	--	TR	--
812969	7S	152-185	C2	31.0	67.5	0.9	16.0	41.7	25.8	0.5	0.1	0.1	0.2	TR	--	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S	EXTRACTABLE FE 6C2D	AL 6G7A	MN 6D2A	CEC 8D1	15 BAR 8D1	LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
812963	1	1.02	0.139						0.85	0.44			1.23	1.40	0.044	20.0			26.1	13.7	0.15
812964	2	1.13	0.122						0.78	0.47			1.29	1.85	0.126	30.9			33.7	23.4	0.13
812965	3	0.87	0.092						0.76	0.46			1.34	1.95	0.135	30.6			31.2	22.7	0.11
812966	4	0.50							0.72	0.45			1.48	1.93	0.093	27.7			26.5	19.5	0.10
812967	5	0.27							0.76	0.52			1.49	1.68	0.041	26.1			25.6	17.3	0.12
812968	6	0.26							0.76	0.51			1.47	1.62	0.033	25.9			27.1	16.6	0.15
812969	7	0.29							0.76	0.51			1.47	1.60	0.029	26.1			27.3	16.2	0.16

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A6B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- MEQ / 100 G ->											<- PCT ->						
812963	1	18.3	5.0	0.1	0.5	23.9	10.8		34.7	26.8			69	89				5.5	5.8
812964	2	26.0	9.2	0.5	0.6	36.3	9.4		45.7	38.7			79	94				5.9	6.4
812965	3	24.1	9.2	0.8	0.6	34.7	6.5		41.2	35.6			84	97	--			6.4	7.0
812966	4	22.0	8.3	1.0	0.6	31.9	6.6		38.7	31.3			82	100	--			6.7	7.5
812967	5	17.0	6.7	1.3	0.5	25.5	4.6		29.5	25.4			86	100	TR			7.0	7.8
812968	6	18.3	6.4	1.7	0.5	26.9	3.8		28.7	24.5			87	100	TR			7.4	7.9
812969	7	15.7	6.0	1.8	0.5	24.0	4.3		28.3	23.9			85	100	--			7.4	7.8

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	7A3	7A3	DTA <2U 6D3A	TOT ANL 2C1 CLAY K2O	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- PCT ->		
812963	1	MT 5	MI 3	KK 2	QZ 1	KK11			1.5	5.3
812964	2									
812965	3	MT 5	MI 3	KK 2	QZ 1	KK16			1.8	5.6
812966	4									
812967	5	MT 5	MI 3	KK 2	QZ 1	KK10			1.9	4.6
812968	6									
812969	7									

FAMILY CONTROL SECTION: DEPTH 13- 61 PCT CLAY 48 PCT .1-75MM 1

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Grundy taxadjunct[1/].

Pedon Number: S81KS-013-1

Classification: Fine, montmorillonitic, mesic Vertic Argiudolls.

Location: Brown County, Kansas: 780 meters south and 480 meters west of the NE corner of Sec. 17, T.3S, R.16E. Soil described and sampled in the "field capacity plot" field F3 of Mark Claassen's Nitrogen Balance Study at the Powhattan Cornbelt Experiment Field.

Use and Vegetation: Cropland - presently fallow - previously in corn.

Parent Material: Loess.

Region: Nebraska and Kansas Loess - Drift Hills - MLRA 106.

Position: Upland.

Elevation: About 315 meters.

Drainage and Permeability: Moderately well drained and very slowly permeable.

Water Table and Duration: None observed.

Slope: About 1.5 percent. East facing.

Sampled and Described By: Larry F. Ratliff Date: 7-6-81

Ap - 0 to 12 cm.; very dark gray (10YR3/1) silty clay loam; weak fine and medium subangular blocky structure; hard, friable; few small pockets of partially decomposed organic residues; medium acid; abrupt smooth boundary. (812963).

B21t - 12 to 38 cm.; very dark gray (10YR3/1) silty clay; moderate fine and medium angular blocky structure; extremely hard, firm; few very fine pores; thin patchy clay films on faces of peds; many pressure faces on peds; slightly acid; gradual wavy boundary. (812964).

B22t - 38 to 61 cm.; dark gray (10YR4/1) silty clay; few fine faint yellowish brown mottles; weak fine angular blocky structure; extremely hard, very firm; thin patchy clay films on faces of peds; many pressure faces and few small slickensides; common vertical cracks filled with material from overlying horizons; neutral; gradual wavy boundary. (812965).

B31 - 61 to 81 cm.; dark grayish brown (2.5YR4/2) silty clay; few fine faint yellowish brown mottles; few fine faint light olive gray mottles; weak fine angular blocky structure; extremely hard, very firm; few slickensides up to 2 cm. wide; few vertical cracks filled with (10YR3/1) material; mildly alkaline; clear wavy boundary. (812966).

B32 - 81 to 122 cm.; gray (10YR5/1) silty clay loam; many medium and coarse, prominant yellowish brown (10YR5/8) and strong brown (7.5YR4/6) mottles; weak coarse subangular blocky structure; very hard, firm; common fine and medium pores, few coarse pores; mildly alkaline; gradual smooth boundary. (812967).

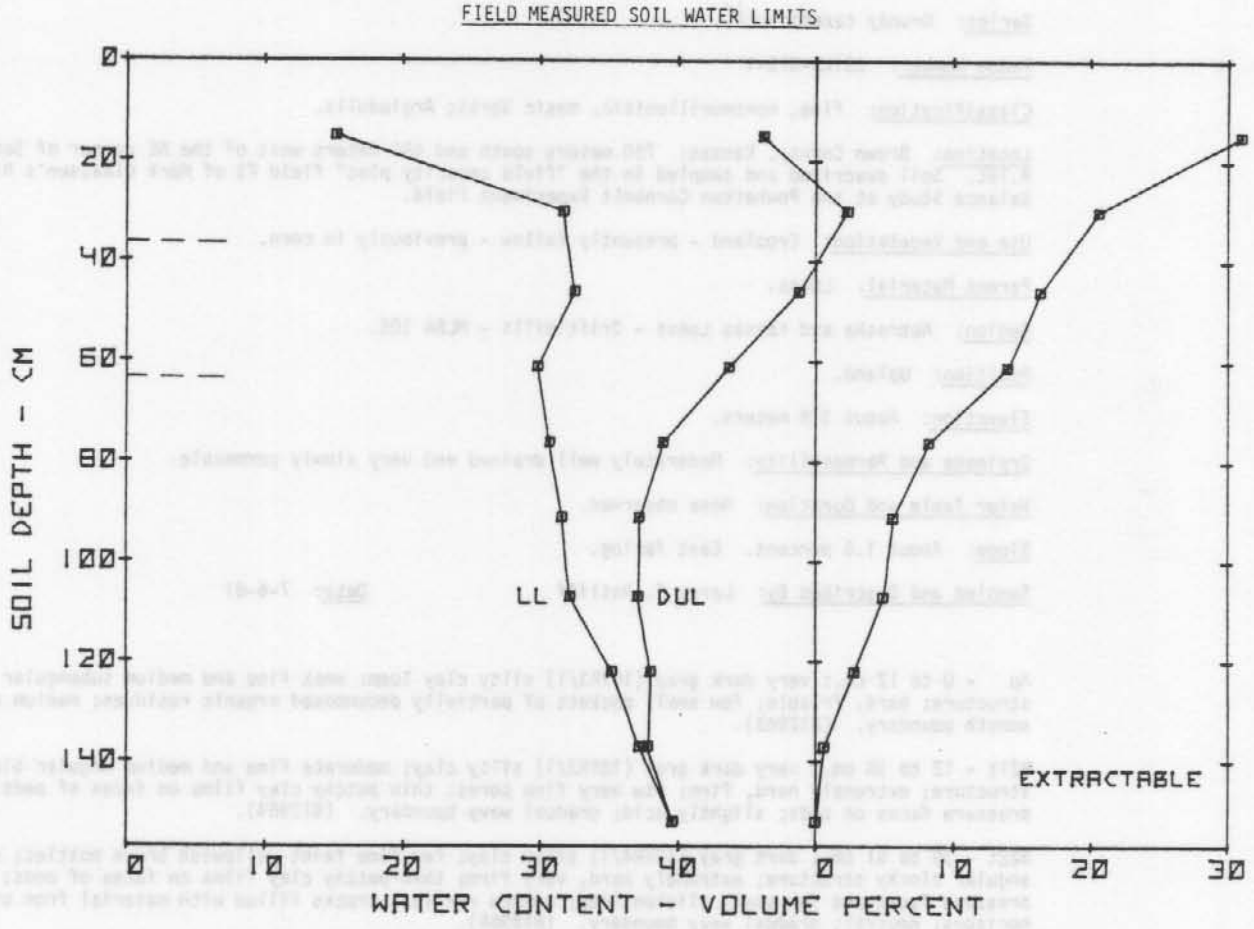
C1 - 122 to 152 cm.; gray (10YR5/1) silty clay loam; many medium and coarse prominant yellowish brown (10YR5/8) and strong brown (7.5YR4/6) mottles; massive; very hard, firm; common fine and medium pores, few coarse pores; moderately alkaline; gradual smooth boundary. (812968).

C2 - 152 to 185 cm.; gray (10YR5/1) silty clay loam; many medium and coarse prominant yellowish brown (10YR5/8) and strong brown (7.5YR4/6) mottles; massive; very hard, firm; common fine and medium pores, few coarse pores; mildly alkaline. (812969).

Remarks: [1/]Pedon differs from Grundy by having slightly higher COLE values. The C horizon was subdivided mainly for sampling purposes. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: M. M. Claassen, Kansas State University, Cornbelt Experiment Field, Powhattan, Kansas.

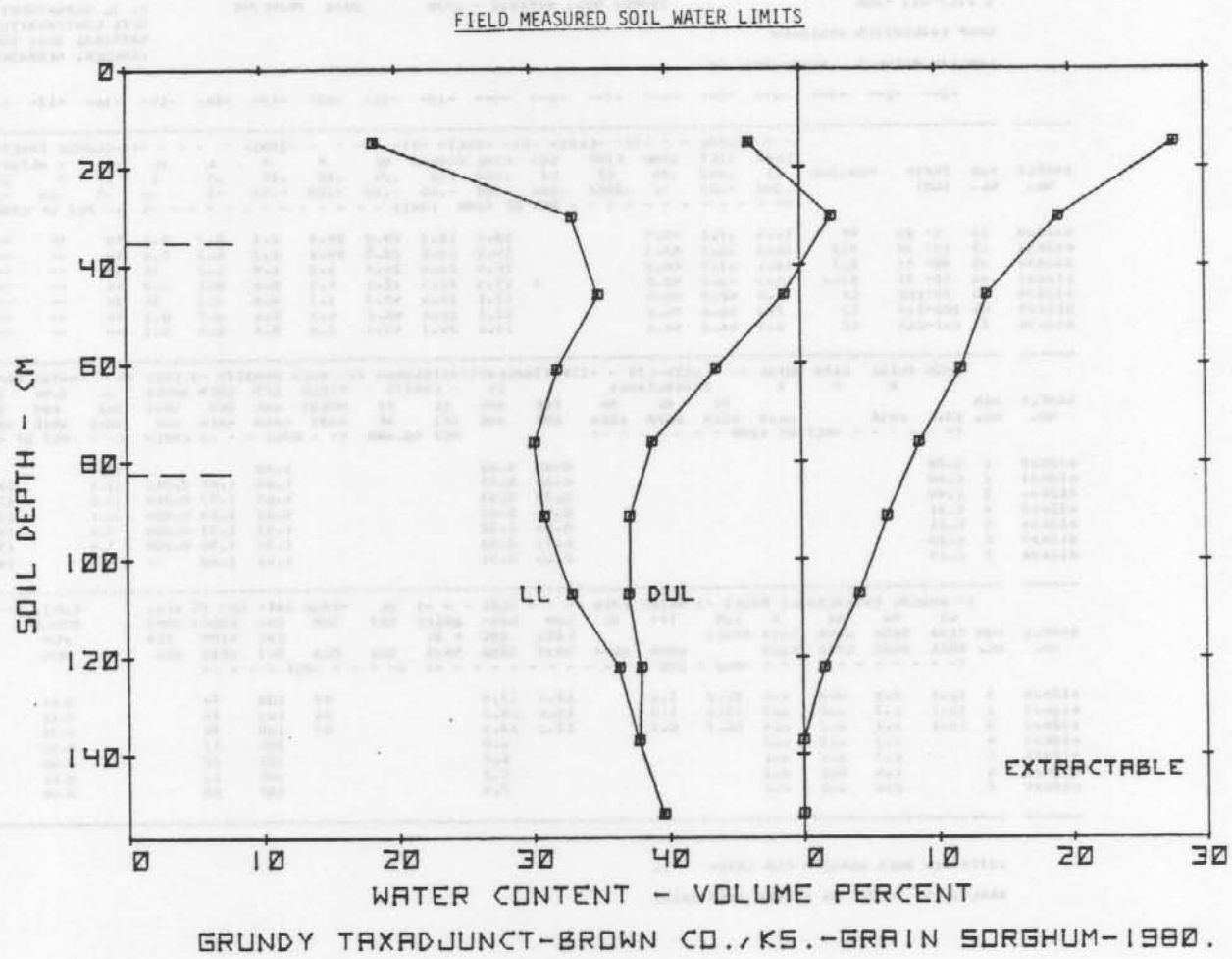
Pedon Number: S81KS-013-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	15.2	46.2	31.0
30	31.7	52.3	20.6
46	32.5	48.8	16.3
61	29.8	43.7	13.9
76	30.7	38.9	8.2
91	31.6	37.2	5.6
107	32.2	37.1	4.9
122	35.2	38.0	2.8
137	37.2	37.8	0.6
152	39.6	39.6	0.0

TOTAL WATER EXTRACTED FROM PROFILE = 18.1 Cm.

Pedon Number: S81KS-013-1



SOIL WATER Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
15	18.4	46.2	27.8
30	33.1	52.3	19.2
46	35.0	48.8	13.8
61	31.9	43.7	11.8
76	30.2	38.9	8.7
91	30.9	37.2	6.3
107	32.9	37.1	4.2
122	36.4	38.0	1.6
137	37.8	37.8	0.0
152	39.6	39.6	0.0

TOTAL WATER EXTRACTED FROM PROFILE = 16.3 Cm.

KIOWAN

CLASSIFICATION: COARSE-SILTY, MIXED, MESIC CALCIC HAPLOXEROLL

S 81CI-011 -001 SAMPLE NOS. 81P2830 - 2836 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05-.002	TOTAL SAND 2-.05	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND L .5-1	SAND VL 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	>75MM	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM (3B1) ->				
812830	1S	0- 10	AP	16.9	37.2	45.9			10.9	18.3	29.0	14.4	2.1	0.3	0.1	TR	TR	--	17	--
812831	2S	10- 30	A12	16.5	38.2	45.3			10.0	19.2	28.5	14.1	2.3	0.3	0.1	TR	--	--	17	--
812832	3S	30- 51	B21	18.1	37.9	44.0			14.4	23.5	34.4	8.0	1.4	0.2	TR	TR	--	--	10	--
812833	4S	51- 71	B3CA	14.3	43.2	42.5	1		15.4	27.3	37.1	4.4	0.8	0.1	0.1	TR	--	--	5	--
812834	5S	71-102	C1	8.4	42.7	48.4			17.1	25.8	43.3	3.7	0.8	0.6	TR	TR	--	--	5	--
812835	6S	102-137	C2	7.3	38.6	54.1			12.1	26.5	48.2	4.3	0.8	0.7	0.1	TR	--	--	6	--
812836	7S	137-203	C2	8.9	44.3	46.8			14.8	29.7	43.1	2.8	0.4	0.4	0.1	--	--	--	4	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6H3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4D2A	WHOLE SOIL 4C1	WRD
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->				CM/CM	<- - -PCT OF <2MM - ->					CM/CM
812830	1	C.78							0.62	0.42				1.60				11.4			7.1		
812831	2	C.80							0.66	0.45				1.60				11.9		16.0	7.5		0.15
812832	3	C.40							0.73	0.43				1.65	1.72	1.66	0.012	12.0		17.7	7.7		0.17
812833	4	C.32							0.56	0.42				1.61	1.63	1.61	0.004	10.1		17.3	6.0		0.19
812834	5	C.21							0.64	0.52				1.51	1.53	1.53	0.004	7.9		17.4	4.6		0.19
812835	6	C.18							0.71	0.51				1.53	1.55	1.55	0.004	5.8		15.5	3.7		0.18
812836	7	C.15							0.69	0.51				1.46	1.48	1.48	--	7.6		14.1	4.5		0.14

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B2A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS	CEC NH4- OAC 5A3A	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CACO3 AS RES. CAC0 <2MM 6E1G	OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->											<- - - - -PCT - - - ->						
812830	1	12.6	2.6	0.2	0.4	16.2	1.2		17.4	13.9			93	100	TR		0.43	7.1	7.5
812831	2	12.2	2.7	0.2	0.5	15.6	1.0		16.6	14.2			94	100	TR		0.42	7.0	7.3
812832	3	13.1	3.1	0.1	0.4	16.7	0.5		17.2	13.3			97	100	TR		0.38	7.4	7.9
812833	4		2.3	0.1	0.2					8.0				100	17		0.50	7.9	8.3
812834	5		1.7	0.1	0.1					5.7				100	22		0.60	7.8	8.3
812835	6		1.5	0.1	0.1					5.2				100	15		0.62	7.9	8.3
812836	7		2.0	0.1	0.2					7.9				100	18		0.46	7.9	8.3

ESTIMATED BULK DENSITY FOR LAYER 1,

ANALYSES: S= ALL OR SIEVED <2MM BASIS

Series: Kidman Variant[1/].

Pedon Number: S81UT-011-1

Classification: Coarse-silty, mixed, mesic Calcic Haploxerolls.

Location: Davis County, Utah: 210 meters east and 135 meters south of the NW corner of the SW 1/4, Sec. 2, T.3N, R.1W. Site is near the center of Plot #11 of J. Hanks' 1978 Corn Study at the Kaysville Experiment Farm.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Lake alluvium.

Region: Great Salt Lake Area - MLRA 28A.

Position: Upland. Slightly convex bench between mountain footslope and valley floor.

Elevation: About 1250 meters.

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: About 2 percent.

Sampled and Described By: Larry F. Ratliff Date 6-16-81

Ap - 0 to 10 cm.; dark brown (7.5YR3/2) loam; weak fine granular structure; hard, very friable; few fine roots; common wormcasts; mildly alkaline; clear smooth boundary. (812830).

A12 - 10 to 30 cm.; dark brown (7.5YR3/2) loam; weak fine and medium subangular blocky structure; hard, friable; few fine roots; common wormcasts; few pockets of Bt material; neutral; clear smooth boundary. (812831).

B2 - 30 to 51 cm.; brown (7.5YR4/4) loam; weak fine and medium subangular blocky structure; hard, firm; few fine roots and pores; few dark organic stains on faces of peds; occasional fine (<5 mm.) coarse fragment; thin patchy clay films on vertical faces of peds; moderately alkaline; clear smooth boundary. (812832).

B3ca - 51 to 71 cm.; brown (7.5YR5/4) loam; weak fine and medium platy parting to weak fine subangular blocky structure; slightly hard; friable; few fine roots and pores; common pockets of dark brown sandy clay loam; few fine threads and soft lumps of pale brown CaCO3; strong effervescence, moderately alkaline; gradual wavy boundary. (812833).

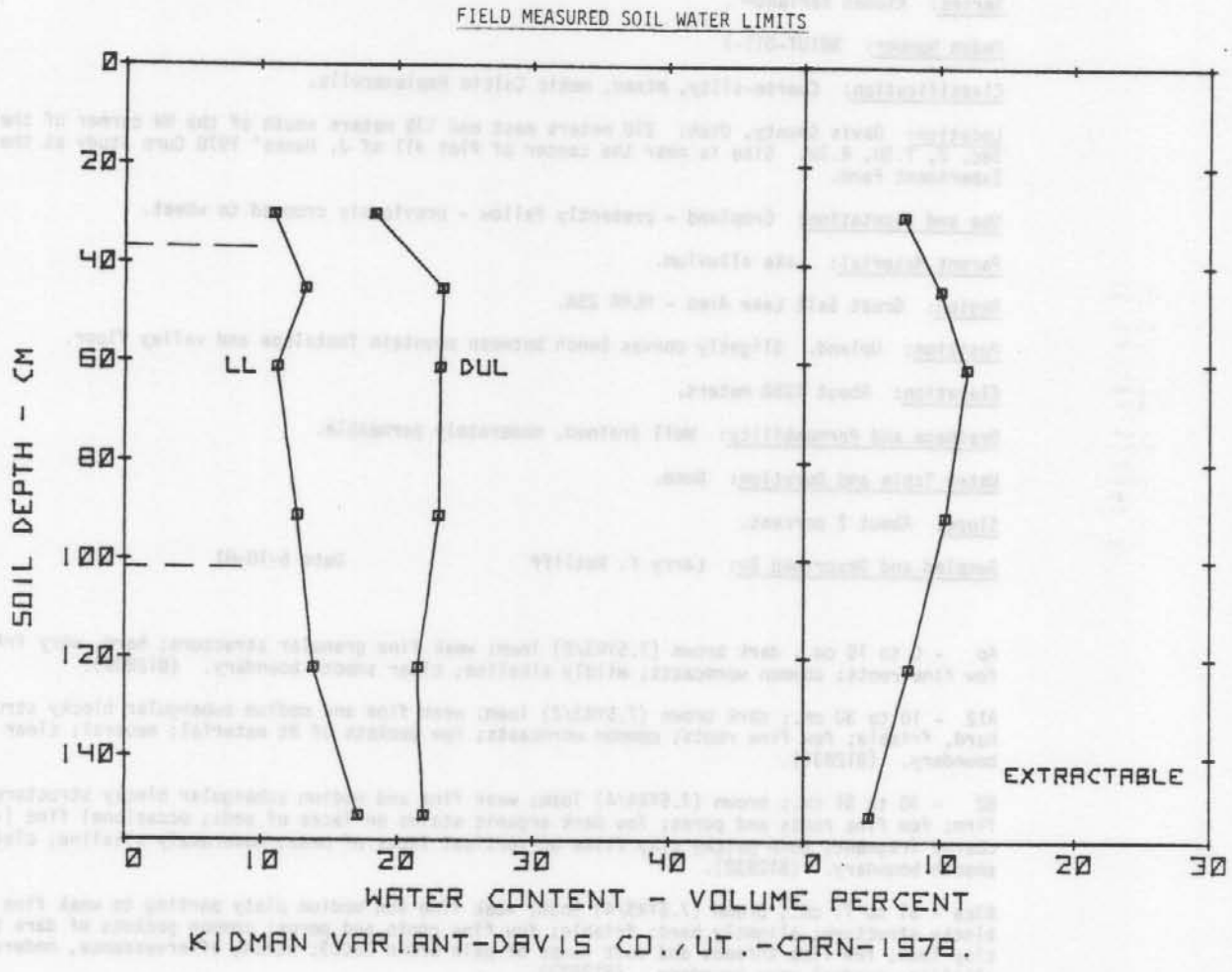
C1ca - 71 to 102 cm.; horizontally bedded brown (7.5YR4/4) and light brown (7.5YR6/4) light loam; individual strata are 2 to 20 mm. thick and part easily into plates; dark brown strata appear to be slightly more clayey than pale brown; few fine faint yellowish brown mottles; slightly hard; very friable; strong effervescence, moderately alkaline; diffuse wavy boundary. (812834).

C2 - 102 to 203 cm.; horizontally bedded brown (7.5YR4/4) and light brown (7.5YR6/4) light loam; individual strata are 2 to 20 mm. thick and part easily into plates; dark brown strata appear to be slightly more clayey than pale brown; few fine faint yellowish brown mottles; slightly hard; very friable; strong effervescence, moderately alkaline; diffuse wavy boundary. (812835, 836).

Remarks: [1/]Differs from Kidman by having slightly more silt and very fine sand in the control section than allowed in the series. The C1ca horizon has been slightly affected by weathering processes and strata are not as well expressed as in C2 horizon.

Field Measured Soil Water Data Contributed By: R. J. Hanks, Department of Soil Science and Biometeorology, Utah State University.

Pedon Number: S81UT-011-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	11.0	18.4	7.4
45	13.3	23.4	10.1
61	11.2	23.2	12.0
91	12.7	23.1	10.4
122	13.9	21.6	7.7
152	17.2	22.0	4.8

TOTAL WATER EXTRACTED FROM PROFILE = 14.1 Cm.

LAKE

CLASSIFICATION: HYPERTHERMIC, COATED TYPIC QUARTZIPSAMMENT

S 81PL-001 -GCI — SAMPLE NOS. 81P2624 - 2629 — DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1a1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	>2MM WT .1-75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
812624	1	0- 25	AP	2.4	1.3	96.3			--	1.3	5.1	50.3	35.5	5.3	0.1	TR	--	--	91	--
812625	2	25-112	C1	2.8	1.8	95.4			--	1.8	7.1	59.4	26.0	2.8	0.1	--	--	--	88	--
812626	3	112-157	C2	2.8	1.5	95.7			--	1.5	5.2	55.5	30.3	4.4	0.3	--	--	--	90	--
812627	4	157-208	C3	0.1	2.0	91.9		0.4	1.6	0.1	51.5	30.0	4.2	0.1	TR	--	--	--	86	--
812628	5	208-221	C4	2.4	3.7	93.9		0.8	2.9	7.5	52.4	29.5	4.4	0.1	--	--	--	--	86	--
812629	6	221-254	BT	10.9	2.3	86.8		--	2.3	4.6	42.6	33.1	6.2	0.3	TR	--	--	--	82	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B3A	EXTR P	EXTR S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6G2A	RATIO/CLAY CEC 8D1	RATIO/CLAY BAR 8D1	ATTERBERG LL 4F1	ATTERBERG PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - - ->				CM/CM
812624	1	0.57	0.030						0.54	0.58				1.60			1.8			1.4	
812625	2	0.16	0.010						0.25	0.39				1.60			1.3			1.1	
812626	3	0.12							0.25	0.43				1.70			1.5			1.2	
812627	4	0.12							0.39	0.38				1.70			2.8			2.3	
812628	5	0.11							0.33	0.54							1.7			1.3	
812629	6	0.13							0.26	0.41				1.85	1.90	0.009	5.3		7.5	4.5	0.06

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A	NH4OAC EXTRACTABLE BASES MG 5B5A	NH4OAC EXTRACTABLE BASES NA 5B5A	NH4OAC EXTRACTABLE BASES K 5B5A	NH4OAC EXTRACTABLE BASES SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	BASE SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->						1:2	1:1
812624	1	0.7	0.1	--	0.1	0.9	2.2		3.1	1.3			29	69				5.0	5.6
812625	2	0.2	--	--	0.1	0.3	1.5	0.1	1.8	0.7	0.4	25	17	43				4.6	5.1
812626	3	0.2	--	--	TR	0.2	1.8	0.2	2.0	0.8	0.4	50	10	25				4.4	5.0
812627	4	0.5	0.1	--	0.1	0.7	2.7	0.2	3.4	2.4	0.9	22	21	29				4.4	5.1
812628	5	0.3	TR	--	TR	0.3	1.8	0.2	2.1	0.8	0.5	40	14	37				4.4	5.0
812629	6	0.7	0.2	--	0.1	1.0	4.5	0.8	5.5	2.6	1.6	44	18	36				4.2	4.7

ESTIMATED BULK DENSITY FOR LAYER 1, 2, 3, 4,

ANALYSES: 5A ALL ON SIEVED <2MM BASIS

Series: Lake.[1/]

Pedon Number: S81FL-001-1

Classification: hyperthermic, coated Typic Quartzipsamments.[1/]

Location: Alachua County, Florida: NE 1/4, SW 1/4, Sec. 12, R.19E., T.10S. Site is in the center of the south boundary of plot I-1, Unit I of L. C. Hammond's 1980 Irrigation Study on the University of Florida's Irrigation Experimental Farm in Gainesville.

Use and Vegetation: Cropland - presently cropped to corn.

Parent Material: Sandy marine sediments of the lower Coastal Plain.

Region: South Central Florida Ridge - MLRA 154.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Excessively drained, rapidly permeable.

Water Table and Duration: None observed.

Slope: About 2 percent on a north facing upper side slope.

Sampled and Described By: Larry F. Ratliff Date: 5-7-81

Ap -- 0 to 25 cm.; dark brown (10YR3/3) fine sand; single grain; very friable, loose; many fine and medium roots; medium acid; clear smooth boundary. (812624).

C1 -- 25 to 112 cm.; brownish yellow (10YR6/6) fine sand; single grain; very friable, loose; few fine roots; few streaks of uncoated sand; few fine faint dark yellowish brown mottles; strongly acid; gradual smooth boundary. (812625).

C2 -- 112 to 157 cm.; yellow (10YR7/6) fine sand; single grain; very friable, loose; few fine roots; few pockets and lenses of uncoated sand; few strong brown lamella of fine sand that are less than 5 mm. thick; very strongly acid; gradual smooth boundary. (812626).

C3 -- 157 to 208 cm.; reddish yellow (7.5YR6/6) fine sand; single grain; very friable, loose; few pockets and lenses of uncoated sand; few dark reddish brown (2.5YR3/4) iron oxide nodules up to 1.5 cm. in diameter are at the lower boundary; strongly acid; gradual smooth boundary. (812627).

C4 -- 208 to 221 cm.; yellow (10YR7/6) fine sand; single grain; very friable, loose; few strong brown lamella of fine sand that are up to 2 mm. thick; strongly acid; clear wavy boundary. (812628).

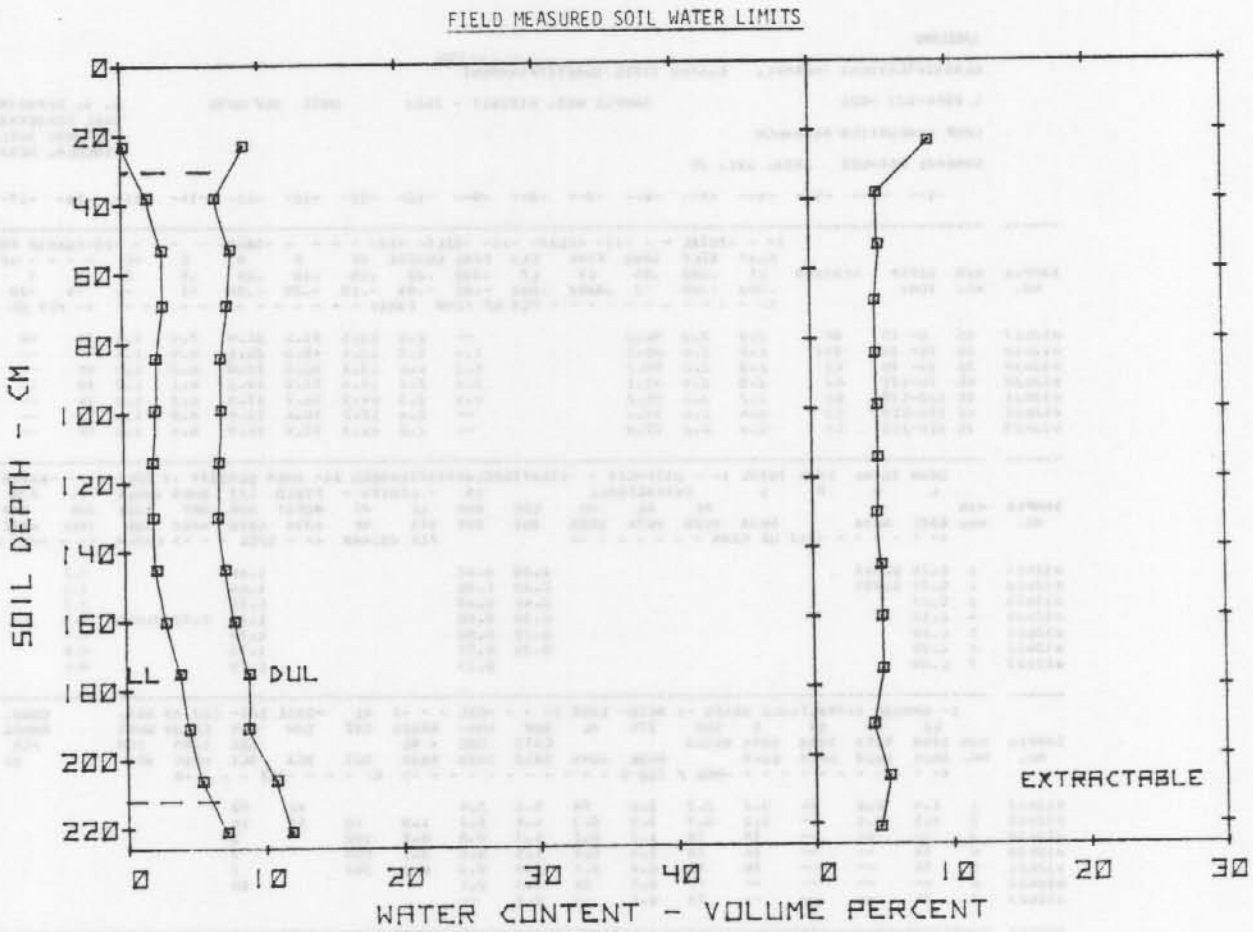
Bt -- 221 to 254 cm.; strong brown (7.5YR5/6) loamy sand; few fine distinct yellowish red (5YR5/6) mottles; weak coarse platy parting to weak fine subangular blocky structure; hard, friable; slightly compact and brittle in place; common fine and medium pores; sand grains coated and bridged with clay; very strongly acid. (812629).

Remarks: Colors are for moist soil. The C3 horizon may be a weakly expressed cambic horizon. The texture is slightly more clayey than the over and under-lying horizons.

[1/] Average percent silt plus clay of control section is 4.6 percent and suggests uncoated family and possible placement in the Astatula series. However, average water content at 2 Bars, yellowish colors, and presence of clean sand grains in the control section are evidence of coated.

Field Measured Soil Water Data Contributed By: L. C. Hammond, Soil Science Department, University of Florida.

Pedon Number: S81FL-001-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
23	0.2	8.9	8.7
38	1.9	6.8	4.9
53	2.9	7.9	5.0
69	2.9	7.6	4.7
84	2.4	7.1	4.7
99	2.3	7.1	4.8
114	2.1	6.9	4.8
130	2.1	6.8	4.7
145	2.3	7.3	5.0
160	2.9	7.9	5.0
175	3.9	8.9	5.0
191	4.5	8.8	4.3
206	5.4	10.8	5.4
221	7.2	11.9	4.7

TOTAL WATER EXTRACTED FROM PROFILE = 12.2 Cm.

LAKELAND

CLASSIFICATION: THERMIC, COATED TYPIC QUARTZIPSAMMENT

S 81FL-121 -001 SAMPLE NOS. 81P2617 - 2623 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	SILT CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	5 -20	20 -75	>2MM .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
812617	1S	0- 15	AP	2.0	2.0	96.0			--	2.0	13.5	51.6	21.9	7.9	1.1	TR	TR	--	82	TR
812618	2S	15- 33	AC2	1.2	2.8	96.2		1.6	1.0	10.4	48.8	26.1	9.5	1.4	--	--	--	--	86	--
812619	3S	33- 76	C1	2.0	2.8	95.2		1.2	1.6	13.2	50.0	23.0	8.0	1.0	TR	--	--	--	82	--
812620	4S	76-122	C2	2.0	2.9	95.1		0.8	2.1	15.8	53.0	19.2	6.1	1.0	TR	--	--	--	79	--
812621	5S	122-170	C2	1.2	3.1	95.7		0.8	2.3	14.7	56.2	17.5	6.3	1.0	TR	--	--	--	81	--
812622	6S	170-218	C3	0.9	2.6	97.0		--	2.6	12.2	50.6	23.9	8.9	1.4	TR	--	--	--	85	--
812623	7S	218-250	C4	0.8	2.2	97.0		--	2.2	10.5	55.6	16.9	6.4	1.6	TR	--	--	--	80	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	TOTAL S 6K3A	DITH-CIT EXTRACTABLE FE 6G2B	AL 6G7A	MN 6G2A	CEC 8U1	15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE	WATER CONTENT 2- 0.06 BAR 8A1A	1/3 BAR 8A1C	15 BAR 8A1C	WHOLE SOIL 8A2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->				CM/CM	<- - -PCT OF <2MM - ->				CM/CM
812617	1	0.76	0.043						1.20	0.65				1.60				2.2			1.3	
812618	2	0.71	0.035						2.25	1.08				1.60				2.3			1.3	
812619	3	0.27							0.40	0.05				1.70				1.7			1.3	
812620	4	0.12							0.30	0.50				1.70	1.72	0.004		1.3	6.4	3.2	1.0	0.04
812621	5	0.10							0.25	0.50				1.70				0.9			0.6	
812622	6	0.09							0.25	0.75				1.70				0.6			0.3	
812623	7	0.09								0.13				1.70				0.4			0.1	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID-ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	BASE SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->						1:2	1:1
812617	1	1.4	0.6	TR	0.2	2.2	3.0	TR	5.2	2.4			42	92					
812618	2	0.5	0.1	--	0.1	0.7	3.9	0.3	4.6	2.7	1.0	30	15	26				4.9	5.3
812619	3	--	--	--	TR	TR	1.7	0.2	1.7	0.8	0.2	100		2				4.5	4.9
812620	4	TR	--	--	TR	TR	1.5	0.1	1.5	0.6	0.1	100		3				4.6	4.8
812621	5	TR	--	--	TR	TR	0.9	0.1	0.9	0.3	0.1	100		7				4.5	4.9
812622	6	--	--	--	--	--	0.7	TR	0.7	0.1				10				4.5	4.9
812623	7	TR	--	--	--	TR	0.7	--	0.7	--								4.6	4.9
																		4.7	4.9

ESTIMATED BULK DENSITY FOR LAYER 1, 2, 3, 5, 6, 7,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

Series: Lakeland.[1/]

Pedon Number: S81FL-121-1

Classification: thermic, coated Typic Quartzipsamments.[1/]

Location: Suwannee County, Florida: SE 1/4, NE 1/4, Sec. 22, R.14E., T.2S. Center of Control-Plot 3 of L. C. Hammond's 1980 Irrigation Study on the Florida Agricultural Experiment Station near Live Oak.

Use and Vegetation: Cropland - presently in corn.

Parent Material: Sandy marine sediments of the Coastal Plain.

Region: North Central Florida Ridge - MLRA 138.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Excessively drained, very rapidly permeable.

Water Table and Duration: None observed within 250 cm.*

Slope: Less than 1 percent - slightly convex ridgetop.

Sampled and Described By: Larry F. Ratliff Date: 5-7-81

Ap -- 0 to 15 cm.; very dark grayish brown (10YR3/2) fine sand; single grain; very friable, loose; common fine and medium roots; few pockets of partially decomposed organic matter; strongly acid; clear smooth boundary. (812617).

A12 -- 15 to 33 cm.; very dark grayish brown (10YR3/2) sand; single grain; very friable, loose; common fine and medium roots; very strongly acid; clear smooth boundary. (812618).

C1 -- 33 to 76 cm.; yellowish brown (10YR5/6) fine sand; single grain; very friable, loose; few fine roots; very strongly acid; gradual smooth bounday. (812619).

C2 -- 76 to 170 cm.; brownish yellow (10YR6/6) fine sand; single grain; very friable, loose; few fine roots; few pockets and lenses of uncoated sand; very strongly acid; gradual smooth boundary. (812620, 621).

C3 -- 170 to 218 cm.; very pale brown (10YR7/4) fine sand, single grain; very friable, loose; few very fine roots; common fine distinct brownish yellow (10YR6/6,6/8) mottles; very strongly acid; clear wavy boundary. (810622).

C4 -- 218 to 250 cm.; white (10YR8/2) fine sand; single grain; very friable, loose; few fine distinct brownish yellow mottles; very strongly acid. (810623).

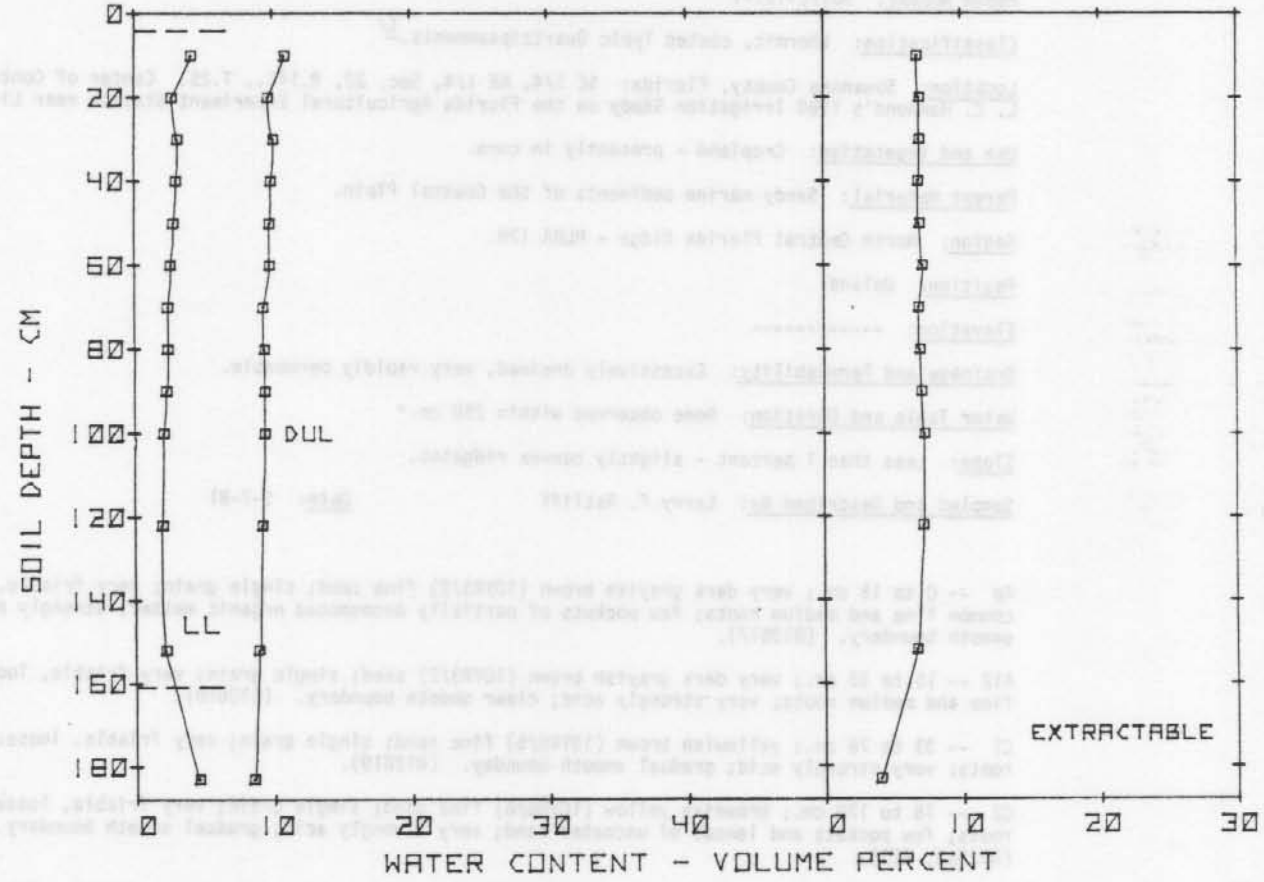
Remarks: Colors are for moist soil. Texture of mottles appears to be the same as for the matrix material. *Although no water table was observed in this pedon, it appears that free water is present in the C4 horizon during wet seasons. A well expressed spodic horizon was observed in borings from nearby plots at about 300 cm.

[1/] Average percent silt plus clay in control section is 4.7 percent and suggests uncoated family and possible placement in the Fripp series. However, average water content at 2 Bars, yellowish colors, and presence of clean sand grains in the control section are evidence of coated.

Field Measured Soil Water Data Contributed By: L. C. Hammond, Soil Science Department, University of Florida.

Pedon Number: S81FL-121-1

FIELD MEASURED SOIL WATER LIMITS



LAKELAND FS-SUWANNEE CO., FL.-CORN-1970.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	4.1	10.9	6.8
20	2.7	9.7	7.0
30	3.1	10.1	7.0
40	3.0	9.9	6.9
50	2.8	9.8	7.0
60	2.6	9.8	7.2
70	2.4	9.3	6.9
80	2.4	9.4	7.0
90	2.3	9.4	7.1
100	2.1	9.4	7.3
122	2.0	9.2	7.2
152	2.2	8.9	6.7
183	4.5	8.5	4.0

TOTAL WATER EXTRACTED FROM PROFILE = 13.0 Cm.

LEEPER

CLASSIFICATION: FINE, MONTMORILLONITIC, NONACID, THERMIC VERTIC HAPLAQUEPT

S 81MS-081-002 SAMPLE NOS. 81P1503 - 1507 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LI <.002 PCT OF <2MM	TOTAL SILT .002 -.05 PCT OF <2MM	TOTAL SAND .05 -2 PCT OF <2MM	TOTAL FINE .0002 LI	CLAY CC3 LT .002 PCT OF <2MM	SILT FINE .002 -.02 PCT OF <2MM	SILT COARSE .02 -.05 PCT OF <2MM	SAND VF .05 -.10 PCT OF <2MM	SAND F .10 -.25 PCT OF <2MM	SAND M .25 -.50 PCT OF <2MM	SAND C .5 -1 PCT OF <2MM	SAND VC 1 -2 PCT OF <2MM	COARSE FRACTIONS(MM)-WEIGHT 2 -5 PCT OF <75MM(3B1)	5 -20 PCT OF <75MM(3B1)	20 -75 PCT OF <75MM(3B1)	.1-75 PCT OF <75MM(3B1)	WT PCT OF WHOLE SOIL
811503	1S	0- 13	AP	35.7	55.2	9.1		37.0	18.2	4.6	3.8	0.5	0.1	0.1	--	TR	--		4	--
811504	2S	13- 25	A12	42.5	51.0	6.5		35.2	15.8	3.4	2.7	0.3.	TR	0.1	--	--	--		3	--
811505	3S	25- 61	B21	34.0	47.3	18.7		30.7	16.6	7.4	10.3	0.7	0.2	0.1	TR	--	--		11	--
811506	4S	61-102	B22	30.1	40.0	23.9		25.2	14.8	9.2	13.5	1.0	0.1	0.1	--	--	--		15	--
811507	5S	102-152	B22	39.4	39.9	20.7		24.3	15.6	8.6	11.2	0.7	0.1	0.1	--	--	--		12	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	EXTR S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6U2A	CEC 8D1	15 BAR 8D1	LIMITS - LL 4F1 PCT <0.4MM	LIMITS - PI	FIELD 1/3 MOIST 4A3A G/CC	OVEN DRY 4A1D G/CC	WHOLE SOIL 4D1 CM/CM	WATER CONTENT 2-0.06 BAR 4B1A PCT OF <2MM	0.06 1/3 BAR 4B1C PCT OF <2MM	1/3 15 BAR 4B2A PCT OF <2MM	15 BAR 4C1 CM/CM	WRD WHOLE SOIL
811503	1	1.60							0.71	0.34			1.49	1.75	0.055	19.6	24.3	22.0	13.8	0.12
811504	2	1.29							0.65	0.34			1.48	1.74	0.055	23.8	28.9	25.9	16.6	0.14
811505	3	0.91							0.67	0.42			1.46	1.74	0.060	21.0	28.5	25.3	14.4	0.16
811506	4	0.60							0.64	0.43			1.44	1.78	0.073	22.6		25.5	15.6	0.14
811507	5	0.50							0.64	0.43			1.40			23.5			17.0	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6D2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4-OAC 5A4B	BASES + AL 5A3B	BASE SAT SUM 5G1	BASE SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. UMHS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- MEQ / 100 G ->										<- PCT ->						
811503	1	25.9	0.8	0.1	0.5	27.3	2.0		29.3	25.4		93	100	--			7.1	7.6
811504	2	30.0	0.8	0.2	0.4	31.8	1.9		33.7	27.5		94	100	--			7.4	7.7
811505	3	24.6	0.2	0.1	0.3	25.2	3.7		28.4	22.9		87	100	--			7.1	7.6
811506	4	22.7	0.3	0.2	0.4	23.6	1.1		24.7	23.1		96	100	--			7.3	7.9
811507	5	24.7	0.4	0.2	0.4	25.7	2.1		27.8	25.4		92	100	--			7.4	8.0

SAMPLE NO.	HZN NO.	MINERALOGY CLAY <2U X-RAY 7A21	7A21	7A21	7A21	DTA <2U 7A3	7A3	TOT ANL CLAY K2O 6Q3A	Fe 6G7A
		<- RELATIVE AMOUNTS ->						<- PCT ->	
811503	1								
811504	2								
811505	3	MI 4	KK 3	MI 1	VR 1	KK25		1.2	5.9
811506	4								
811507	5								

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 35 PCT .1-75MM 13

ESTIMATED BULK DENSITY FOR LAYER S.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL KK KAOLINITE MI MICA VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Leeper[1/].

Pedon Number: S81MS-081-2

Classification: Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts.

Location: Lee County, Mississippi: 125 meters east and 150 meters south of the NW corner of the SW 1/4, Sec. 36, T.10S., R.5E. Treatment 10 - Rep. 2 of F. Whisler's 1980 monocropped soybean study at the Verona Agric. Exp. Station.

Use and Vegetation: Presently fallow - previously cropped to soybeans.

Parent Material: Clayey alluvium.

Region: Alabama, Mississippi and Arkansas Blackland - MLRA 135.

Position: Bottomland.

Elevation: About 80 meters.

Drainage and Permeability: Somewhat poorly drained, slowly permeable.

Water Table and Duration: Perched water observed at about 60 cm.

Slope: About 0.5 percent.

Sampled and Described By: Larry F. Ratliff and F. Whisler Date: 2-25-81

Ap -- 0 to 13 cm.; very dark grayish brown (10YR3/2) silty clay loam; weak fine subangular blocky structure; very hard, firm; common fine roots; mildly alkaline; clear smooth boundary. (811503).

A12 -- 13 to 25 cm.; dark grayish brown (10YR4/2) silty clay; massive, well expressed plow pan; extremely hard, very firm; few fine roots and pores; mildly alkaline; clear smooth boundary. (811504).

B21 -- 25 to 61 cm.; dark gray (10YR4/1) silty clay loam; few fine distinct yellowish brown (10YR5/6) mottles; moderate fine and medium angular blocky structure; extremely hard, very firm; few fine roots; few fine and medium pores; many pressure faces on ped surfaces; mildy alkaline; gradual wavy boundary. (811505).

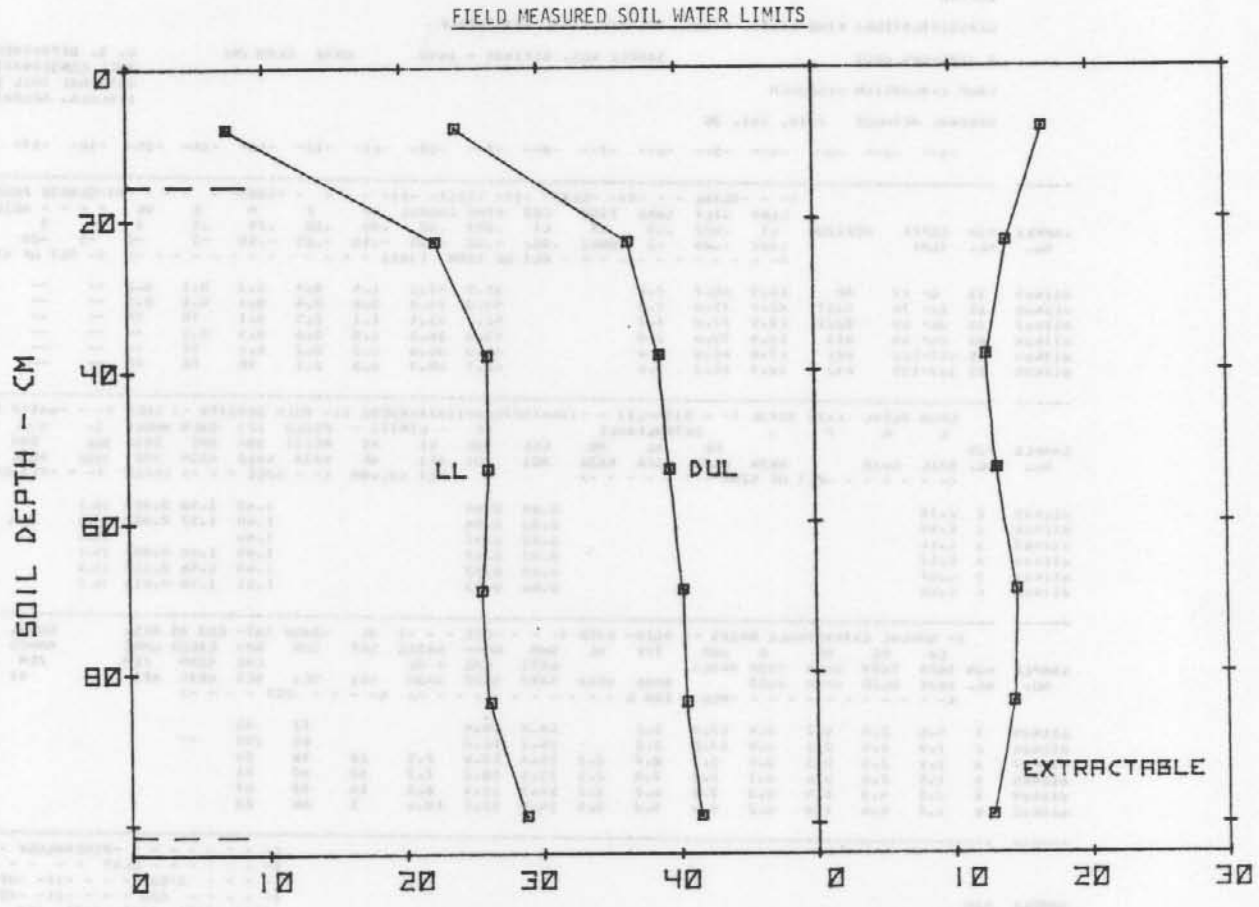
B22 -- 61 to 152 cm.; gray (10YR5/1) heavy clay loam; common fine distinct yellowish brown (10YR5/8) and few fine distinct yellowish red (5YR5/6) mottles; weak fine and medium angular blocky structure; extremely hard, extremely firm; many pressure faces on ped surfaces; moderately alkaline. (811506, 507).

Remarks: Colors are for moist soil. No core samples collected for sample No. 811507 because of wetness.

[1/] Differs from typical Leeper soils by being more gray in the upper B horizon.

Field Measured Soil Water Data Contributed by: F. D. Whisler, Department of Agronomy and Soils, Mississippi State University.

Pedon Number: S81MS-081-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	7.3	24.0	16.7
23	22.5	36.5	14.0
38	26.2	38.7	12.5
53	26.2	39.4	13.2
69	25.7	40.3	14.6
84	26.2	40.5	14.3
99	28.8	41.5	12.7

TOTAL WATER EXTRACTED FROM PROFILE = 14.9 Cm.

LEMING

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC TYPIC FRAGIUDALF

S 81MS-049 -001 SAMPLE NOS. 81P1485 - 1490 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05	TOTAL SAND 2	TOTAL FINE .0002	CLAY CO3 .002	SILT FINE .002	SILT COARSE .02	SAND VF .05	SAND F .10	SAND M .25	SAND C .5	SAND VC 1	COARSE FRACTIONS(MM) 2	5	20	>2MM WEIGHT .1-	>2MM WEIGHT 75	>2MM WT PCT OF WHOLE
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				SOIL
81148S	1S	0- 13	AP	10.9	80.7	2.4			35.5	45.2	1.4	0.4	0.3	0.1	0.2	--	--	--	1	--	
81148E	2S	13- 36	B21T	22.7	75.8	1.5			40.0	35.8	0.8	0.4	0.1	0.1	0.1	--	--	--	1	--	
81148T	3S	36- 69	B22T	20.5	77.8	1.7			42.7	35.1	1.1	0.5	0.1	TR	TR	--	--	--	1	--	
81148B	4S	69- 99	B3T	18.4	79.6	2.0			43.0	36.6	1.0	0.6	0.3	0.1	--	--	--	--	1	--	
81148S	5S	107-122	B4T	17.6	81.6	0.8			45.0	36.6	0.5	0.2	0.1	TR	--	--	--	--	TR	--	
81149C	6S	127-155	B4T	18.4	81.0	0.6			41.7	39.3	0.5	0.1	TR	TR	TR	--	--	--	TR	--	

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6K3A	EXTRACTABLE FE 6L2B	AL 6G7A	MN 6D2A	CEC 8D1	TRATIC/CLAY 15 BAR 8D1	ATTERBERG LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1M	WHOLE SOIL 4D1	COLE 1/3 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->				CM/CM	<- - -PCT OF <2MM - ->			CM/CM
81148S	1	2.18							0.85	0.64			1.40	1.48	0.019	16.7			27.5	10.8	0.23
81148E	2	0.49							0.53	0.46			1.40	1.52	0.028	16.5	54.4	26.4	10.4	0.22	
81148T	3	0.16							0.52	0.47			1.40			16.5			9.7		
81148B	4	0.12							0.55	0.47			1.45	1.48	0.007	15.1		23.4	8.6	0.21	
81149S	5	0.07							0.65	0.52			1.49	1.56	0.015	15.4		22.5	9.2	0.20	
81149C	6	0.06							0.66	0.53			1.51	1.58	0.015	16.2		22.7	9.7	0.20	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6A2D	NA 5B5A 6A2B	K 5B5A 6A2B	SUM BASES 6A2B	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM CAL 5C3	SAT- NH4 CACO3 <2MM 5C1	CO3 AS CACO3 6E1G	RES. GMMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->										<- - - - -PCT - - - ->							
81148S	1	9.6	2.9	0.2	0.9	13.6	5.2		18.8	14.4			72	94					5.8	6.3	
81148E	2	7.9	3.9	0.3	0.9	13.0	3.2		16.2	12.0			80	100	--				6.5	7.1	
81148T	3	2.1	2.5	0.3	0.4	5.3	8.7	2.2	14.4	10.6	7.9	28	40	54					4.2	4.6	
81148B	4	1.5	2.8	0.6	0.3	5.2	7.9	2.5	13.1	10.2	7.7	32	40	51					4.0	4.5	
81149S	5	2.1	4.3	0.9	0.3	7.6	6.7	1.2	14.3	11.4	8.8	14	53	67					4.1	4.8	
81149C	6	3.7	5.6	1.0	0.2	9.4	5.0	0.5	14.4	12.1	10.4	5	66	82					4.5	5.3	

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	CLAY X-RAY <2U 7A2I	CLAY X-RAY <2U 7A2I	CLAY X-RAY <2U 7A2I	DTA <2U 7A3	DTA <2U 7A3	TOT ANL CLAY K2O 603A	TOT ANL CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81148S	1	MI 3	KK 3	MI 2	VR 1	KK2B		1.8	8.0
81148E	2								
81148T	3								
81148B	4								
81149S	5								
81149C	6								

FAMILY CONTROL SECTION: DEPTH 13- 63 PCT CLAY 22 PCT .1-75MM 1

ESTIMATED BULK DENSITY FOR LAYER 3.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL KK KAOLINITE MI MICA VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Loring.

Pedon Number: S81MS-049-1

Classification: Fine-silty, mixed, thermic Typic Fragiudalfs.

Location: Hinds County, Mississippi: SW 1/4 of the NW 1/4, Sec. 34, T.5N., R.3W. Treatment 1 - Rep. 1 of F. Whisler's 1980 Tillage Plots at the Brown Loam Experiment Station near Raymond.

Use and Vegetation: Cropland - presently in winter wheat with a soybean rotation.

Parent Material: Loess mantle.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Upland.

Elevation: About 65 meters.

Drainage and Permeability: Moderately well drained, moderately permeable above the fragipan and slowly permeable in the fragipan.

Water Table and Duration: Perched above the pan during wet seasons.

Slope: About 1 percent. Convex.

Sampled and Described By: Larry F. Ratliff Date: 2-24-81

Ap -- 0 to 13 cm.; brown (10YR4/3) silt loam; massive; hard, friable; many fine and medium roots; common pockets of partially decomposed organic matter; slightly acid; clear smooth boundary. (811485).

B21t -- 13 to 36 cm.; brown (7.5YR4/4) heavy silt loam; weak fine and medium subangular blocky structure; very hard, friable; common fine roots; few fine pores; common fine and medium faint pale brown (10YR6/3) mottles; thin patchy clay films on vertical faces of peds; neutral; clear wavy boundary. (811486).

B22t -- 36 to 69 cm.; brown (7.5YR4/4) silt loam; weak fine subangular blocky structure; very hard, friable; many fine and medium roots; few fine pores; A'2 material makes up about 20 percent of the horizon and is pale brown (10YR6/3) and light brownish gray (10YR6/2); very strongly acid; clear wavy boundary. (811487).

Bx1 -- 69 to 127 cm.; mottled light gray (10YR7/2) brown (7.5YR4/4) and strong brown (7.5YR5/6) silt loam; brown parts are brittle and compact in place, gray parts slightly more silty than brown parts; weak medium platy parting to weak fine and medium subangular blocky structure; few fine roots observed at 90 cm.; common fine and medium pores; very strongly acid; gradual wavy boundary. (811488, 489).

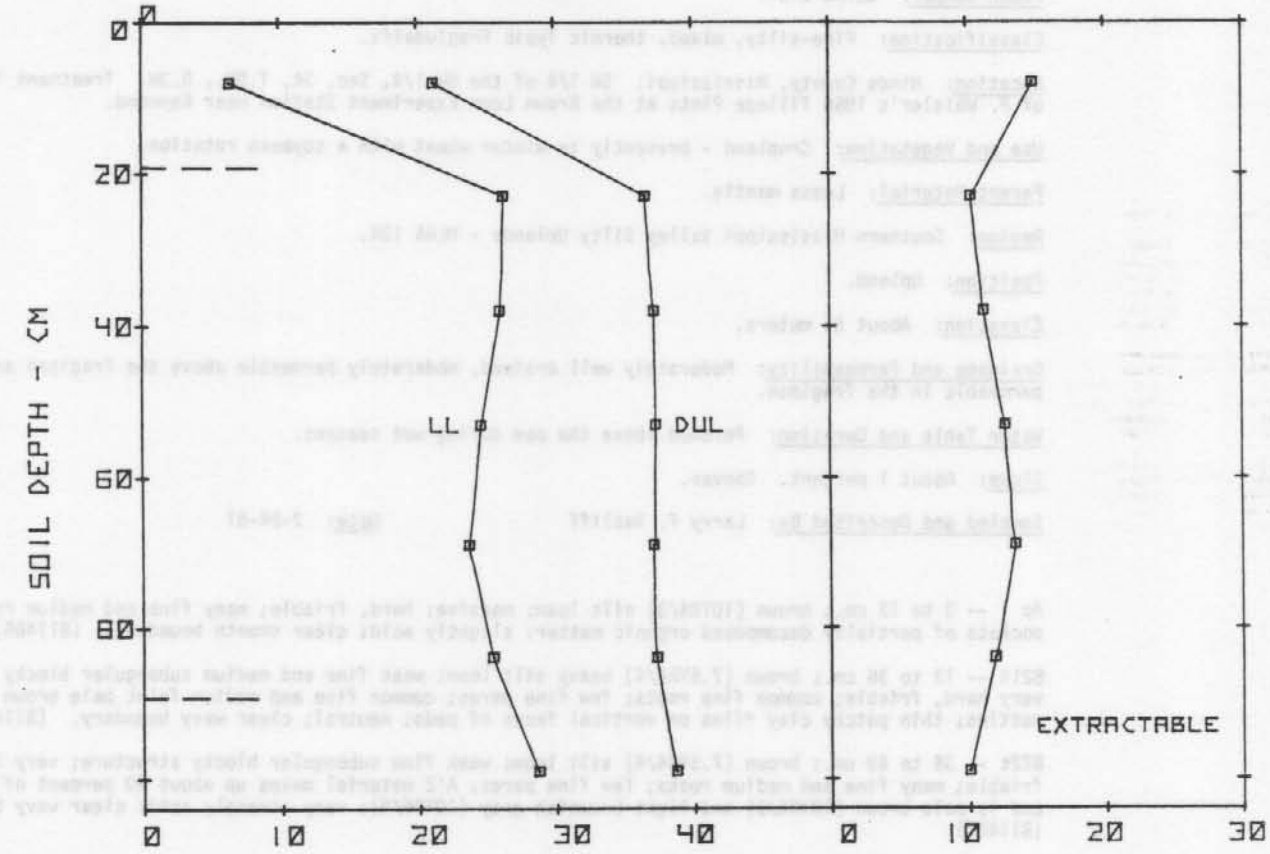
Bx2 -- 127 to 155 cm.; strong brown (7.5YR5/6) silt loam; estimated 30 percent light gray (10YR7/2) silt seams: brown part is compact and brittle in place; weak fine subangular blocky structure; extremely hard, firm; common fine and medium pores; strongly acid. (811490).

Remarks: Colors are for moist soil.

Field Measured Soil Water Data Contributed By: F. D. Whisler, Dept. of Agronomy and Soils, Mississippi State University.

Pedon Number: S81MS-049-1

FIELD MEASURED SOIL WATER LIMITS



LORING SIL-HINDS CO./MS.-SOYBEANS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	6.4	21.2	14.8
23	26.3	36.6	10.3
38	26.0	37.2	11.2
53	24.6	37.3	12.7
69	23.7	37.1	13.4
84	25.4	37.3	11.9
99	28.7	38.7	10.0

TOTAL WATER EXTRACTED FROM PROFILE = 12.9 Cm.

LCRING

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC, TYPIC FRAGIUDALF

S 81TN-157 - 1 SAMPLE NOS. 81P1512 - 1517 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE .0002	CO3 CLAY LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.5	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	COARSE FRACTIONS(MM) WEIGHT 5-20	COARSE FRACTIONS(MM) WEIGHT .1-75	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1) ->			
811512	1S	0- 15	AP	14.7	81.9	3.4			27.8	54.1	2.4	0.7	0.1	0.1	0.1	TR	--	--	1	--
811513	2S	15- 36	B21T	18.5	70.1	1.4			34.3	35.8	1.1	0.2	0.1	TR	TR	--	--	--	TR	--
811514	3S	36- 58	B22T	24.7	74.0	1.3			37.5	36.5	1.0	0.2	0.1	TR	--	--	--	--	TR	--
811515	4S	58- 89	B23T	21.7	76.6	1.7			36.9	37.7	1.3	0.2	0.2	TR	TR	--	--	--	TR	--
811516	5S	89-135	BX1	18.4	80.1	1.5			39.7	40.4	1.2	0.2	0.1	TR	--	--	--	--	TR	--
811517	6S	135-156	BX2	19.7	78.7	1.6			37.7	41.0	1.2	0.3	0.1	TR	TR	--	--	--	TR	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6A3A	DITH-CIT EXTRACTABLE FE 6C2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6D2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - - ->							PCT <0.4MM		<- - G/CC - - ->				CM/CM	<- - -PCT OF <2MM - ->				CM/CM	
811512	1	C.66							0.50	0.41				1.44	1.50	0.014	10.0	27.4	21.6	6.0	0.22
811513	2	C.28							0.49	0.42				1.47	1.60	0.029	18.4	27.8	24.9	12.1	0.19
811514	3	C.18							0.55	0.45				1.39	1.50	0.026	18.1		26.3	11.2	0.21
811515	4	C.14							0.53	0.44				1.41	1.46	0.012	16.1		26.0	9.5	0.23
811516	5	C.08							0.59	0.49				1.45	1.50	0.011	15.4		25.1	9.0	0.23
811517	6	0.06							0.63	0.50				1.49	1.51	0.004	15.9		24.3	9.8	0.22

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	NH4OAC EXTRACTABLE BASES MG 5B5A 6U2D	NH4OAC EXTRACTABLE BASES NA 5B5A 6P2B	NH4OAC EXTRACTABLE BASES K 5B5A 6U2B	NH4OAC EXTRACTABLE BASES SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 1:1 8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->								
811512	1	4.7	1.2	TR	0.5	6.4	3.2		9.6	7.4			67	86				5.5	6.2
811513	2	7.4	3.5	0.7	0.4	12.0	5.9	0.4	17.9	14.1	12.4	3	67	85				4.9	5.3
811514	3	4.4	3.4	0.3	0.3	8.4	8.6	2.0	17.0	13.5	10.4	19	49	62				4.4	4.8
811515	4	2.4	3.0	0.2	0.3	5.9	8.6	2.6	14.5	11.6	8.5	31	41	51				4.2	4.7
811516	5	2.8	3.5	0.3	0.3	6.9	7.2	1.3	14.1	10.9	8.2	16	49	63				4.3	4.8
811517	6	4.5	4.3	0.3	0.3	9.4	6.7	0.8	16.1	12.4	10.2	8	58	76				4.6	5.1

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
811512	1								
811513	2								
811514	3	HT 3	KK 3	MI 2	VR 1	KK25		1.7	8.8
811515	4								
811516	5								
811517	6								

FAMILY CONTROL SECTION: DEPTH 15- 05 PCT CLAY 26 PCT .1-75MM 0

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL KK KAOLINITE MI MICA VR VERMICULITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Loring.

Pedon Number: S81TN-157-1

Classification: Fine-silty, mixed, thermic Typic Fragiudalfs.

Location: Shelby County, Tennessee: One mile southeast from the community of Bolton on Pleasant Ridge Road and 282 meters north in cultivated field.

Use and Vegetation: Cropland - presently in cotton.

Parent Material: Loess.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Moderately well drained; moderately permeable above the fragipan, slowly permeable below.

Water Table and Duration: Perched at about 90 cm. during winter and early spring.

Slope: About 1 percent.

Sampled and Described By: Bill Brown and Larry F. Ratliff Date: 2-27-81

Ap - 0 to 16 cm.; brown (10YR4/3) silt loam; moderate medium platy structure; friable; common fine and medium roots; slightly acid; abrupt smooth boundary. (811512).

B21t - 16 to 36 cm.; dark yellowish brown (10YR4/4) and dark brown (7.5YR4/4) silty clay loam; moderate medium subangular blocky structure; friable; common thin dark brown (7.5YR4/4) clay films mostly on vertical ped faces; common fine and medium roots; few fine and medium pores; strongly acid; clear smooth boundary. (811513).

B22t - 36 to 59 cm.; dark yellowish brown (10YR4/4) and dark brown (7.5YR4/4) silt loam; moderate medium subangular blocky structure; friable; common thin dark brown (7.5YR4/4) clay films mostly on vertical ped faces; common fine and medium roots; few fine and medium pores; few horizontal tube-shaped pockets of brown silt loam that are 1 to 3 cm. in diameter; very strongly acid; clear smooth boundary. (811514).

B23t - 59 to 89 cm.; dark yellowish brown (10YR4/4) and dark brown (7.5YR4/4) silt loam; common medium black stains; weak coarse prismatic parting to moderate medium subangular blocky structure; friable; common thin dark brown (7.5YR4/4) clay films mostly on vertical ped faces; common large pale brown (10YR6/3) silt coatings on vertical prism faces; common fine and medium roots; few fine and medium pores; very strongly acid; clear wavy boundary. (811515).

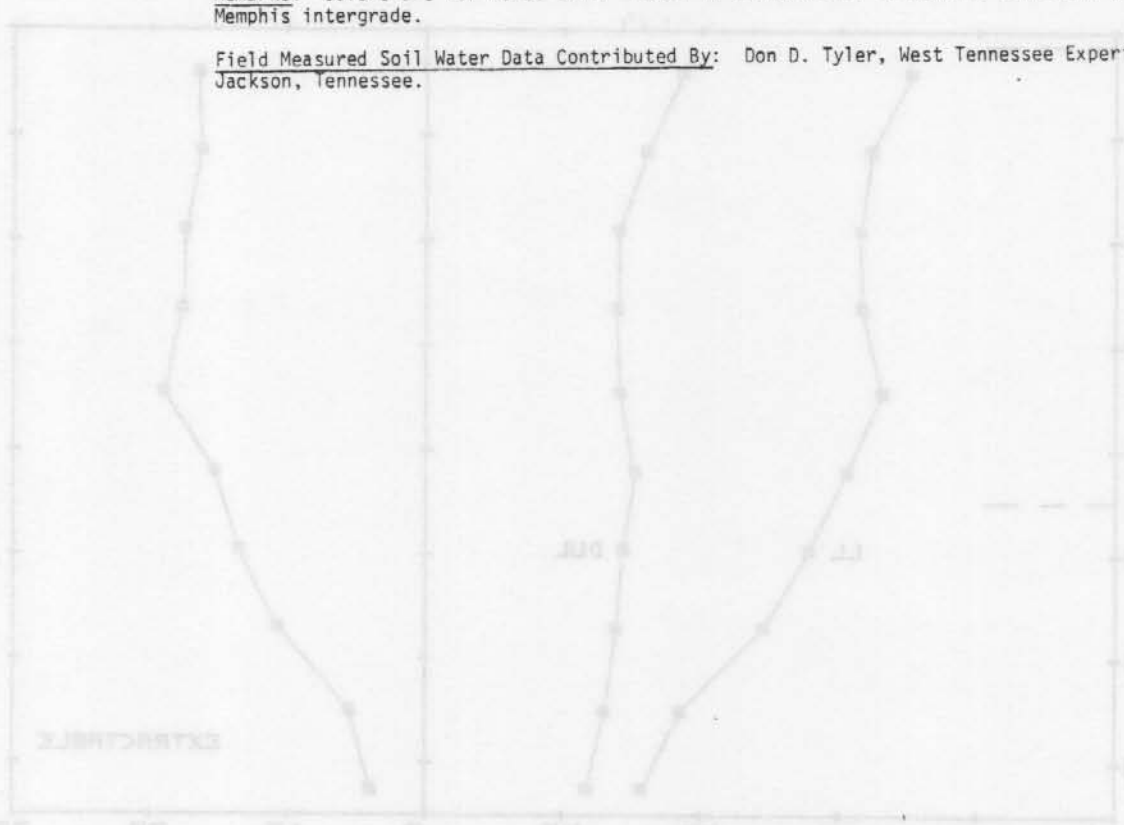
BX1&A'2 - 89 to 135 cm.; dark yellowish brown (10YR3/4) and dark brown (7.5YR4/4) silt loam; common medium pale brown (10YR6/3) and few medium light brownish gray (10YR6/2) mottles; moderate coarse prismatic structure; thin light brownish gray (10YR6/2) silt coatings on vertical prism faces; firm, brittle; few small dark concretions; few fine pores; about 25 percent by volume of vertical tongues of pale brown (10YR6/3) and light brownish gray (10YR6/2) silt or silt loam that are 1 to 6 cm. wide; very friable; common fine and medium pores; common fine and medium roots in the upper part of tongues; very strongly acid; gradual smooth boundary. (811516).

BX2&A'2 - 135 to 157 cm.; dark yellowish brown (10YR3/4) silt loam; common medium yellowish brown (10YR5/4), pale brown (10YR6/3) and light brownish gray (10YR6/2) mottles; moderate coarse prismatic structure; very firm, brittle; common fine and very fine pores; about 20 percent by volume of vertical tongues that are pale brown (10YR6/3) and light brownish gray (10YR6/2) silt or silt loam 0.5 to 6 cm. wide; very friable; few small black concretions; few fine and very fine pores; strongly acid; gradual smooth boundary. (811517).

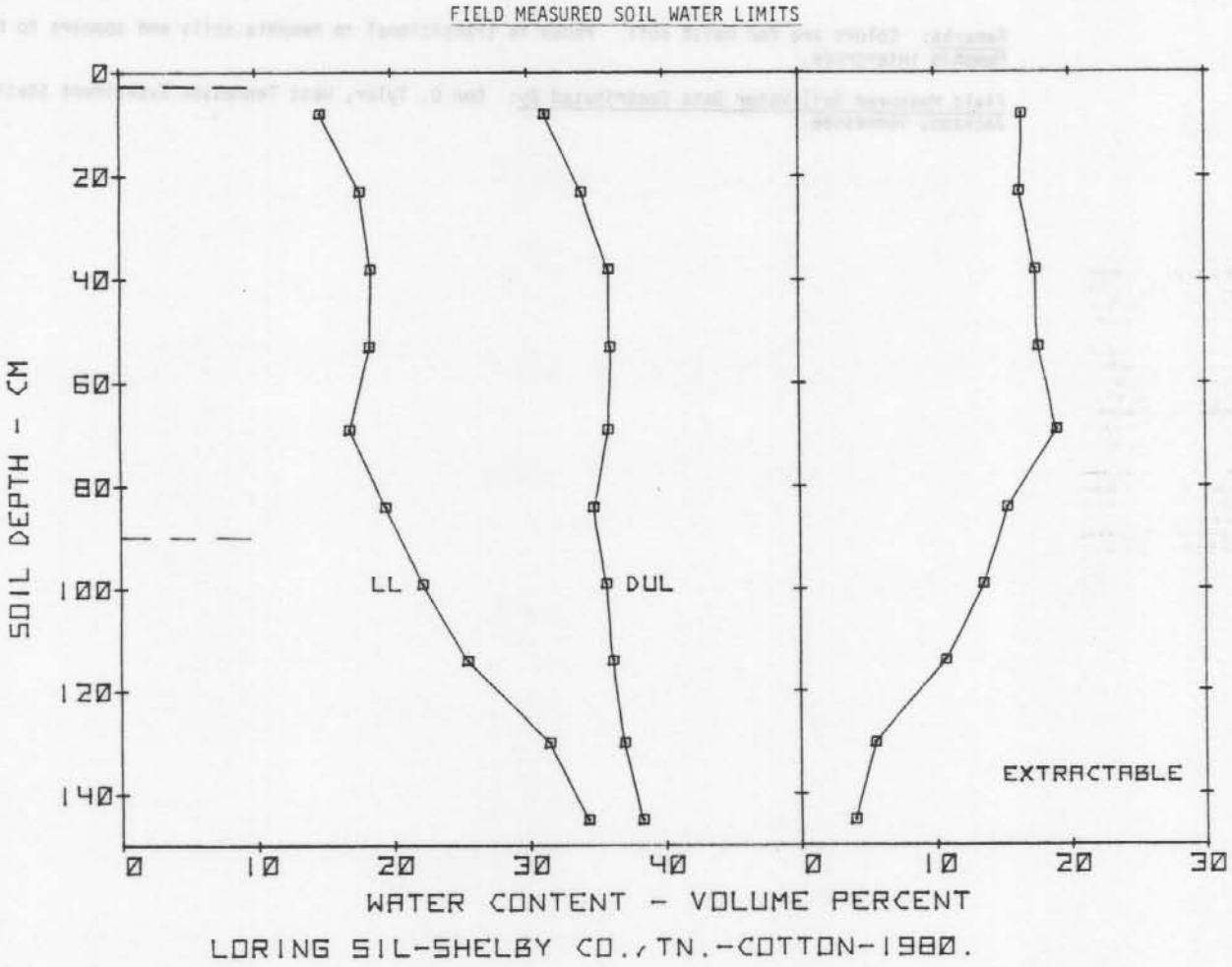
BX3 - 157 to 205 cm.; dark yellowish brown (10YR3/4,4/4) silt loam; common medium yellowish brown (10YR5/4), light brownish gray (10YR6/2), and pale brown (10YR6/3) mottles; weak very coarse prismatic structure; firm, slightly brittle; common fine and very fine pores; about 15 percent by volume of vertical tongues that are pale brown (10YR6/3) and light brownish gray (10YR6/2) friable; common fine pores; strongly acid.

Remarks: Colors are for moist soil. Pedon is transitional to Memphis soils and appears to be a Loring - Memphis intergrade.

Field Measured Soil Water Data Contributed By: Don D. Tyler, West Tennessee Experiment Station, Jackson, Tennessee.



Pedon Number: S81TN-157-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	14.8	31.3	16.5
23	17.7	34.0	16.3
38	18.5	36.0	17.5
53	18.4	36.1	17.7
69	16.9	35.9	19.0
84	19.5	34.8	15.3
99	22.2	35.7	13.5
114	25.5	36.2	10.7
130	31.5	37.0	5.5
145	34.3	38.3	4.0

TOTAL WATER EXTRACTED FROM PROFILE = 20.7 Cm.

MAURY T

CLASSIFICATION: FINE, MIXED, MESIC TYPIC **PALEUDULT**

S 80KY-067 -001 SAMPLE NOS. 81P 772 - 778 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	TOTAL FINE .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C -1	SAND VC -2	COARSE FRACTIONS(MM) 2 -5	5 -20	20 -.1- 75	>2MM PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->			
81 772	1S	0- 28	AP	22.5	76.7	0.8			51.7	19.0	0.5	0.7	1.7	2.4	1.5	2	TR	--	8	2
81 773	2S	28- 46	B21T	35.1	58.1	6.8			41.3	16.8	0.3	0.7	1.4	2.8	1.6	2	TR	--	8	2
81 774	3S	46- 61	B22T	38.5	52.7	8.8			36.1	14.6	0.4	0.6	1.5	3.8	2.5	2	TR	--	10	2
81 775	4S	61- 76	B23T	41.5	49.4	9.1			30.1	13.3	0.4	0.9	1.8	4.0	2.0	2	TR	--	11	2
81 776	5S	76- 91	B24T	43.8	45.9	10.3			33.2	12.7	0.4	0.8	1.9	4.0	3.4	2	TR	--	12	2
81 777	6S	99-119	B25T	42.3	47.0	10.7			36.1	10.9	0.4	0.7	1.7	4.3	3.6	2	TR	--	12	2
81 778	7S	127-152	B26T	43.7	40.7	13.6			32.8	7.9	0.7	1.1	1.9	5.5	4.4	2	TR	--	15	2

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	TOTAL S 6H3A	DITH-CIT EXTRACTABLE FE 6G2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8C1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A5A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 772	1	1.42	0.157						0.56	0.42			1.49	1.49	--	17.6			23.2	9.4	0.20
81 773	2	0.38	0.076						0.43	0.40			1.52	1.66	0.069	19.1	22.6		22.1	14.0	0.07
81 774	3	0.33	0.074						0.43	0.41			1.51	1.69	0.038	20.1	24.8		24.2	15.6	0.13
81 775	4	0.25							0.42	0.40			1.47	1.68	0.037	20.7	26.8		25.3	16.4	0.13
81 776	5	0.22							0.39	0.37			1.46	1.63	0.031	20.2			23.7	16.3	0.11
81 777	6	0.18							0.41	0.41			1.53	1.71	0.037	21.4			23.8	17.4	0.10
81 778	7	0.13							0.46	0.42			1.46	1.60	0.031	23.1			24.0	19.0	0.07

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS	CEC NH4- OAC	BASES + AL	BASE SAT SUM	BASE SAT NH4 OAC	CO3 AS CACO3 <2MM 5C1	RES. GMMS /CM 6E1G	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->					1:2	1:1
81 772	1	10.7	0.8	TR	0.3	11.8	4.7		16.5	12.6		72	94				6.2	6.5
81 773	2	9.7	1.1	TR	0.3	11.1	7.9		19.0	15.0		58	74				5.5	6.1
81 774	3	8.8	1.3	TR	0.3	10.4	9.6	0.3	20.0	16.4	10.7	52	63				5.0	5.5
81 775	4	7.5	1.4	TR	0.3	9.2	12.4	1.6	21.6	17.4	10.8	43	53				4.5	5.0
81 776	5	5.8	1.3	--	0.3	7.4	14.1	2.7	21.5	17.1	10.1	34	43				4.2	4.8
81 777	6	4.2	1.1	TR	0.3	5.6	16.1	3.9	21.7	17.3	9.5	26	32				4.0	4.7
81 778	7	4.1	1.3	0.1	0.3	5.8	16.8	4.2	22.6	18.2	10.0	26	32				4.0	4.6

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	7A3	7A3	TOT ANL 7C3 CLAY DTA <2U K20 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 772	1	KK 3	VR 2	MI 2	MT 1	KK28		1.7	7.5
81 773	2								
81 774	3	KK 3	VR 2	MI 1	MT 1	KK32		1.6	7.7
81 775	4								
81 776	5								
81 777	6	KK 3	VR 2	MI 2		KK39		1.9	8.1
81 778	7								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL KK KAOLINITE VR VERMICULITE MI MICA MT MONTMORILL

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Maury taxadjunct1/.

Pedon Number: S80KY-067-1

Classification: Fine, mixed, mesic Typic **Paleudults**.

Location: Fayette County, Kentucky: 2 miles NW on US Highway 421 from its intersection with US Loop 25 and 421 then 120 meters SW in cultivated field on University of Kentucky Experimental Farm. Plot II-3 of Ron Phillip's tillage plots.

Use and Vegetation: Cropland - site has been in conventional till corn for 10 years.

Parent Material: Limestone residuum.

Region: Kentucky Bluegrass - MLRA 121.

Position: Upland - convex ridgetop.

Elevation: ----------

Drainage and Permeability: Well-drained, slowly permeable.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 11-21-80

Ap -- 0 to 28 cm.; dark yellowish brown (10YR3/4) heavy silt loam; moderate fine and medium subangular blocky structure; very hard, friable; many fine and medium roots; common pockets of organic residue; slightly acid; abrupt smooth boundary. (810772).

B21t -- 28 to 46 cm.; strong brown (7.5YR4/6) silty clay loam; moderate fine and medium subangular blocky structure; extremely hard, firm; common fine and very fine roots; few fine and medium pores; few fine (<1mm) Fe-Mn concretions; thin continuous clay films on faces of peds; slightly acid; clear smooth boundary. (810773).

B22t -- 46 to 91 cm.; yellowish red (5YR4/6) silty clay; moderate fine and medium subangular blocky structure; extremely hard, very firm; few fine and very fine roots; few fine and medium pores; common fine (<1mm) Fe-Mn concretions; thin continuous clay films on faces of peds; very strongly acid; gradual wavy boundary. (810774, 775, 776).

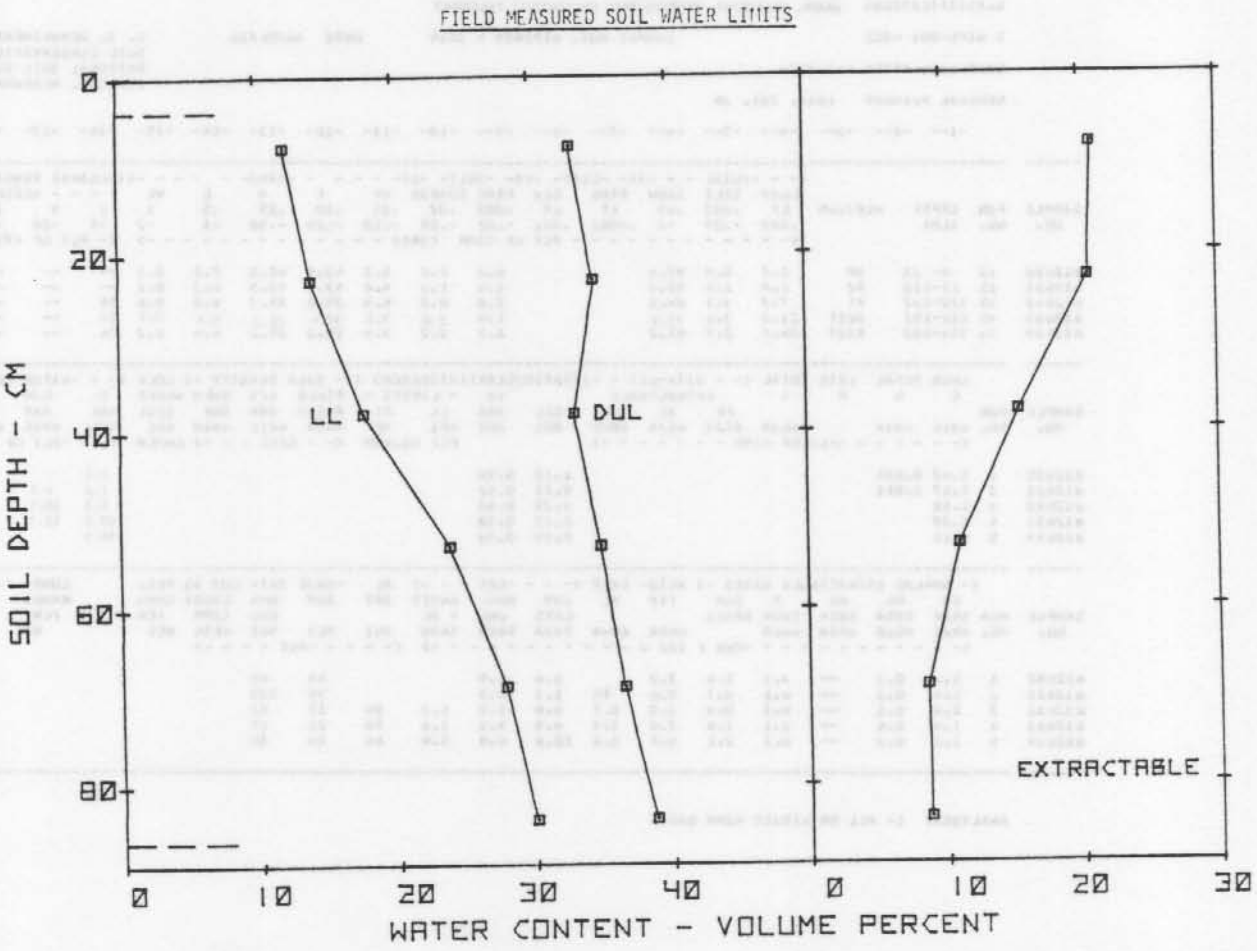
B23t -- 91 to 127 cm.; yellowish red (5YR4/6) silty clay; moderate fine and medium subangular blocky structure; extremely hard, firm; few fine and medium pores; many fine (<1mm) Fe-Mn concretions; thin continuous clay films on faces of peds; very strongly acid; gradual wavy boundary. (810777).

B24t -- 127 to 152 cm.; yellowish red (5YR4/6) silty clay; weak fine and medium subangular blocky structure; very hard, firm; few fine and medium pores; many fine Fe-Mn concretions; thin patchy clay films on faces of peds; few silica or highly weathered chert fragments; few fine distinct yellowish brown and pale yellow mottles; very strongly acid (810778).

Remarks: Colors are for moist soil. Base saturation of lower Bt horizon is 9 percent less than allowed for Alfisols.

Field Measured Soil Water Data Contributed By: G. W. Thomas and R. E. Phillips, Department of Agronomy, University of Kentucky.

Pedon Number: S80KY-067-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	12.1	33.0	20.9
23	14.0	34.6	20.6
38	17.7	33.1	15.4
53	23.9	34.9	11.0
69	27.9	36.5	8.6
84	30.0	38.7	8.7

TOTAL WATER EXTRACTED FROM PROFILE = 13.0 Cm.

MILLHOPPER

CLASSIFICATION: LOAMY, SILICEOUS, HYPERTHERMIC GROSSARENIC PALEUDULT

S 81FL-001 -002 SAMPLE NOS. 81P2630 - 2634 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	TOTAL FINE LT .0002	CLAY CCS LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGMENTS(MM) WEIGHT 2-5	5-20	20-75	>2MM WT .1- 75	PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
812630	1S	0- 23	AP	1.7	0.9	97.4			0.8	0.2	5.2	43.9	40.8	7.2	0.3	--	--	--	92	--
812631	2S	23-112	A2	2.4	2.6	95.0			1.6	1.0	4.6	43.5	40.5	6.3	0.1	--	--	--	90	--
812632	3S	112-122	B1	7.7	3.1	89.2			2.8	0.3	4.8	39.3	35.7	8.8	0.6	TR	--	--	84	--
812633	4S	122-152	B21T	22.5	3.6	73.9			1.6	2.0	5.5	37.4	26.3	4.4	0.3	TR	--	--	74	--
812634	5S	152-183	B22T	36.1	2.7	61.2			2.5	0.2	3.4	26.0	27.2	4.4	0.2	TR	--	--	58	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6A3A	EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC BAR 8D1	15 BAR 8D1	RATIO/CLAY LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1C	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4G2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
812630	1	0.67	0.034						1.12	0.76							2.1			1.3	
812631	2	0.17	0.011						0.21	0.42							1.2	4.4		1.0	
812632	3	0.18							0.25	0.43							4.2	10.5		3.3	
812633	4	0.20							0.23	0.38							10.2	19.3		8.5	
812634	5	0.15							0.14	0.36							16.3			13.7	

SAMPLE NO.	HZN NO.	NH4LAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6D2D	NA 5B5A 6P2B	K 5B5A 6W2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- UAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CACO3 <2MM 6E1G	RES. GMMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 1:2 8C1F 1:1
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->											<- - - - -PCT - - - ->						
812630	1	1.0	0.3	--	0.3	1.6	2.0		3.6	1.9			44	84				5.1	5.8
812631	2	0.4	0.2	--	0.1	0.7	0.0	TR	1.3	0.5			54	100				5.1	5.5
812632	3	0.4	0.1	--	0.1	0.6	3.0	0.7	3.6	1.9	1.3	54	17	32				4.3	4.9
812633	4	1.4	0.4	--	0.1	1.9	7.0	1.9	8.5	5.1	3.6	50	21	37				4.2	4.6
812634	5	1.2	0.6	--	0.1	2.1	8.7	3.6	10.8	6.9	5.9	64	19	30				4.3	4.6

ANALYSES: S= ALL ON SIEVED <2MM BASIS

Series: Millhopper.

Pedon Number: S81FL-001-2

Classification: Loamy, siliceous, hyperthermic Grossarenic Paleudults.

Location: Alachua County, Florida: NE 1/4, SW 1/4, Sec. 12, R.19E., T.10S. Site in in the center of Plot III-1, Unit III of L. C. Hammond's irrigation study on the University of Florida's Irrigation Experimental Farm in Gainesville.

Use and Vegetation: Cropland - presently in corn - previously cropped to peanuts.

Parent Material: Sandy marine sediments of the lower Coastal Plain.

Region: South Central Florida Ridge - MLRA 154.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Moderately well drained. Rapidly permeable in the sandy epipedon - moderate to moderately slow permeability below.

Water Table and Duration: Perched at about 120 cm. following rains.

Slope: Less than 1 percent on a low ridgetop.

Sampled and Described By: Larry F. Ratliff Date: 5-8-81

Ap -- 0 to 23 cm.; very dark grayish brown (10YR3/2) sand; single grain; very friable, loose; many fine and medium roots; medium acid; clear smooth boundary. (812630).

A2 -- 23 to 112 cm.; brownish yellow (10YR6/6) sand; single grain; very friable, loose; common fine and medium roots; common pockets and lenses of uncoated sand; strongly acid; clear wavy boundary. (812631).

B1 -- 112 to 122 cm.; light yellowish brown (10YR6/4) loamy sand; weak fine subangular blocky structure; friable, slightly hard, common fine and medium roots; few fine pores; sand grains coated and bridged with clay, few thin and patchy clay films; about 3 to 5 percent by volume of reddish brown and yellowish red nodules of plinthite; very strongly acid; clear wavy boundary. (812632).

B21t -- 122 to 152 cm.; pale brown (10YR6/3) and light brownish gray (10YR6/2) light sandy clay loam; many medium and coarse prominant reddish yellow (7.5YR6/6,6/8) mottles some of which have firm centers; weak coarse platy parting to weak fine and medium subangular blocky structure; very hard, firm and somewhat brittle in place; common fine and medium roots; few fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary. (812633).

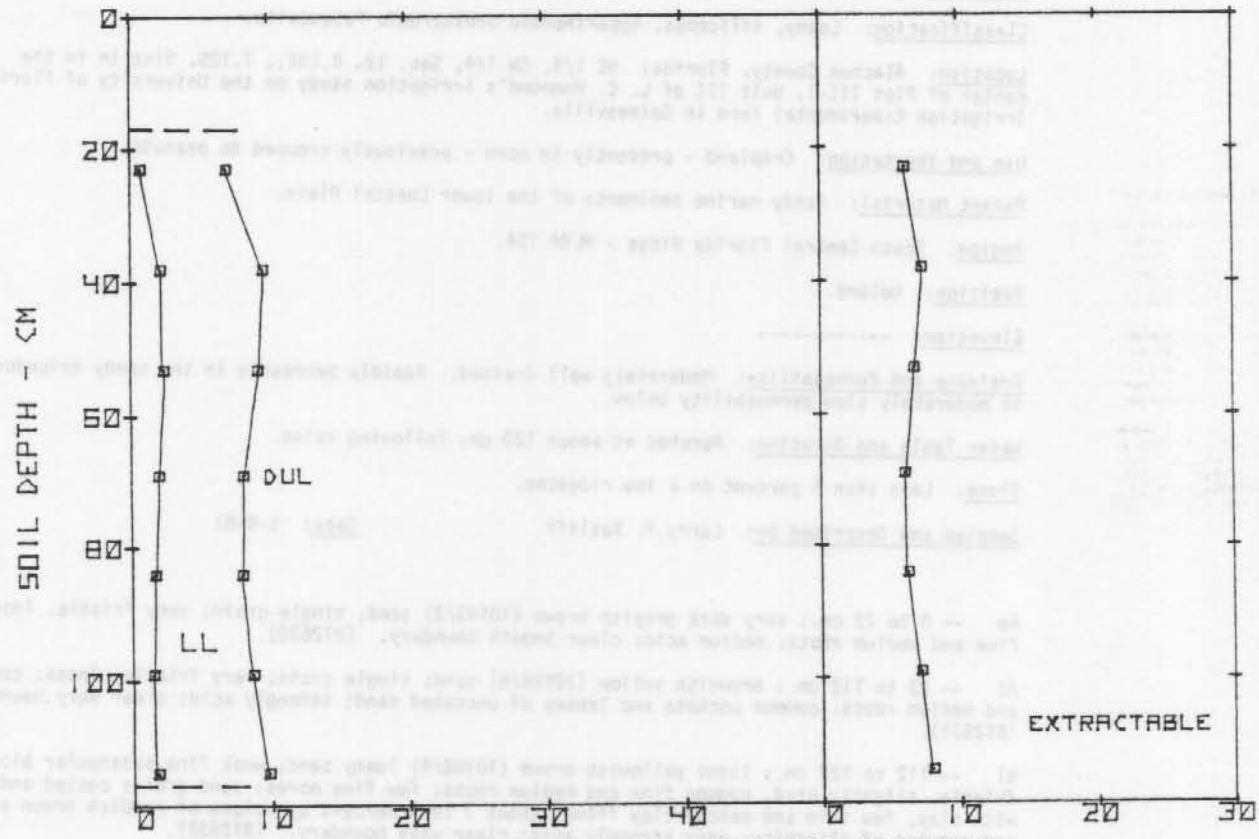
B22t -- 152 to 183 cm.; light gray (10YR7/2) sandy clay; many medium and coarse prominant strong brown (7.5YR5/8) and reddish yellow (7.5YR6/8) mottles, some of which have firm centers; moderate medium subangular blocky structure; few fine roots; few fine and medium pores; few very fine soft masses of Fe-Mn; thin patchy clay films on faces of peds; very strongly acid. (812634).

Remarks: Colors are for moist soil. Soil differs from Millhopper by having slightly more clayey lower Bt horizons. Pedon is borderline to Plinthic subgroup.

Field Measured Soil Water Data Contributed By: L. C. Hammond, Soil Science Department, University of Florida.

Pedon Number: S81FL-001-2

FIELD MEASURED SOIL WATER LIMITS



MILLHOPPER 5-ALACHUA CO./FL.-PEANUTS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
23	0.8	7.0	6.2
38	2.2	9.6	7.4
53	2.4	9.2	6.8
69	2.0	8.1	6.1
84	1.7	8.0	6.3
99	1.5	8.7	7.2
114	1.8	9.8	8.0

TOTAL WATER EXTRACTED FROM PROFILE = 8.2 Cm.

PILLEPPER

CLASSIFICATION: LOAMY, SILICEOUS, HYPERTHERMIC GROSSARENIC PALEUDULT

S 81FL-001 -CGJ SAMPLE NOS. 81P2635 - 2639 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	TOTAL FINE .0002 LT	CLAY CO3 FINE LT .002	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	75	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->											<- PCT OF <75MM(3B1)->				
812635	1S	0- 23	AP	0.4	3.5	96.1				1.6	1.9	6.6	53.1	32.3	4.1	TR	TR	--	--	89	--
812636	2S	23-132	A21	1.2	3.6	95.2				2.4	1.2	6.9	52.0	31.8	4.3	0.2	TR	--	--	88	--
812637	3S	132-163	A22	2.0	3.2	94.8				1.2	2.0	7.0	52.3	30.4	5.0	0.1	TR	--	--	88	--
812638	4S	163-193	B21T	12.6	3.8	83.6				1.6	2.2	6.2	41.8	30.3	5.2	0.1	TR	TR	1	78	1
812639	5S	193-244	B22T	44.6	3.3	52.1				1.7	1.6	4.1	25.4	19.6	2.7	0.3	TR	--	--	48	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B3A	EXTR TOTAL P	EXTR TOTAL S	EXTRACTABLE FE	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8D1	CLAY BAR 8D1	RATIO/CLAY 15 BAR 4F1	ATTERBERG - LIMITS - LL	ATTERBERG - PI 4F	BULK DENSITY - FIELD MOIST 6A3A	BULK DENSITY - 1/3 BAR 6A1D	BULK DENSITY - OVEN DRY 6A1H	COLE WHOLE SOIL 4D1	WATER CONTENT - 2-.06 BAR 4B1A	WATER CONTENT - .06 BAR 4B1C	WATER CONTENT - 1/3 BAR 4B1C	WATER CONTENT - 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - - ->									PCT <0.4MM			<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
812635	1	0.55	0.026						4.50	3.50				1.77	1.77	--	1.8		4.8	1.4	0.06	
812636	2	0.19	0.010						0.42	0.67				1.60			1.3			0.8		
812637	3	0.13							0.20	0.35				1.80			1.2			0.7		
812638	4	0.15							0.25	0.40				1.76	1.80	0.007	6.3	17.3	11.3	5.1	0.11	
812639	5	0.16							0.19	0.35				1.55	1.66	0.023	19.8		21.6	15.5	0.09	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6A2D	NA 5B5A 6A2B	K 5B5A 6A2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. GHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F 1:2 1:1
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->							
812635	1	1.3	0.2	--	0.1	1.6	1.6		3.2	1.8		50	89					5.4	6.2
812636	2	0.1	TR	--	TR	0.1	0.9	0.2	1.0	0.5	0.3	67	10	20				4.8	5.2
812637	3	0.2	TR	--	TR	0.2	0.4	0.1	0.6	0.4	0.3	33	33	50				4.6	4.9
812638	4	0.7	0.3	--	0.2	1.2	4.1	0.7	5.3	3.2	1.9	37	23	37				4.3	4.8
812639	5	0.7	0.7	--	0.1	1.5	9.9	4.1	11.4	8.5	5.6	73	13	14				4.2	4.3

ESTIMATED BULK DENSITY FOR LAYER 2, 3,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

Series: Millhopper.

Pedon Number: S81FL-001-3

Classification: Loamy, siliceous, hyperthermic Grossarenic Paleudults.

Location: Alachua County, Florida: NE 1/4, SW 1/4, Sec. 12, R.19E., T.10S. Site is in the center of Plot II-1, Unit II of L. C. Hammond's Irrigation Study on the University of Florida's Irrigation Experimental Farm in Gainesville.

Use and Vegetation: Cropland - presently in winter wheat.

Parent Material: Sandy marine sediments of the lower Coastal Plain.

Region: South Central Florida Ridge - MLRA 154.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Moderately well drained. Rapidly permeable in the sandy epipedon - moderate to moderately slow below.

Water Table and Duration: Perched at about 160 cm. following rains.

Slope: About 1.5 percent on an east facing slightly convex sideslope.

Sampled and Described By: Larry F. Ratliff Date: 5-8-81

Ap -- 0 to 23 cm.; very dark grayish brown (10YR3/2) fine sand; single grain; very friable, loose; many fine and medium roots in the upper 10 cm.; common roots below; slightly acid; abrupt smooth boundary. (812635).

A21 -- 23 to 132 cm.; light yellowish brown (10YR6/4) fine sand; single grain; very friable, loose; few fine roots; few very fine soft black masses of Fe-Mn; few fine faint yellowish brown mottles; few lenses of uncoated sand-percentage increases with depth; strongly acid; gradual wavy boundary. (812636).

A22 -- 132 to 163 cm.; light yellowish brown (10YR6/4) fine sand; single grain; very friable, loose; few fine roots; few fine (<2 mm) yellowish brown lamella; common pockets and lenses of uncoated sand; very strongly acid; gradual wavy boundary. (812637).

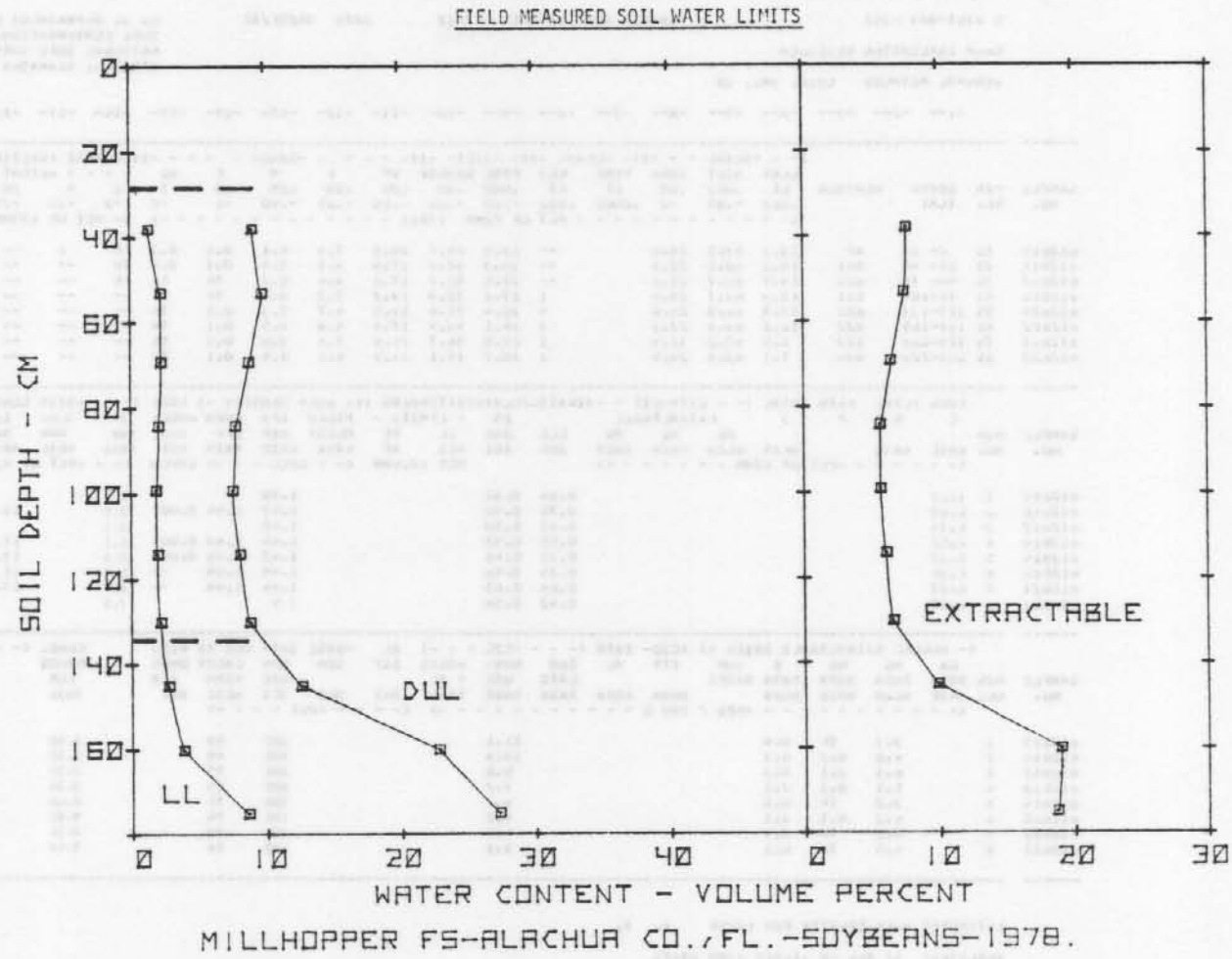
B21t -- 163 to 193 cm.; mottled strong brown (7.5YR5/6) light brownish gray (10YR6/2) and pale brown (10YR6/3) loamy sand; estimated 3 to 5 percent by volume of yellowish red plinthite nodules mostly at upper boundary; friable, slightly hard; slightly brittle in place; few soft masses of Fe-Mn; thin patchy clay films on faces of peds; very strongly acid, clear wavy boundary. (812638).

B22t -- 193 to 244 cm.; light brownish gray (10YR6/2) and light gray (10YR7/2) sandy clay; common medium and coarse prominant strong brown (7.5YR5/6,5/8) mottles; few medium prominant yellowish red (5YR5/8) mottles that have firm centers; moderate fine and medium subangular blocky structure; very hard, very firm; thick patchy clay films on faces of peds; extremely acid. (812639).

Remarks: Colors are for moist soil. Clay content in B21t horizon gradually increases with depth.

Field Measured Soil Water Data Contributed By: L. C. Hammond, Soil Science Department, University of Florida.

Pedon Number: S81FL-001-3



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
38	1.4	9.1	7.7
53	2.3	9.8	7.5
69	2.3	8.8	6.5
84	2.1	7.8	5.7
99	1.9	7.6	5.7
114	2.0	8.1	6.1
130	2.2	8.8	6.6
145	2.7	12.6	9.9
160	3.8	22.8	19.0
175	8.6	27.3	18.7

TOTAL WATER EXTRACTED FROM PROFILE = 16.5 Cm.

MILLVILLE T

CLASSIFICATION: COARSE-SILTY, CARBONATIC, MESIC TYPIC HAPLOXEROLL

S 81CI-005 -001 SAMPLE NOS. 81P2815 - 2822 DATE 06/28/82

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	-1- Total Clay LT .002	-2- Total Silt .002-.05	-3- Total Sand .05-2	-4- Clay Fine LT .0002	-5- Clay CO3 LT .002	-6- Silt Fine .002-.02	-7- Silt Coarse .02-.05	-8- Sand VF .05-.10	-9- Sand F .10-.25	-10- Sand M .25-.50	-11- Sand C .5-1	-12- Sand VC 1-2	-13- Coarse fractions (MM) weight 2-5	-14- 5-20	-15- 20-75	-16- .1-75	-17- (>2MM) WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM(3B1)			->	
812815	1S	0- 22	AP	13.2	57.2	29.6		--	28.5	28.7	20.3	7.4	1.1	0.5	0.3	TR	1	--	10	1
812816	2S	22- 46	B21	15.2	62.5	22.3		--	30.3	32.2	17.6	4.1	0.4	0.1	0.1	TR	--	--	5	--
812817	3S	46- 76	B21	14.7	63.7	21.6		--	31.5	32.2	17.6	3.6	0.2	TR	TR	TR	--	--	4	--
812818	4S	76-107	B21	13.9	60.7	25.4		1	27.8	32.9	19.7	5.3	0.4	TR	TR	--	--	--	6	--
812819	5S	107-137	B22	13.4	62.0	24.6		4	30.4	31.6	19.5	4.7	0.3	0.1	TR	--	--	--	5	--
812820	6S	137-165	B22	12.2	64.5	23.3		4	34.1	30.4	17.9	4.8	0.5	0.1	TR	--	--	--	5	--
812821	7S	165-203	B23	6.9	60.2	32.9		1	25.5	34.7	24.9	7.4	0.5	0.1	TR	--	--	--	8	--
812822	8S	203-224	B24	7.3	63.8	28.9		1	28.7	35.1	23.3	5.1	0.4	0.1	TR	--	--	--	6	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	Dith-Cit Extractable FE 6C2B	AL 6G7A	MN 6D2A	(Ratio/Clay) CEC 8D1	15 BAR 8D1	(Atterberg Limits) LL 4F1	PI 4F	(Bulk Density) Field Moist 4A3A	1/3 BAR 4A1D	Oven Dry 4A1H	COLE Whole Soil 4D1	(Water Content) 2-BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD Whole Soil 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
812815	1	1.23							0.84	0.52			1.30				12.1			6.6	
812816	2	0.89							0.76	0.50			1.42	1.44		0.005	12.8		18.3	7.6	0.15
812817	3	0.74							0.61	0.50			1.40				12.5			7.3	
812818	4	0.52							0.55	0.43			1.45	1.48		0.007	11.1		17.1	6.0	0.16
812819	5	0.37							0.35	0.44			1.42	1.44		0.005	10.9		17.2	5.9	0.16
812820	6	0.31							0.34	0.46			1.45	1.45		--	10.9		17.5	5.6	0.17
812821	7	0.27							0.64	0.65			1.46	1.46		--	8.7		13.9	4.5	0.14
812822	8	0.20							0.42	0.56			1.5				7.5			4.1	

SAMPLE NO.	HZN NO.	(NH4OAC Extractable Bases) CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	(CEC) SUM CATS 5A3A	NH4-OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	(Base Sat) SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	(PH) CACL2 .01M 8C1F 1:2	H2O 8C1F 1:1
		<- MEQ / 100 G									->	<- PCT			->				
812815	1		3.7	TR	0.4					11.1				100	49		0.40	7.8	8.3
812816	2		4.6	0.3	0.3					10.6				100	49		0.35	8.0	8.4
812817	3		6.1	0.1	0.3					9.0				100	55		0.31	8.1	8.4
812818	4		5.1	0.1	0.2					7.7				100	59		0.35	8.1	8.5
812819	5		3.2	TR	0.1					4.7				100	71		0.40	8.2	8.4
812820	6		4.2	0.1	0.1					4.2				100	74		0.85	8.1	8.3
812821	7		4.2	TR	0.1					4.4				100	70		0.54	8.2	8.5
812822	8		4.5	TR	0.1					3.1				100	74		0.48	7.9	8.5

ESTIMATED BULK DENSITY FOR LAYER 1, 3,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

Series: Millville taxadjunct[1/].

Pedon Number: S81UT-005-1.

Classification: Coarse-silty, carbonatic, mesic Typic Haploxerolls.

Location: Cache County, Utah: 75 meters north and 240 meters east of the SW corner of the NW 1/4, Sec. 23, T.12N, R.1E. Site is near Plot #1 of J. Hanks' 1979 Spring Wheat Study on the Greenville Experiment Farm at Logan, Utah.

Use and Vegetation: Cropland - presently in wheat.

Parent Material: Lake alluvium.

Region: Great Salt Lake Area - MLRA 28A.

Position: Upland. Slightly convex bench between mountain foot slope and valley floor.

Elevation: About 1350 meters.

Drainage and Permeability: Well drained, moderate permeability.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 6-15-81

Ap - 0 to 22 cm.; very dark grayish brown (10YR3/2) silt loam; weak fine and medium granular structure; slightly hard, very friable; common fine and very fine roots; few coarse fragments less than 5 mm. in diameter; slight effervescence; moderately alkaline; clear smooth boundary. (812815).

B21 - 22 to 107 cm.; dark brown (10YR4/3) silt loam; weak fine subangular blocky structure; slightly hard, very friable; common fine and very fine roots; many fine pores, few medium and large pores; strong effervescence, moderately alkaline; gradual smooth boundary. (812816, 817, 818).

B22 - 107 to 165 cm.; pale brown (10YR6/3) silt loam; weak fine subangular blocky structure; slightly hard, very friable; common fine roots; common fine pores, few medium pores; few fine faint dark brown stains on faces of peds; few threads of visible CaCO3; violent effervescence, moderately alkaline; gradual smooth boundary. (812819, 820).

B23 - 165 to 203 cm.; brown (10YR5/3) silt loam; weak fine subangular blocky structure; slightly hard, very friable; common fine pores; few threads of visible CaCO3; violent effervescence, strongly alkaline; gradual smooth boundary. (812821).

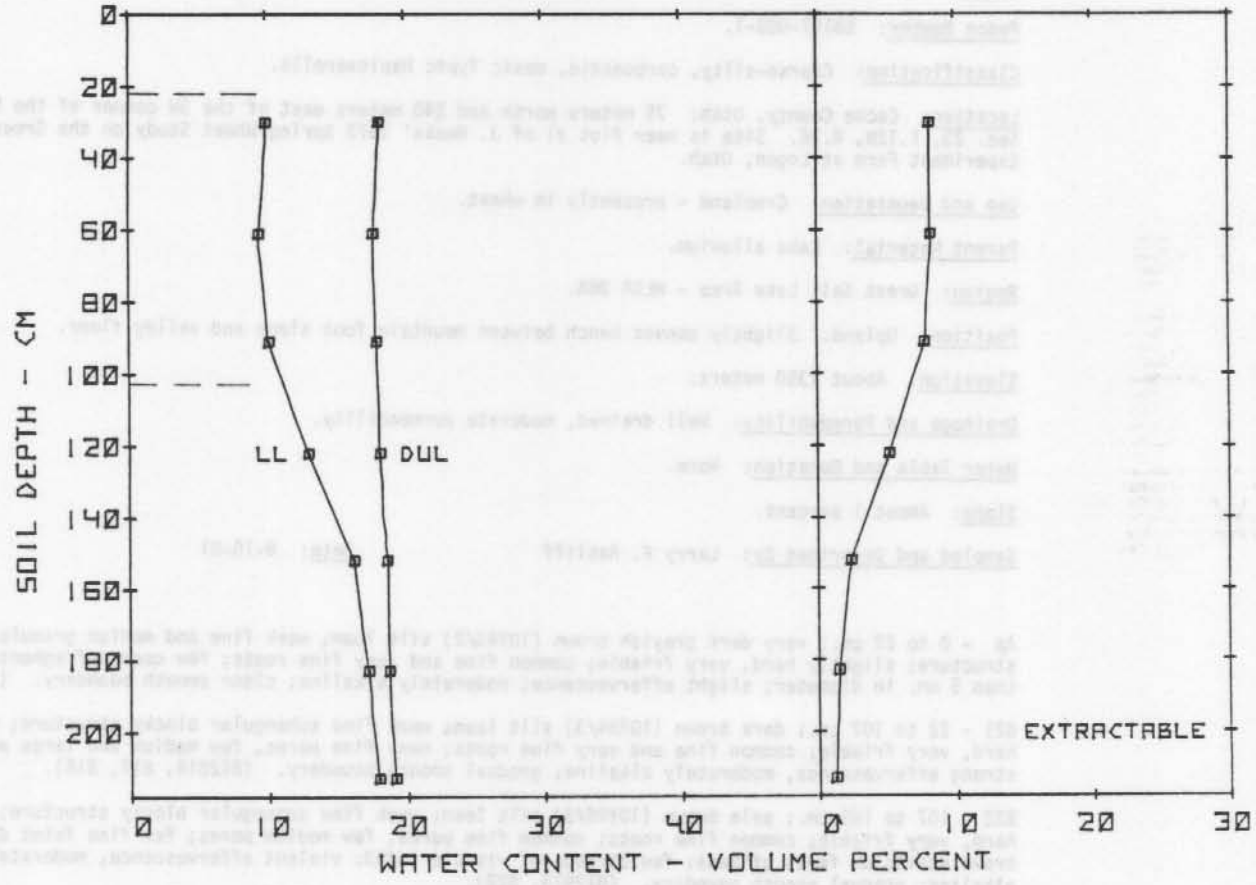
B24 - 203 to 229 cm.; pale brown (10YR6/3) silt loam; weak fine subangular blocky structure; slightly hard, very friable; common fine pores; violent effervescence, strongly alkaline. (812822).

Remarks: [1/]Pedon differs from Millville by having a cambic B horizon and a thinner mollic epipedon than typical for the series. Colors are for moist soil. No cores collected for B24 horizon. Few coarse fragments on surface that are less than 5 cm. in diameter. Average Annual Rainfall about 35 to 40 cm.

Field Measured Soil Water Data Contributed By: R. J. Hanks, Department of Soil Science and Biometeorology, Utah State University.

Pedon Number: S81UT-005-1

FIELD MEASURED SOIL WATER LIMITS



MILLVILLE TAXADJ.-CACHE CO./UT.-S.WHEAT-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	10.0	18.2	8.2
61	9.5	17.8	8.3
91	10.2	18.0	7.8
122	13.0	18.2	5.2
152	16.3	18.7	2.4
183	17.3	18.8	1.5
213	18.0	19.2	1.2

TOTAL WATER EXTRACTED FROM PROFILE = 11.8 Cm.

MINCC

CLASSIFICATION: COARSE-SILTY, MIXED, THERMIC UDIC HAPLUSTOLL

S 80CK-015 -0C1 SAMPLE NOS. 81P 886 - 894 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C -1	SAND VC -2	COARSE FRAGTIONS(MM) WEIGHT -5	-20	-75	>2MM 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 886	1S	0- 15	A1	7.8	44.5	47.7			11.6	32.9	38.1	8.6	0.3	0.5	0.2	--	--	--	10	--
81 887	2S	15- 30	A1	8.2	40.2	51.6			11.5	28.7	40.8	9.4	0.3	0.9	0.2	--	--	--	11	--
81 888	3S	30- 61	B1	9.8	40.9	49.3			11.0	29.9	40.0	8.4	0.2	0.6	0.1	TR	--	--	9	--
81 889	4S	61- 91	B22	10.2	42.6	47.2			11.4	31.2	39.0	7.1	0.1	0.7	0.3	TR	--	--	8	--
81 890	5S	91-122	B22	10.6	45.5	43.9			13.5	32.0	36.8	6.3	0.2	0.4	0.2	TR	--	--	7	--
81 891	6S	122-152	B23	11.0	47.1	41.9			14.3	32.8	35.2	5.8	0.3	0.5	0.1	--	--	--	7	--
81 892	7S	152-183	B23	10.6	48.7	40.7			15.8	32.9	34.3	5.4	0.4	0.4	0.2	TR	--	--	6	--
81 893	8S	183-213	B23	9.3	49.8	40.9			19.1	30.7	35.0	5.1	0.2	0.3	0.3	TR	--	--	6	--
81 894	9S	213-244	B24	11.4	50.0	38.0			16.7	33.9	32.3	4.6	0.5	0.4	0.2	TR	--	--	6	TR

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	S	EXTRACTABLE FE 6E2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6H2A	CEC 8D1	CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 886	1	1.22	0.116						1.13	0.68				1.30			8.0			5.3	
81 887	2	0.93	0.080						1.01	0.59				1.32	1.37	0.012	7.2		10.3	4.8	0.07
81 888	3	0.71	0.064						0.89	0.51				1.30						5.0	
81 889	4	0.49							0.84	0.51				1.40			7.4			5.2	
81 890	5	0.41							0.82	0.51				1.36	1.43	0.012	7.8		11.4	5.4	0.08
81 891	6	0.34							0.79	0.49				1.41	1.47	0.014	9.5	17.4	10.4	5.4	0.07
81 892	7	0.26							0.81	0.50				1.39	1.45	0.014	7.9		11.0	5.3	0.08
81 893	8	0.20							0.87	0.56				1.43	1.51	0.018	8.0		9.7	5.2	0.06
81 894	9	0.16							0.61	0.47				1.40			8.2			5.3	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6Q2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES 6H5A	ACID- ITY 6G9A	EXTR AL	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 <2MM 6E1G	AS CACO3 /CM 8E1	RES. OHMS /CM	COND. MMHOS /CM 8I	PH - CACL2 .01M 8C1F	PH - H2O 1:2 1:1 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->								
81 886	1	6.4	2.2	0.1	0.6	9.3	2.6		11.9	8.8			78	100						6.1	6.5
81 887	2	6.1	1.4	TR	0.3	8.3	2.5		10.8	8.3			77	100						6.1	6.7
81 888	3	5.7	2.6	0.1	0.2	8.6	2.1		10.7	8.7			80	99						6.1	6.9
81 889	4	5.2	3.3	TR	0.2	8.7	0.9		9.6	8.6			91	100						6.3	7.2
81 890	5	4.9	3.6	0.1	0.2	8.8	1.0		9.8	8.7			90	100						6.6	7.5
81 891	6	4.9	4.0	0.1	0.2	9.2	0.4		9.6	8.7			96	100						6.7	7.6
81 892	7	4.8	4.2	0.2	0.2	9.2	0.6		9.8	8.6			94	100						6.8	7.7
81 893	8	4.6	3.6	0.1	0.2	8.7	--		8.7	8.1			100	100						6.7	7.7
81 894	9		3.9	0.1	0.2					6.9						1				7.8	8.4

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - OTA 7A3	MINERALOGY - OTA 7A3	TOT ANL 7C3 CLAY K2O 603A	TOT ANL 7C3 CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 886	1								
81 887	2								
81 888	3	MI 3	MC 2	KK 2		KK 5		2.5	5.9
81 889	4	MI 3	MC 2	KK 2	CL 1	KK 4		2.5	6.2
81 890	5								
81 891	6	MI 3	MC 3	KK 2		KK 8		2.6	6.1
81 892	7								
81 893	8								
81 894	9								

ESTIMATED BULK DENSITY FOR LAYER 1, 3, 4, 9,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MC MONT-CHLOR KK KAOLINITE CL CHLORITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Minco.

Pedon Number: S80OK-015-1

Classification: Coarse-silty, mixed, thermic Udic Haplustolls.

Location: Caddo County, Oklahoma: NE 1/4 of Sec. 22, T.8N., R.9W..

Use and Vegetation: Native rangeland - predominantly little bluestem.

Parent Material: Wind reworked material from sandstone residuum.

Region: Cross Timbers - MLRA 80A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: About 2 percent. Convex sideslope.

Sampled and Described By: Larry F. Ratliff Date: 12-11-80

A1 -- 0 to 30 cm.; reddish brown (5YR4/3) loam, dark reddish brown (5YR3/3) moist; weak fine granular structure; hard, very friable; many fine and medium roots; common fine pores; common wormcasts; few pockets of yellowish red loam; neutral; clear smooth boundary. (810886, 887).

B1 -- 30 to 61 cm.; reddish brown (5YR4/4) loam, dark reddish brown (5YR3/4) moist; weak fine and medium subangular blocky structure; hard, very friable; common fine and medium roots; common fine pores and few medium and coarse pores; few very thin patchy clay films on vertical faces of peds; neutral; gradual smooth boundary. (810888).

B22 -- 61 to 122 cm.; yellowish red (5YR5/6) loam, reddish brown (5YR4/4) moist; weak fine and medium subangular blocky structure; hard, very friable; common fine roots, few medium roots; common fine pores, few medium and coarse pores; thin and patchy clay films on vertical faces of peds; mildly alkaline; gradual smooth boundary. (810889, 890).

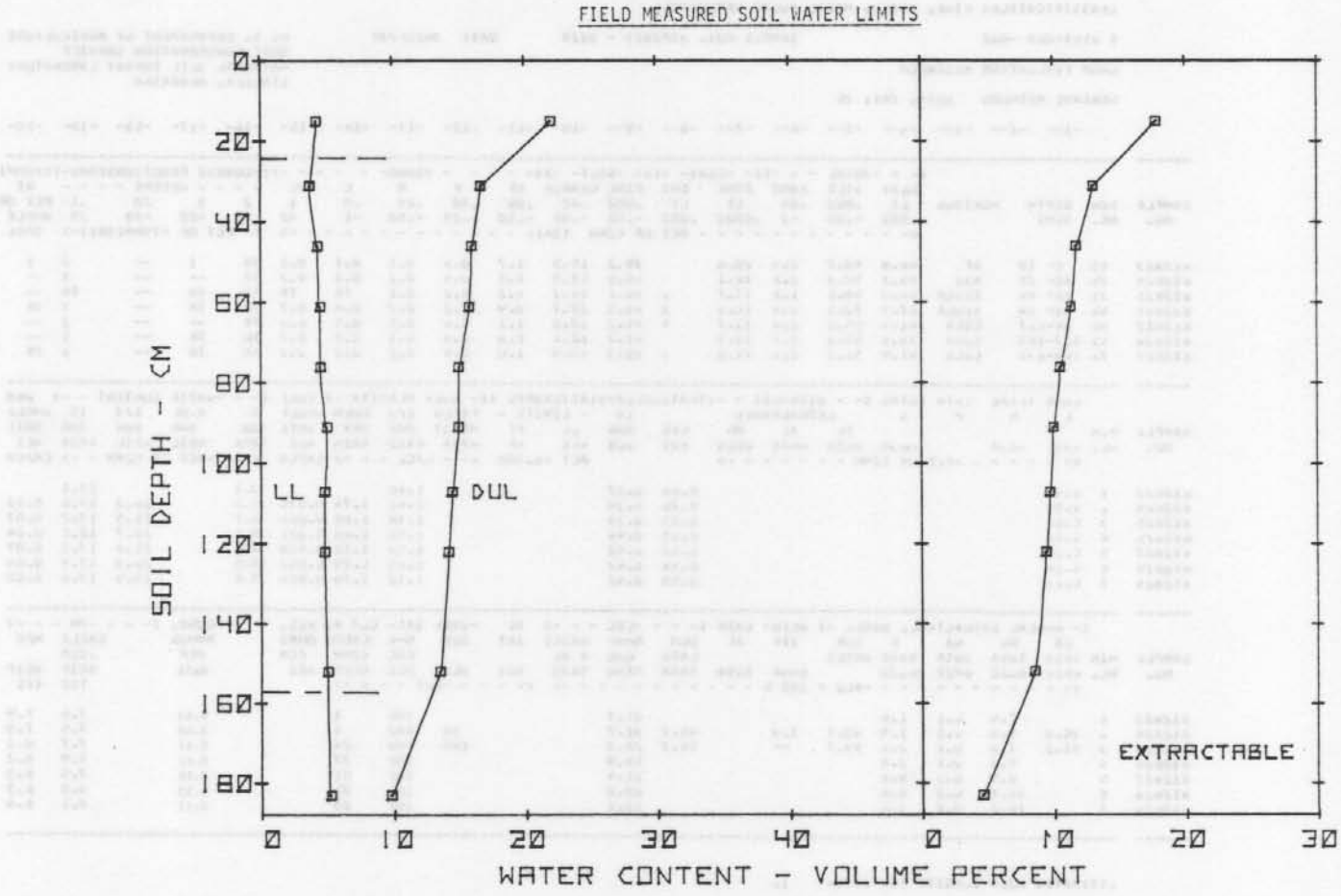
B23 -- 122 to 213 cm.; yellowish red (5YR5/6) loam, yellowish red (5YR4/6) moist; weak fine and medium subangular blocky structure; somewhat compact; very hard, very friable; few fine and medium roots; common fine pores; thin patchy clay films on faces of peds; few small and highly weathered sandstone fragments; mildly alkaline; clear wavy boundary. (810891, 892, 893).

B24 -- 213 to 244 cm.; yellowish red (5YR5/8) silt loam, yellowish red (5YR4/6) moist; weak fine subangular blocky structure; hard, very friable; ocassional very fine roots; few fine and medium pores; few small and highly weathered sandstone fragments; few fine threads of visible $CaCO_3$; strong effervescence, moderately alkaline. (810894).

Remarks: Soil moist to about 45 cm. and very dry below. Site is near Tube 2 of the Lake Chickasha Water Quality Study.

Field Measured Soil Water Data Contributed By: R. G. Menzel and G. A. Coleman, USDA-AR, Southern Plains Watershed and Water Quality Laboratory, Durant and Chickasha, OK.

Pedon Number: S80OK-015-1



MINCO L-CADDO CO.,OK.-RANGELAND-1970.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	4.2	22.0	17.8
31	3.7	16.7	13.0
46	4.3	16.0	11.7
61	4.5	15.8	11.3
76	4.5	15.0	10.5
91	5.0	15.0	10.0
107	4.8	14.5	9.7
122	4.8	14.2	9.4
152	5.0	13.5	8.5
183	5.2	9.8	4.6

TOTAL WATER EXTRACTED FROM PROFILE = 20.3 Cm.

NIBLEY V

CLASSIFICATION: FINE, MIXED, MESIC AQUIC HAPLUSTOLL

S 81LT-065 -062 SAMPLE NOS. 81P2823 - 2829 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .002	CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRAGMENTS(MM) WEIGHT 2 -5	5 -20	20 -75	75 -381	>2MM WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(381)->				
812823	1	0- 10	AP	46.8	50.7	2.5	20.6		39.2	15.5	1.7	0.4	0.1	0.1	0.2	TR	1	--	2	1
812824	2	10- 25	A12	45.1	52.3	2.6	18.1		34.8	17.5	1.7	0.4	0.2	0.1	0.2	TR	--	--	1	--
812825	3	25- 48	B21CA	44.3	54.2	1.5	17.7	2	40.1	14.1	1.2	0.2	0.1	TR	TR	TR	TR	--	TR	--
812826	4	48- 64	B22CA	27.5	70.1	2.4	16.8	3	49.5	20.7	0.9	0.2	0.2	0.4	0.7	TR	TR	--	1	TR
812827	5	64-127	C1CA	41.9	55.2	2.9	11.7	4	45.2	10.0	1.1	0.6	0.5	0.5	0.2	TR	--	--	2	--
812828	6	127-165	C2CA	38.9	59.8	1.7	11.7		47.7	12.1	1.0	0.3	0.1	0.1	0.2	TR	TR	--	1	--
812829	7	165-173	C2CA	41.9	56.2	1.9	12.6	3	45.3	10.9	1.0	0.4	0.2	0.2	0.1	TR	TR	--	1	TR

SAMPLE NO.	HZN NO.	TOTAL C CALC 6A1A	TOTAL N 6B3A	EXTR P	TOTAL S 6A3A	EXTRACTABLE FE 6C2A	AL 6G7A	MN 6D2A	CEC 8D1	CLAY LS 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - - PCT OF <2MM - ->				CM/CM
812823	1	1.30							0.66	0.37				1.40			23.3			17.1	
812824	2	1.55							0.70	0.39				1.42	1.74	0.070	25.3		20.0	17.6	0.12
812825	3	0.68							0.55	0.39				1.56	1.68	0.060	24.1		21.5	17.2	0.07
812826	4	0.36							0.61	0.44				1.58	1.68	0.021	20.1		20.7	12.1	0.14
812827	5	0.26							0.52	0.42				1.59	1.78	0.038	24.0		21.6	17.5	0.07
812828	6	0.24							0.54	0.41				1.63	1.79	0.032	25.0		20.3	17.9	0.04
812829	7	0.23							0.55	0.42				1.52	1.78	0.054	25.8		23.9	17.6	0.10

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B3A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	BASE SAT SUM 5G1	SAT NH4 OAC 5C1	CaCO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F	PH H2O 1:2 8C1F	PH 1:1
		<- - - - - - - - - - - - MEQ / 100 G - - - - - - - - - - - ->										<- - - - PCT - - - ->							
812823	1		7.4	0.1	1.4				31.7				100	1		0.43		7.6	7.9
812824	2	30.0	9.1	0.1	1.5	40.7	1.0		41.7	31.7		98	100	1		0.48		7.5	7.8
812825	3	31.2	7.6	0.1	0.8	39.7	--		39.7	24.3		100	100	24		0.47		7.7	8.1
812826	4		5.6	0.1	0.4					16.9			100	37		0.61		7.9	8.2
812827	5		8.9	0.2	0.6					21.9			100	31		0.49		7.9	8.3
812828	6		11.4	0.2	0.6					28.8			100	31		0.53		8.0	8.3
812829	7		14.2	0.2	0.6					23.1			100	24		0.45		8.1	8.4

ESTIMATED BULK DENSITY FOR LAYER 1,

ANALYSES: S= ALL OR SIEVED <2MM BASIS

Series: Nibley Variant[1/].

Pedon Number: S81UT-005-2

Classification: Fine, mixed, mesic Aquic Haplustolls.

Location: Cache County, Utah: 180 meters north and 15 meters west of the SE corner of the NE 1/4, Sec. 16, T.11N., R.1E. Site is near the center of Plot #115 of J. Hanks' 1978 corn experiment at the Evans Experiment Farm near Logan, Utah.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Lake alluvium.

Region: Great Salt Lake Area - MLRA 28A.

Position: Low Upland. Slightly convex terrace immediately above valley floor.

Elevation: About 1325 meters.

Drainage and Permeability: Moderately well drained and slowly permeable.

Water Table and Duration: None observed.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 6-17-81

Ap - 0 to 10 cm.; very dark gray (10YR3/1) silty clay; moderate fine and medium granular structure; very hard, friable; few very fine roots; moderately alkaline; clear smooth boundary. (812823).

A12 - 10 to 25 cm.; very dark gray (10YR3/1) silty clay; moderate fine subangular blocky structure; very hard, firm; common fine and very fine roots; few fine pores; few wormcasts and channels partially filled with pale brown silty clay loam; mildly alkaline; clear wavy boundary. (812824).

B21ca - 25 to 48 cm.; brown (10YR5/3) silty clay; weak fine and medium angular blocky structure; very hard, firm; common fine roots; few fine and medium pores; few fine faint yellowish brown mottles; about 15 percent of horizon consists of vertically oriented cracks less than 5 mm. wide that are filled with very dark gray silty clay loam; strong effervescence, moderately alkaline; gradual wavy boundary. (812825).

B22ca - 48 to 84 cm.; pale brown (10YR6/3) silty clay loam; weak fine and medium angular blocky structure; very hard, firm; common fine and medium roots and pores; common fine and medium distinct dark yellowish brown (10YR4/4) and yellowish brown (10YR5/6) mottles; few fine faint light brownish gray (10YR6/2) mottles; about 3 to 5 percent by volume of soft masses and fine concretions of $CaCO_3$; violent effervescence, moderately alkaline; gradual wavy boundary. (812826).

C1ca - 84 to 127 cm.; grayish brown (10YR5/2) silty clay; moderate medium angular blocky structure; extremely hard, very firm; few very fine roots between peds; few dark organic stains on faces of peds; common pressure faces; common medium distinct dark yellowish brown (10YR4/4,4/6) mottles; about 15 to 20 percent by volume of white soft masses and fine concretions $CaCO_3$; violent effervescence, moderately alkaline; gradual wavy boundary. (812827).

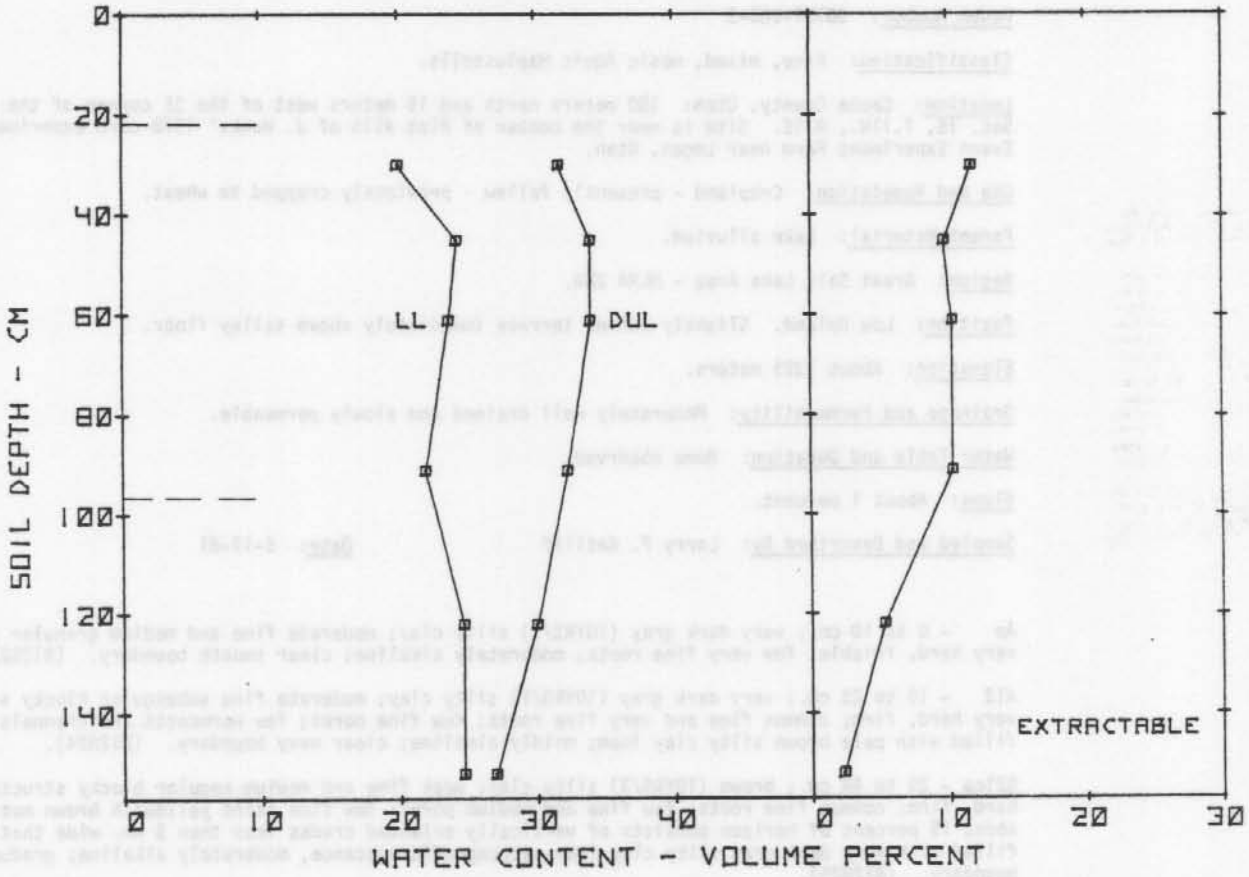
C2ca - 127 to 193 cm.; brown (7.5YR5/2) light silty clay; moderate medium angular blocky structure; extremely hard, very firm; few dark orgatic stains on faces of peds; common pressure faces; common medium distinct dark yellowish brown (10YR4/6) mottles; about 3 to 5 percent by volume white soft masses of $CaCO_3$; violent effervescence, moderately alkaline. (812828, 829).

Remarks: [1/]Laboratory data does not support an argillic horizon. Weighted clay content of control section is 1 percent less than allowed in series. The "structure" described in the C1ca and C2ca horizons is believed to be inherent from the parent material. These horizons are very compact in place.

Field Measured Soil Water Data Contributed By: R. J. Hanks, Department of Soil Science and Biometeorology, Utah State University.

Pedon Number: S81UT-005-2

FIELD MEASURED SOIL WATER LIMITS



NIBLEY VARIANT-CACHE CO./UT.-CORN-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	20.0	31.7	11.7
45	24.3	34.0	9.7
61	23.7	34.0	10.3
91	22.0	32.3	10.3
122	24.7	30.0	5.3
152	24.7	27.0	2.3

TOTAL WATER EXTRACTED FROM PROFILE = 13.7 Cm.

ACKERLK

CLASSIFICATION: FINE-LOAMY, SILICEOUS, THERMIC TYPIC PALEUDULT

S 81NC-101 -001 SAMPLE NOS. 81P4695 - 4700 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.5	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	>2MM .1-75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)												<- PCT OF <75MM(3B1) ->				
814695	1S	0- 23	AP	26.8	11.0	86.2			6.1	4.9	10.4	34.8	29.2	10.9	0.9	TR	--	--	76	TR
814696	2S	23- 43	A2	44.5	12.8	80.7			7.3	5.5	8.7	34.0	27.3	9.9	0.8	TR	--	--	72	--
814697	3S	43- 91	B2LT	54.0	10.7	70.3			6.1	4.6	8.0	26.6	23.2	10.5	2.0	TR	TR	--	62	TR
814698	4S	91-127	B22T	32.1	9.4	58.5			4.9	4.5	6.6	21.2	19.6	9.3	1.8	TR	TR	--	52	TR
814699	5S	127-152	B23T	30.1	9.9	60.0			5.7	4.2	6.8	22.0	19.4	9.2	2.6	TR	--	--	53	TR
814700	6S	152-183	B24T	27.5	9.6	62.8			4.1	5.5	6.0	22.7	21.2	9.9	3.6	TR	TR	--	57	TR

SAMPLE NO.	HZN NO.	ORGN TOTAL C 8A1C	TOTAL N 8B3A	EXTR TOTAL P	TOTAL S	DITH-CIT EXTRACTABLE FE 6C2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6G2A	CEC 8D1	RATIO/CLAY 15 BAR 8U1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->								PCT <0.4MM			<- G/CC - ->			CM/CM	<- - PCT OF <2MM - ->			CM/CM
814695	1	0.62							0.71	0.61				1.68	1.68	--	3.4		5.1	1.7	0.06
814696	2	0.32							0.26	0.38				1.85	1.85	--	4.6		6.4	2.5	0.07
814697	3	0.21							0.17	0.38				1.68	1.70	0.004	9.2		10.1	7.3	0.05
814698	4	0.24							0.15	0.39				1.57	1.62	0.010	14.7		19.6	12.6	0.11
814699	5	0.20							0.15	0.41				1.60	1.64	0.006	15.5		20.7	12.3	0.13
814700	6	TR							0.16	0.44				1.60			14.6			12.1	

SAMPLE NO.	HZN NO.	NH4OAC EXTR BASES CA 5E5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID-ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS	CEC NH4-OAC	BASES + AL	AL SAT SUM	BASE SAT NH4 OAC	CO3 AS CACO3 <2MM	RES. OHMS /CM	COND. MMHOS /CM	PH CACL2 .01M	PH H2O 1:1
		<- MEQ / 100 G ->										<- PCT ->						
814695	1	0.9	0.2	TR	0.2	1.3	2.5		3.8	2.0		34	65				5.2	5.9
814696	2	0.2	0.1	--	0.1	0.4	1.9	0.4	2.3	1.7	0.8	50	17	24			4.5	5.0
814697	3	0.8	0.3	TR	0.2	1.3	3.9	0.6	5.2	3.2	1.9	32	25	41			4.4	4.9
814698	4	1.0	0.3	TR	0.1	1.4	5.9	0.9	7.3	4.7	2.3	39	19	30			4.4	4.7
814699	5	0.5	0.1	--	0.1	0.7	6.4	1.2	7.1	4.5	1.9	63	10	16			4.3	4.5
814700	6	0.4	0.1	0.1	0.1	0.7	5.3	1.2	6.0	4.3	1.9	63	12	16			4.3	4.4

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - DTA - <2U 7A3	MINERALOGY - CLAY - DTA - <2U 7A3	TOT ANL CLAY K2O 6Q3A	TOT ANL CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
814695	1								
814696	2	VR 2	KK 2	GI 2	QZ 1	KK11	GI 8	0.7	6.0
814697	3								
814698	4	KK 3	GI 3	VR 2		KK25	GI21	0.5	7.9
814699	5								
814700	6	KK 3	GI 2	VR 2		KK27	GI13	0.5	7.0

ESTIMATED BULK DENSITY FOR LAYER 6:

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL VR VERMICULITE KK KAOLINITE GI GIBBSITE QZ QUARTZ

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Norfolk.

Pedon Number: S81NC-101-1

Classification: Fine-loamy, siliceous, thermic Typic Paleudults.

Location: Johnston County, North Carolina: 3.2 miles northwest on U.S. Highway 70 from its intersection with State Highway 42 in Clayton then 0.1 mile south and 0.15 mile southeast on field road. Site is 30 meters northeast of field road in the center of Plot 16 of Keith Cassel's 1981 Irrigation Scheduling Study.

Use and Vegetation: Cropland - presently cropped to corn.

Parent Material: Unconsolidated marine sediments.

Region: Southern Coastal Plain - MLRA 133A.

Position: Upland.

Elevation: About 85 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: Perched at 150 cm. when described. Expected to be present for 5 to 10 days following heavy rains.

Slope: 0.5 percent, slightly convex ridgetop.

Sampled and Described By: Larry F. Ratliff Date: 9-15-81

Ap - 0 to 23 cm.; brown (10YR4/3) loamy sand; single grain; hard, very friable; many fine and medium roots in upper 10 cm., common fine and medium roots below; few pockets of partially decomposed organic residue; few streaks of (10YR5/6) loamy sand; medium acid; clear smooth boundary. (814695).

A2 - 23 to 43 cm.; yellowish brown (10YR5/6) heavy loamy sand; single grain; very hard, friable; few fine roots; few pockets of Ap horizon material apparently from subsoiling activities; very strongly acid; clear wavy boundary. (814696).

B21t - 43 to 91 cm.; yellowish brown (10YR5/8) heavy sandy loam; weak fine and medium subangular blocky structure; very hard, firm; few fine roots; few fine and medium pores; sand grains coated and bridged with clay, thin patchy clay films on faces of peds; few pockets of loamy sand; very strongly acid; gradual wavy boundary. (814697).

B22t - 91 to 127 cm.; yellowish brown (10YR5/8) sandy clay loam; common medium and coarse distinct strong brown (7.5YR5/6,5/8) mottles some of which have firm yellowish red centers; weak medium subangular blocky structure; extremely hard, firm; few fine and medium pores; sand grains are coated and bridged with clay, thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary. (814698).

B23t - 127 to 152 cm.; yellowish brown (10YR5/8) sandy clay loam; many medium and coarse prominent red (2.5YR4/6) mottles some of which have firm red centers; few fine faint grayish brown (10YR5/2) mottles; weak medium subangular blocky structure; extremely hard, firm; few fine and medium pores; sand grains coated and bridged with clay; about 3 to 5 percent nodular plinthite; very strongly acid; gradual wavy boundary. (814699).

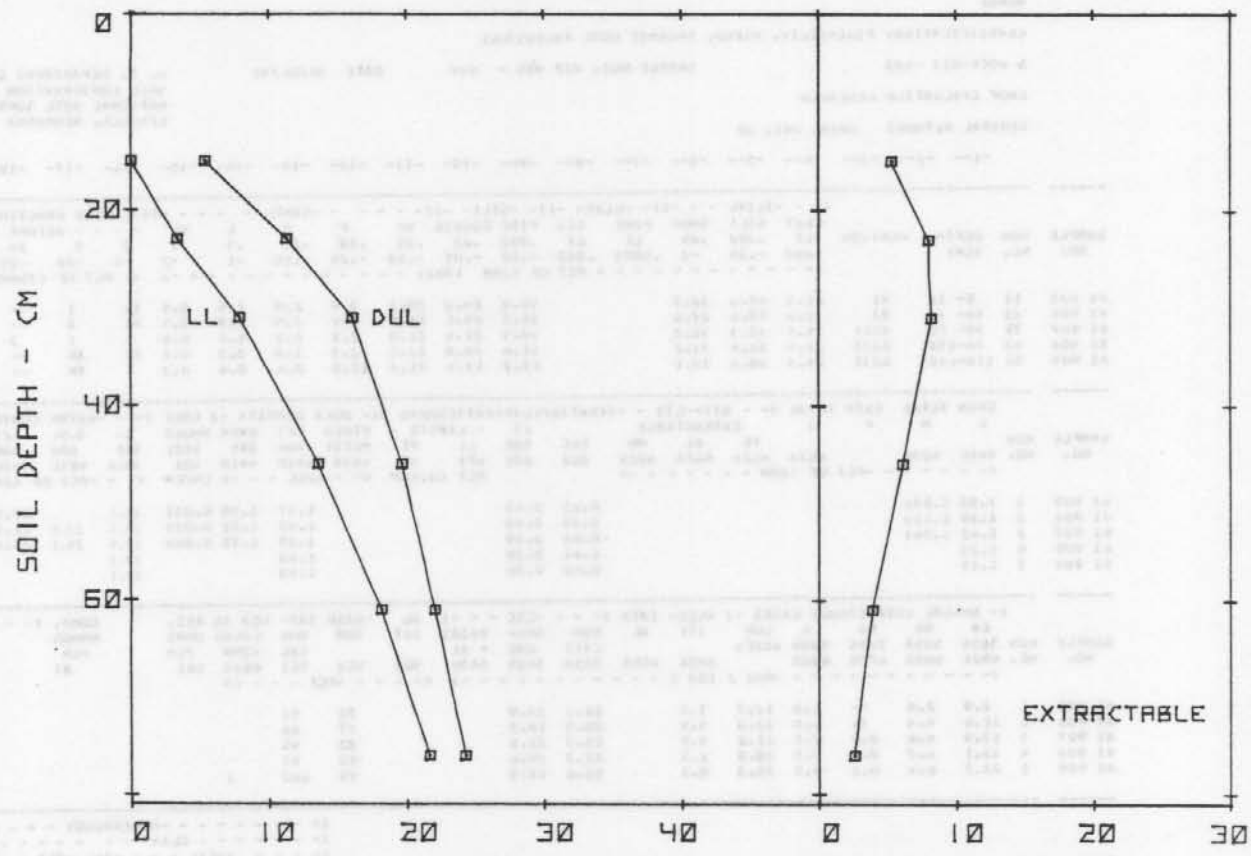
B24t - 152 to 183 cm.; mottled yellowish brown (10YR5/8) red (2.5YR4/6) and light brownish gray (10YR6/2) sandy clay loam; moderate medium platy parting to weak medium subangular blocky structure; extremely hard, firm; few fine and medium pores; sand grains coated and bridged with clay; estimated 5 to 10 percent platy plinthite; extremely acid. (814700).

Remarks: Soil is developing in marine sediments along the "Fall Line" with the Piedmont. Laboratory data not received in time for analysis.

Field Measured Soil Water Data Contributed By: Keith Cassel, Department of Soil Science, North Carolina State University, Raleigh, N.C.

Pedon Number: S81NC-101-1

FIELD MEASURED SOIL WATER LIMITS



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	0.0	5.3	5.3
23	3.3	11.3	8.0
31	7.9	16.1	8.2
46	13.6	19.7	6.1
61	18.2	22.1	3.9
76	21.7	24.3	2.6

TOTAL WATER EXTRACTED FROM PROFILE = 4.5 Cm.

NGRGE

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC UDIC PALEUSTOLL

S 80CK-017 -003 SAMPLE NOS. 81P 905 - 909 DATE 06/28/82

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

-1- -2- -3- -4- -5- -6- -7- -8- -9- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.5	SAND C .5-1	SAND VC 1-2	COARSE FRAGMENTS(MM) WEIGHT 2-5	5-20	20-75	>2MM 75-381	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(381)->				
81 905	1S	0- 18	A1	21.5	45.8	32.7			16.8	29.0	20.1	7.9	2.8	1.4	0.5	TR	1	--	13	1
81 906	2S	18- 38	B1	31.0	40.6	27.6			15.5	25.1	16.9	6.9	2.5	0.9	0.4	TR	1	--	12	1
81 907	3S	38- 76	B21T	35.5	32.3	32.2			10.9	21.4	21.0	7.3	2.1	1.2	0.6	1	1	3	16	5
81 908	4S	76-118	B22T	34.4	32.4	33.2			11.6	20.8	23.5	8.3	1.0	0.3	0.1	TR	TR	--	10	TR
81 909	5S	118-140	B23T	34.3	30.6	35.1			13.2	17.4	21.8	12.0	0.6	0.4	0.3	1	TR	--	14	1

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	EXTR S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6G2A	RATIO/CLAY CEC 15 BAR 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 905	1	1.85	0.152						0.65	0.43				1.37	1.50	0.031	14.1		20.0	9.2	0.15
81 906	2	1.39	0.119						0.58	0.40				1.40	1.52	0.028	18.3	27.8	21.1	12.8	0.12
81 907	3	0.62	0.061						0.64	0.39				1.39	1.70	0.068	19.9	29.1	25.8	14.0	0.16
81 908	4	0.29							0.66	0.38				1.40			19.3			13.2	
81 909	5	0.15							0.55	0.38				1.40			18.1			13.1	

SAMPLE NO.	HZN NO.	AMMOAC EXTRACTABLE BASES CA 5E5A 6N2E	MG 5B5A 6Q2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES 6H5A	ALID- ITY 6G9A	EXTR AL	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 81	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->											<- - - - -PCT - - - ->						
81 905	1	8.9	2.8	--	1.0	12.7	3.5		16.2	13.9			78	91					
81 906	2	10.6	4.4	TR	1.0	16.0	4.9		20.9	18.5			77	86				5.6	6.1
81 907	3	13.9	6.6	0.2	0.5	21.2	4.5		25.7	22.6			82	94				5.7	6.4
81 908	4	13.1	6.2	0.2	0.5	20.0	2.3		22.3	20.6			90	97				5.9	6.7
81 909	5	23.2	6.4	0.2	0.5	30.3	0.3		30.6	18.9			99	100	1			6.3	7.2
																		7.6	8.3

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A3	MINERALOGY CLAY X-RAY <2U 7A3	TOT ANL CLAY K2O 603A	TOT ANL CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 905	1								
81 906	2	MT 3	KK 2	QZ 1		KK15		2.4	5.3
81 907	3								
81 908	4	MT 3	MI 3	KK 2	VR 1	KK16		2.3	5.8
81 909	5								
		MT 3	MT 3	KK 2	VR 1	KK16		3.7	5.9

ESTIMATED BULK DENSITY FOR LAYER 4, 5.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE QZ QUARTZ MT MONTMORILL VR VERMICULITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Norge.

Pedon Number: S80OK-017-3

Classification: Fine-silty, mixed, thermic Udic Paleustolls[1/].

Location: Canadian County, Oklahoma: In the SE 1/4 of Sec. 4, T.12N., R.8W., of the Oklahoma State University Agriculture Experiment Station near El Reno. Site is 1.5 meters north of Tube 3, Watershed 3 of the Water Quality Research Study.

Use and Vegetation: Native rangeland - little bluestem, big bluestem, Indiangrass and sideoats grama.

Parent Material: Assumed to be shaly red beds.

Region: Central Rolling Red Prairies - MLRA 80A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, slow to very slowly p ermeable.

Water Table and Duration: None.

Slope: About 1.5 percent on ridgetop.

Sampled and Described By: Larry F. Ratliff Date: 12-10-80

A1 -- 0 to 18 cm.; dark reddish gray (5YR4/2) loam, dark reddish brown (5YR3/2) moist; weak coarse prismatic parting to weak fine and medium subangular blocky structure; hard, friable; many fine and medium roots; common fine pores; slightly acid; clear smooth boundary. (810905).

B1 -- 18 to 38 cm.; reddish brown (5YR4/3) clay loam, dark reddish brown (5YR3/3) moist; weak coarse prismatic parting to weak fine and medium subangular blocky structure; very hard, friable; many fine roots, few medium roots; common fine pores; thin patchy clay films on faces of peds; few angular and rounded coarse fragments that are less than 10 mm. in diameter; slightly acid; clear wavy boundary. (810906).

B21t -- 38 to 76 cm.; red (2.5YR5/6) clay loam, red (2.5YR4/6) moist; moderate coarse prismatic parting to strong coarse blocky structure; extremely hard, very firm; common fine and very fine (flattened) roots mostly along vertical ped faces; thick continuous clay films on faces of peds that are slightly darker than the matrix color; few coarse fragments up to 3 cm. in diameter; neutral; gradual wavy boundary. (810907).

B22t -- 76 to 118 cm.; red (2.5YR5/8) clay loam, red (2.5YR4/8) moist; moderate coarse prismatic parting to strong coarse blocky structure; extremely hard, very firm; common fine and very fine roots (flattened) mostly along vertical ped faces; thick continuous clay films on faces of peds that are slightly darker than the matrix; an ocassional small coarse fragment; neutral; gradual wavy boundary. (810908).

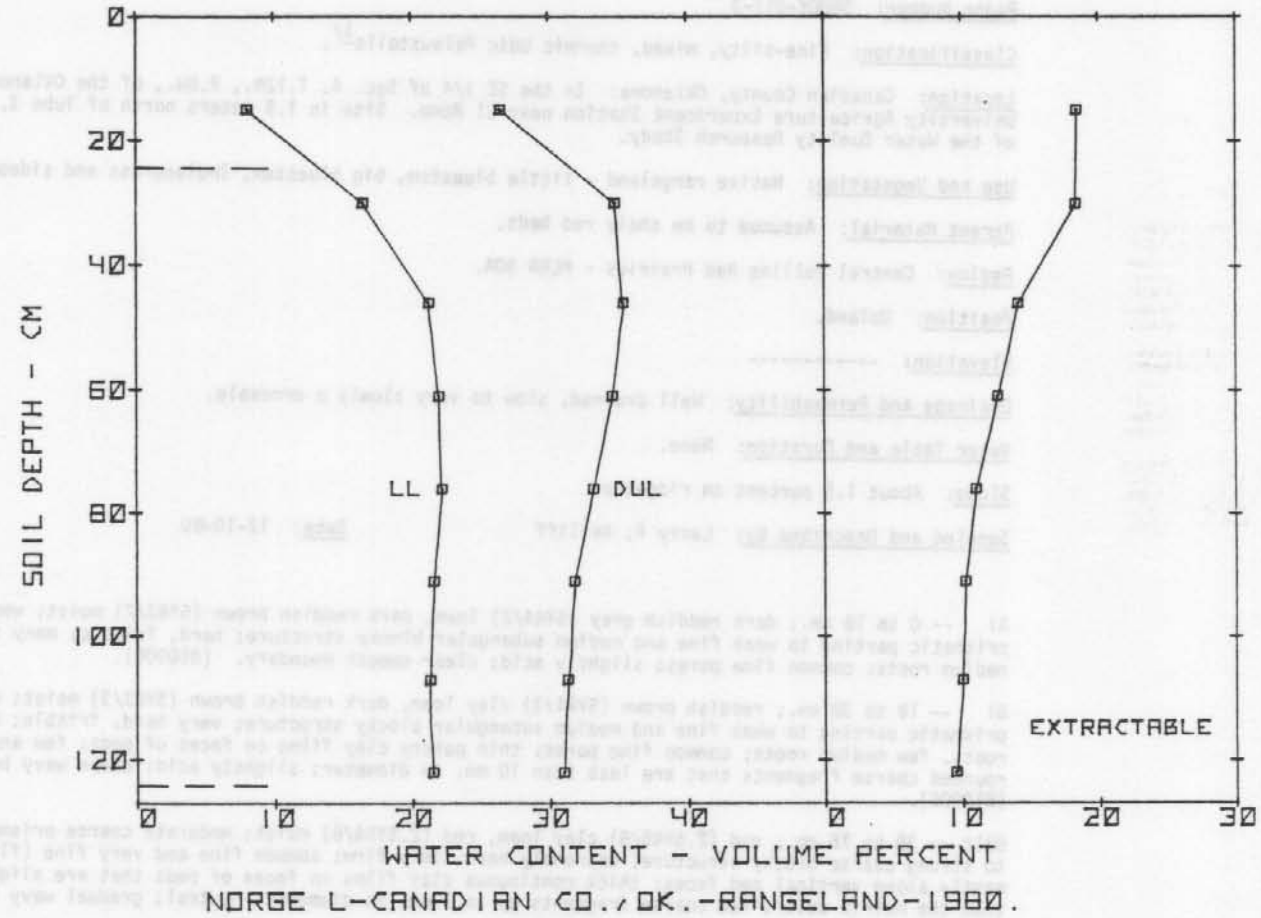
B23t -- 118 to 140 cm.; red (2.5YR5/8) clay loam, red (2.5YR4/8) moist; moderate medium and coarse blocky structure; very hard, firm; common fine roots along vertical ped faces; thick continuous clay films on faces of peds; few coarse fragments mostly less than 1 cm. in diameter; mildly alkaline. (810909).

Remarks: [1/]Textural family is borderline to fine. Soil was moist to about 45 cm. and very dry below. Could obtain only peds from B22t and no cores or peds were obtained from the B23t horizon. Average Annual Rainfall of about 75 cm.

Field Measured Soil Water Data Contributed By: R. G. Menzel and G. A. Coleman, USDA-AR, Southern Plains Watershed and Water Quality Laboratory, Durant and Chickasha, OK.

Pedon Number: S80OK-017-3

FIELD MEASURED SOIL WATER LIMITS



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	8.1	26.5	18.4
30	16.5	34.8	18.3
46	21.3	35.4	14.1
61	22.0	34.6	12.6
76	22.2	33.2	11.0
91	21.6	31.8	10.2
107	21.3	31.3	10.0
122	21.5	31.0	9.5

TOTAL WATER EXTRACTED FROM PROFILE = 17.3 Cm.

NCRKA

CLASSIFICATION: FINE-SILTY, MIXED, MESIC ARIDIC ARGIUSTOLL

S 81CO-121 -001 SAMPLE NOS. 81P3448 - 3454 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SILT VF .05 -.10	SAND VC 1 -2	SAND C .5 -1	SAND M .25 -.50	SAND F .10 -.25	SAND VF .05 -.10	COARSE FRACTIONS(MM) WEIGHT 2 -5	5 -20	20 -75	.1- 75	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->													<- PCT OF <75MM(3B1)->				
813448	1S	0- 13	AP	19.5	44.3	36.2			14.5	29.8	27.1	4.6	2.7	1.3	0.5	1	TR	--	10	1
813449	2S	13- 28	B2T	33.8	41.5	24.7			16.9	24.6	21.0	2.5	0.8	0.3	0.1	TR	--	--	4	--
813450	3S	28- 71	C1CA	20.4	44.1	35.5		1	16.3	27.8	31.8	3.1	0.4	0.1	0.1	TR	--	--	4	--
813451	4S	71-132	C2CA	16.5	49.8	33.7		1	16.1	33.7	30.8	2.2	0.3	0.3	0.1	TR	--	--	3	--
813452	5S	132-191	C2CA	14.4	41.9	43.7		TR	12.3	29.6	36.1	3.8	2.3	1.0	0.5	TR	TR	--	8	TR
813453	6S	191-221	2B21TC	19.3	18.1	62.6		1	7.4	10.7	13.8	16.1	20.6	9.1	3.0	2	TR	--	50	2
813454	7S	221-254	2B22TC	24.4	18.6	57.0		1	8.3	10.3	12.0	12.9	20.4	9.4	2.3	1	TR	--	46	1

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
813448	1	0.81	0.085						0.88	0.53			1.24	1.33	0.024	15.5	35.4	25.7	10.3	0.19	
813449	2	0.56	0.074						0.87	0.50			1.32	1.56	0.057	24.3	30.3	26.7	16.8	0.13	
813450	3	0.53	0.064						0.99	0.61			1.44	1.57	0.029	18.6	28.8	20.9	12.5	0.12	
813451	4	0.20							1.06	0.59			1.32	1.38	0.015	16.1		21.3	9.7	0.15	
813452	5	0.13							1.09	0.54			1.37	1.39	0.005	11.9		17.3	7.8	0.13	
813453	6	0.08							0.99	0.45			1.52	1.74	0.046	12.5		19.5	8.7	0.16	
813454	7	0.08							0.67	0.48			1.46	1.57	0.024	15.8		16.8	11.6	0.08	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	NH4- OAC 5A8B	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- MEQ / 100 G ->											<- PCT ->					1:2	1:1
813448	1	15.3	3.3	0.1	1.7	20.4	0.1		20.5	17.1			100	100	TR			7.3	7.7
813449	2	22.0	7.7	0.3	1.8	31.8	0.7		32.5	29.3			98	100	--			7.4	7.8
813450	3		7.1	0.2	1.5					20.2			100		11			7.8	8.2
813451	4		8.5	1.2	2.4					17.5			100		10			8.0	8.6
813452	5		6.3	1.6	2.0					15.7			100		6			8.1	8.7
813453	6		5.3	1.2	1.5					19.2			100		7			8.1	8.6
813454	7		6.5	1.3	1.8					16.4			100		6			8.1	8.4

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DIA <2U 7A3	7A3	TOT ANL CLAY K2O 603A	Fe 607A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
813448	1								
813449	2	MT 4	MI 3	KK 2		KK16			
813450	3								
813451	4	MT 3	CA 2	MI 1	KK 1				
813452	5								
813453	6	MT 4	MI 3	KK 2	CA 1	KK 9			
813454	7								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Norka.

Pedon Number: S81CO-121-1

Classification: Fine-silty, mixed, mesic Aridic Argiustolls.

Location: Washington County, Colorado: SW 1/4 of Sec. 7, T.2N., R.51W. Soil described and sampled near the center of the "field capacity study" on south end of Plot 2 - Line 4 of Wayne Shawcroft's 1978 Line Source Study at Central Great Plains Research Station.

Use and Vegetation: Cropland - presently in grain sorghum.

Parent Material: Loess over old alluvium.

Region: Central High Plains - MLRA 67.

Position: Upland.

Elevation: About 1100 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-14-81

Ap - 0 to 13 cm.; very dark grayish brown (10YR3/2) loam; massive; hard, very friable; few fine roots; common fine pores; common pockets of partially decomposed organic residue; mildly alkaline; clear smooth boundary. (813448).

B2t - 13 to 28 cm.; dark brown (10YR3.5/2) clay loam; moderate fine subangular blocky structure; very hard, firm; many fine roots between peds; few fine pores; thick continuous clay films on faces of peds; few wormcasts filled with calcareous material; mildly alkaline; gradual wavy boundary. (813449).

C1ca - 28 to 71 cm.; pale brown (10YR6/3) and brown (10YR5/3) loam; few fine faint yellowish brown mottles; massive with a few vertical cleavage planes; slightly hard, very friable; common fine roots; few fine and very fine pores; violent effervescence, moderately alkaline; gradual wavy boundary. (813450).

C2ca - 71 to 191 cm.; pale brown (10YR6/3) and brown (10YR5/3) loam; few fine faint yellowish brown mottles; massive; slightly hard, very friable; few fine roots in upper part; few fine and very fine pores; few fine threads of visible $CaCO_3$; violent effervescence, strongly alkaline; clear wavy boundary. (813451, 452).

IIB21tca - 191 to 221 cm.; reddish brown (5YR5/4) heavy sandy loam; weak medium and coarse subangular blocky structure; hard, friable; common fine and medium pores; thin patchy clay films on faces of peds; few coarse fragments less than 1 cm. in diameter; many fine threads, soft masses and concretions of white $CaCO_3$; violent effervescence, strongly alkaline. (813453).

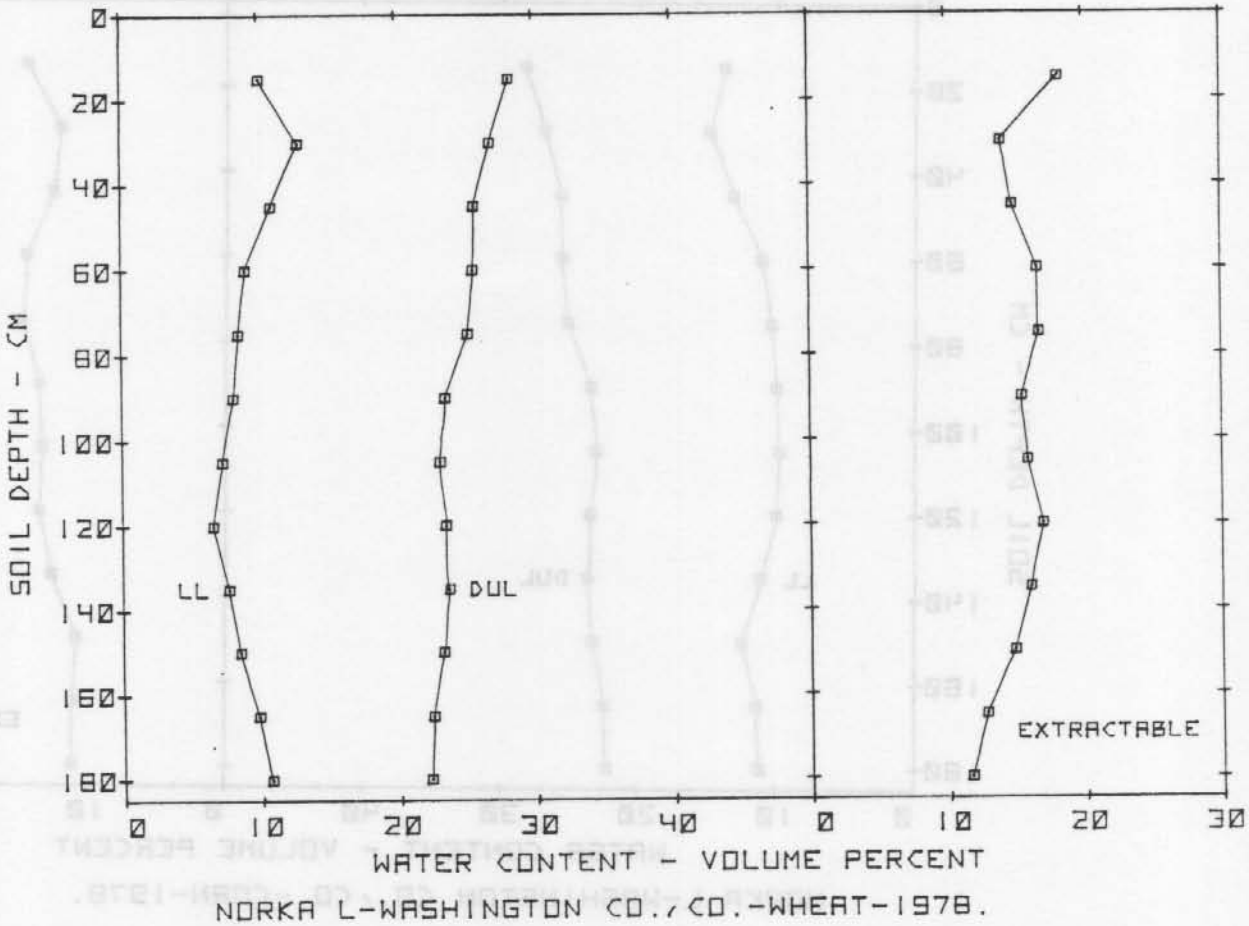
IIB22tca - 221 to 254 cm.; reddish brown (5YR5/4) sandy clay loam; weak medium and coarse subangular blocky structure; hard, friable; common fine and medium pores; thin patchy clay films on faces of peds; few coarse fragments less than 1 cm. in diameter; many fine threads, soft masses and concretions of white $CaCO_3$; violent effervescence, moderately alkaline. (813454).

Remarks: The C horizon is redder than typical for Norka. Several borings were made in plot area - including north and south end of plot 8, line 3 and plot 4, line 6. Soils appeared to be uniform. North end of plot 8 has a thicker, slightly more clayey argillic horizon. Colors are for moist soil. Laboratory data received too late for analysis.

Field Measured Soil Water Data Contributed By: R. W. Shawcroft, USDA-AR, Central Great Plains Research Station, Akron, Colorado.

Pedon Number: S81CO-121-1

FIELD MEASURED SOIL WATER LIMITS



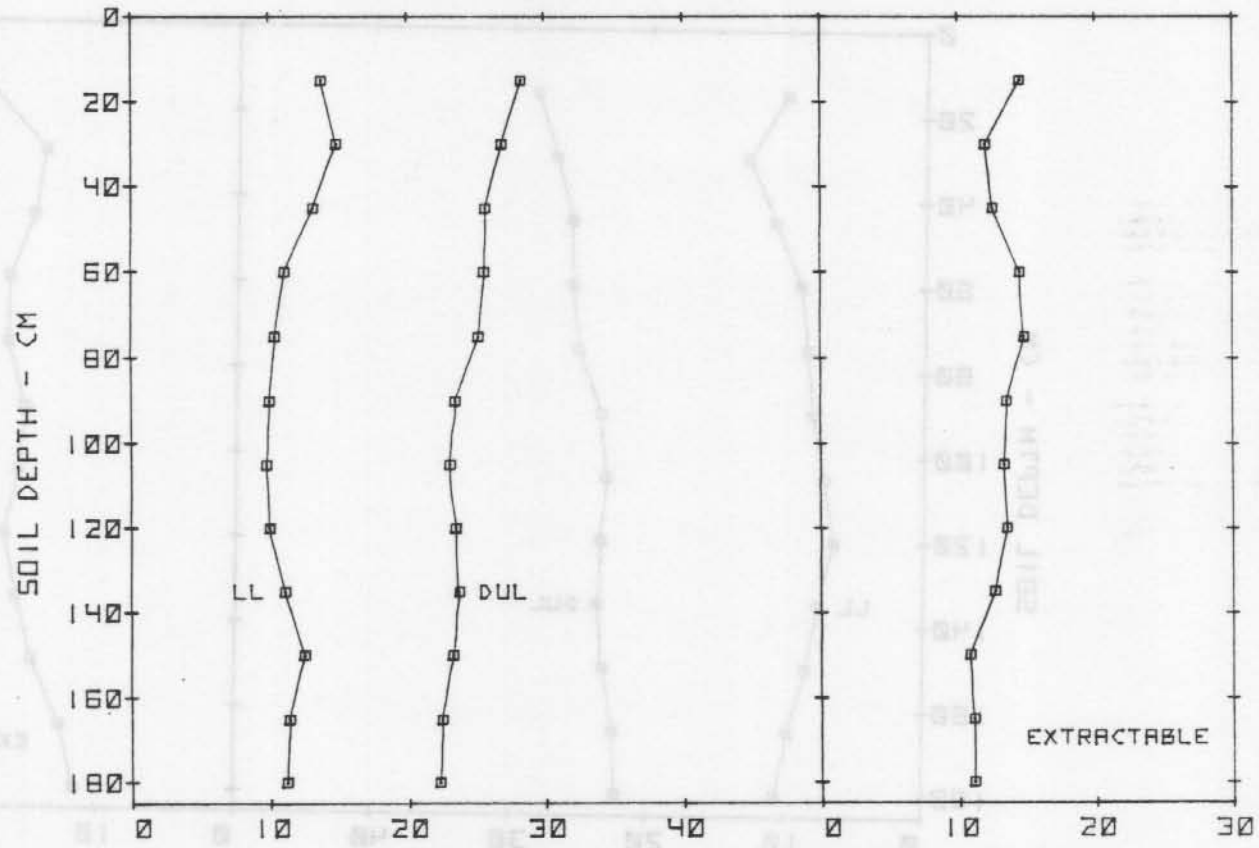
NORKA L-WASHINGTON CO.,CO.-WHEAT-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	10.1	28.3	18.2
30	12.9	26.9	14.0
45	10.9	25.7	14.8
60	9.0	25.6	16.6
75	8.5	25.2	16.7
90	8.1	23.5	15.4
105	7.3	23.1	15.8
120	6.6	23.5	16.9
135	7.7	23.7	16.0
150	8.5	23.3	14.8
165	9.8	22.5	12.7
180	10.7	22.3	11.6

TOTAL WATER EXTRACTED FROM PROFILE = 28.9 Cm.

Pedon Number: S81CO-121-1

FIELD MEASURED SOIL WATER LIMITS



NORKA L-WASHINGTON CO./CO.-CORN-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	13.8	28.3	14.5
30	14.9	26.9	12.0
45	13.2	25.7	12.5
60	11.1	25.6	14.5
75	10.4	25.2	14.8
90	10.0	23.5	13.5
105	9.8	23.1	13.3
120	10.0	23.5	13.5
135	11.1	23.7	12.6
150	12.5	23.3	10.8
165	11.4	22.5	11.1
180	11.2	22.3	11.1

TOTAL WATER EXTRACTED FROM PROFILE = 24.2 Cm.

PARSHALL

CLASSIFICATION: COARSE-LOAMY, MIXED, PACHIC HAPLOBOROLL

S 80ND-059 -002 SAMPLE NOS. 80P2354 - 2360 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2-.0002	TOTAL FINE LT .0002	CLAY LT .002	FINE SILT .002-.02	COARSE SILT .02-.05	VF SAND .05-.10	F SAND .10-.25	M SAND .25-.50	C SAND .5-1	VC SAND 1-2	COARSE FRAGMENTS(MM) WEIGHT 2-5	5-20	20-75	.1-75	>2MM PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
802354	1	0- 23	AP	11.6	28.0	60.4			9.1	18.9	21.3	32.7	7.0	1.1	0.3	TR	--	--	41	--
802355	2	23- 58	A12	11.6	24.5	63.9			8.7	15.8	21.6	34.2	7.2	0.8	0.1	TR	--	--	42	--
802356	3	58- 76	B21	9.9	23.2	66.9			7.4	15.8	23.8	36.0	6.3	0.6	0.2	TR	TR	--	43	--
802357	4	76- 91	B22	8.2	16.7	75.1			5.7	11.0	25.5	41.2	7.3	0.9	0.2	TR	TR	--	50	--
802358	5	91-122	C1CA	7.0	12.0	80.2		2	4.1	7.9	25.6	45.8	7.5	1.0	0.3	TR	TR	--	55	TR
802359	6	122-152	A1B	11.8	27.5	60.7		3	9.4	18.1	28.1	26.7	4.4	0.6	0.4	TR	TR	--	33	--
802360	7	152-213	C2CA	10.2	29.3	60.5		2	9.8	19.5	32.5	23.3	4.0	0.6	0.1	TR	TR	--	28	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B1B	EXTR P 6S1A	TOTAL S 6R3A	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8D1	15 BAR 8D1	LIMITS LL 4F1	LIMITS PI 4F	FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE 4B1A	2- 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
802354	1	1.14	0.099						1.13	0.55							9.0		6.4		
802355	2	1.10	0.099						1.18	0.56							8.7		6.5		
802356	3	0.80							1.22	0.62							8.0		6.1		
802357	4	0.58							1.17	0.61							6.6		5.0		
802358	5	0.40							0.97	0.62							5.9		4.8		
802359	6	0.55							0.90	0.50							9.1		5.9		
802360	7	0.38							0.92	0.56							8.1		5.7		

SAMPLE NO.	HZN NO.	CA 5B4A 6N2E	MG 5B4A 6Q2D	NA 5B4A 6P2B	K 5B4A 6W2B	SUM BASES 6H2B	ACIDITY 6G1E	EXTR AL 5A3A	SUM CATS 5A8A	CEC NH4- 5A3B	BASES + AL 5G1	AL SAT 5G3	BASE SUM 5C1	SAT- NH4 6E1B	CG3 AS CACO3 <2MM 8E1	RES. OHMS /CM	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1E	PH H2O 8C1A
		<- MEQ / 100 G ->									<- PCT ->							1:2	1:1
802354	1	10.1	2.8	0.1	0.5	13.5	2.3		15.8	13.1		85	100	--			0.09	6.1	6.9
802355	2	11.2	3.2	0.2	0.3	14.9	1.0		15.9	13.7		94	100	--			0.09	6.5	7.2
802356	3	10.7	2.9	0.1	0.2	13.9	0.9		14.8	12.1		94	100	--			0.13	6.9	7.5
802357	4		3.0	TR	0.2					9.6			100	TR			0.20	7.5	7.9
802358	5		3.1	TR	0.2					7.6			100	3			0.18	7.6	8.1
802359	6		5.7	0.1	0.2					10.6			100	4			0.21	7.7	8.2
802360	7		7.8	TR	0.2					9.4			100	5			0.20	7.8	8.3

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY OTA <2U 7A3	MINERALOGY OTA <2U 7A3	TOT ANL CLAY K2O 6Q3A	TOT ANL CLAY Fe 6G7A
		<- RELATIVE AMOUNTS ->						<- PCT ->	
802354	1								
802355	2	MT 4	MI 3	KK 2	VR 2	KK 5		1.8	5.2
802356	3								
802357	4	MT 4	MI 3	KK 3	VR 2	KK 4		1.7	5.8
802358	5								
802359	6								
802360	7	MT 4	MI 2	KK 2	QZ 1	KK 5		1.4	5.7

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 10 PCT .1-75MM 46

MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS 1, 2, 3, 4, 5, 6, 7,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE VR VERMICULITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Parshall.

Pedon Number: S80ND-059-2

Classification: Coarse-loamy, mixed, Pachic Haploborolls.

Location: Morton County, North Dakota; 178 meters west and 119 meters north of the SE corner of the SW 1/4, Sec. 33, T.139N., R.81W.

Use and Vegetation: Pastureland - presently in bromegrass and alfalfa.

Parent Material: Alluvium.

Region: Rolling Soft Shale Plain - MLRA 54.

Position: High terrace of the Hart River.

Elevation: About 525 meters.

Drainage and Permeability: Well drained, moderately rapid permeability.

Water Table and Duration: None.

Slope: 1 to 2 percent, SE aspect.

Sampled and Described By: Larry F. Ratliff and James F. Strum Date: 8-26-80

Ap -- 0 to 23 cm.; black (10YR2/2) fine sandy loam, very dark grayish brown (10YR3/2) dry; weak fine granular structure; slightly hard, very friable; many fine and medium roots; neutral; clear smooth boundary. (802354).

A12 -- 23 to 58 cm.; black (10YR2/2) fine sandy loam, very dark grayish brown (10YR3/2) dry; weak medium prismatic parting to weak medium subangular blocky structure; slightly hard, very friable, many fine and medium roots; neutral; clear smooth boundary. (802355).

B21 -- 58 to 76 cm.; very dark grayish brown (10YR3/2) fine sandy loam, dark grayish brown (10YR4/2) dry; weak medium prismatic parting to weak medium subangular blocky structure; slightly hard, very friable; few fine roots; mildly alkaline; gradual smooth boundary. (802356).

B22 -- 76 to 91 cm.; dark brown (10YR3/3) light fine sandy loam, brown (10YR4/3) dry; weak medium subangular blocky structure; slightly hard, very friable; few fine roots; moderately alkaline; clear wavy boundary. (802357).

C1ca -- 91 to 122 cm.; brown (10YR4/3) loamy fine sand; brown (10YR5/3) dry; massive; slightly hard, very friable; few fine roots; carbonates are finely dispersed; violent effervescence, moderately alkaline; clear wavy boundary. (802358).

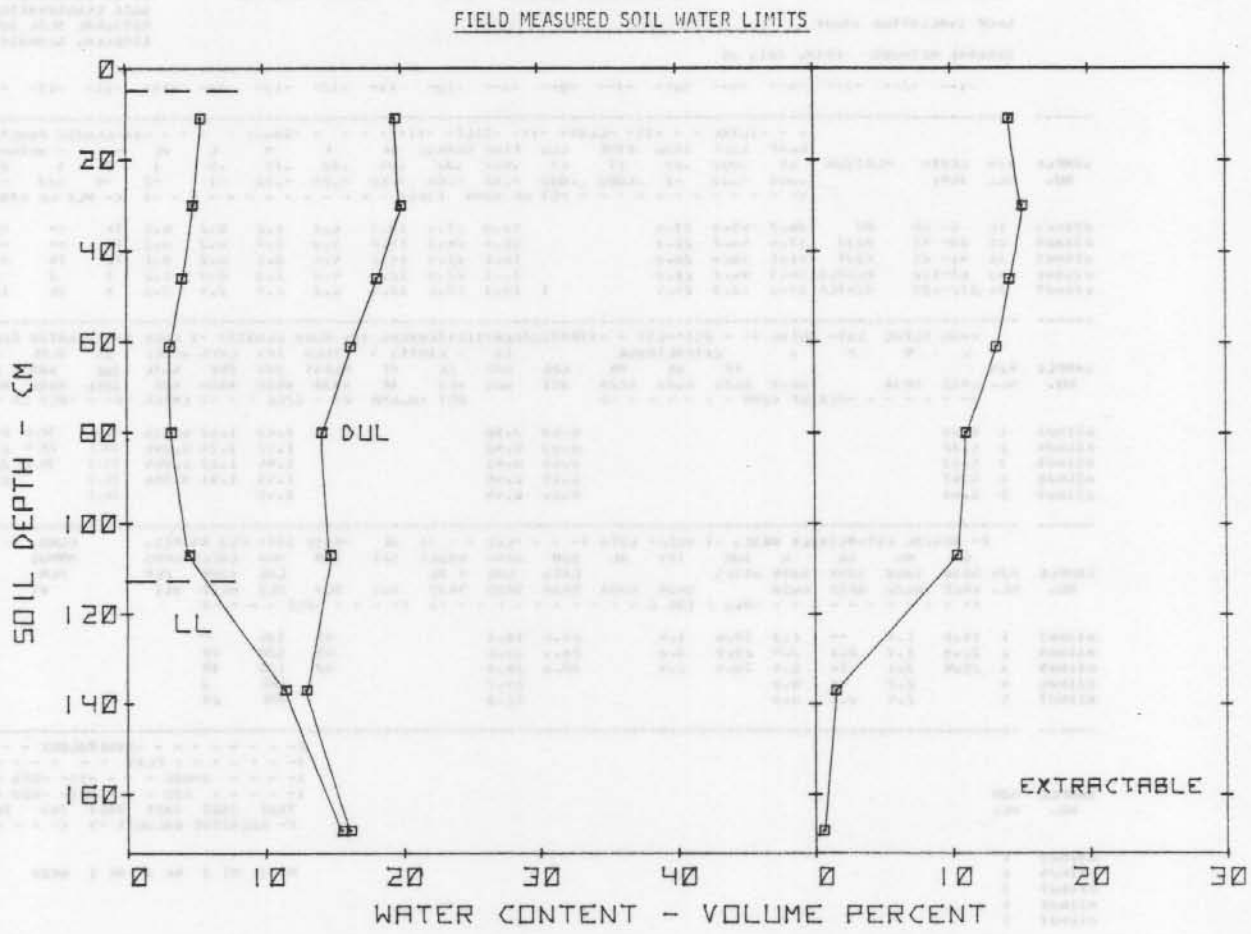
A1b -- 122 to 152 cm.; very dark grayish brown (10YR3/2) fine sandy loam, dark grayish brown (10YR4/2) dry; massive; slightly hard, very friable; few fine threads and soft masses of white $CaCO_3$; violent effervescence, moderately alkaline; gradual wavy boundary. (802359).

C2ca -- 152 to 213 cm.; brown (10YR4/3) very fine sandy loam, brown (10YR5/3) dry; massive; slightly hard, very friable; few coarse fragments generally less than 3 cm. diameter; carbonates are generally finely dispersed with a few fine threads and soft masses of white $CaCO_3$; violent effervescence, moderately alkaline. (802360).

Remarks: Two other nearby sites were examined. Soils are very similar. Depth to Cca ranged from 76 to 91 cm. and depth to A1b horizon ranged from 114 to 152 cm.

Field Measured Soil Water Data Contributed By: D. G. Harris, USDA-AR, Northern Great Plains Research Center, Mandan, ND.

Pedon Number: S80ND-059-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
11	5.4	19.6	14.2
30	4.8	20.0	15.2
46	4.0	18.2	14.2
61	3.1	16.3	13.2
80	3.2	14.2	11.0
107	4.5	14.8	10.3
137	11.5	13.0	1.5
168	15.6	16.2	0.6

TOTAL WATER EXTRACTED FROM PROFILE = 16.1 Cm.

PAYNE

CLASSIFICATION: FINE, MONTMORILLONITIC, THERMIC UDIC PALEUSTALF

S 81TX-027-004 SAMPLE NOS. 81P1603 - 1607 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION STUDY

GENERAL METHODS 1978, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002 MM	TOTAL SILT .002-.05 MM	TOTAL SAND .05-2 MM	CLAY FINE LT .002 MM	CLAY COARSE .002-.02 MM	SILT FINE .02-.05 MM	SILT COARSE .05-.10 MM	SAND VF .10-.25 MM	SAND F .25-.50 MM	SAND M .5-1 MM	SAND C 1-2 MM	SAND VC 2-5 MM	CLARSE FRAG WEIGHT 5-20 MM	CLARSE FRAG WEIGHT 20-75 MM	CLARSE FRAG WEIGHT 75-381 MM	CLARSE FRAG WT >381 MM PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (SAT) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->			
81160 3	1S	0- 20	AP	26.7	45.4	27.9			16.0	27.4	19.1	6.8	1.2	0.2	0.1	TR	--	--	8	--
81160 4	2S	20- 41	B21T	37.4	40.7	21.9			16.4	24.3	15.8	5.0	0.7	0.2	0.2	TR	--	--	6	--
81160 5	3S	41- 81	B22T	41.1	38.9	20.0			16.1	22.9	14.2	5.4	0.1	0.2	0.1	TR	TR	--	6	TR
81160 6	4S	81-112	B23TCA	39.3	40.7	21.0			13.1	22.8	12.8	4.8	1.3	0.9	1.2	1	2	1	12	4
81160 7	5S	112-127	B24TCA	37.0	38.5	24.5		1	14.3	19.2	13.4	6.2	2.9	2.5	2.0	5	26	12	51	43

SAMPLE NO.	HZN NO.	TOTAL C 6A1C	TOTAL N 6B3A	TOTAL P	TOTAL S	EXTRACTABLE FE 6R3A	EXTRACTABLE AL 6G2B	EXTRACTABLE MN 6U7A	EXTRACTABLE CEC 8C1	15 BAR 0U1	ATTERBERG LIMITS LL 4F1	ATTERBERG LIMITS PI 4F	BULK DENSITY FIELD 1/3 MOIST 0AR	BULK DENSITY OVEN DRY 4A1D	BULK DENSITY 4MOLE SOIL 4A1H	CORE WATER CONTENT 2- 0.06 BAR 4B1A	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4G2A	WRD WHOLE SOIL 4C1
		<- - - - - - - -PCT OF <2MM - - - - - - - ->									PCT <0.44MM		<- - G/CC - - ->		CM/CM	<- - -PCT OF <2MM - - ->			CM/CM
81160 3	1	0.99							0.68	0.40			1.45	1.62	0.036	16.4	30.6	23.8	10.7	0.19
81160 4	2	0.72							0.63	0.42			1.52	1.74	0.046	23.1	28.5	23.6	15.7	0.12
81160 5	3	0.63							0.65	0.45			1.49	1.82	0.069	25.3	30.1	26.8	16.5	0.12
81160 6	4	0.47							0.69	0.45			1.53	1.81	0.056	24.5		23.7	17.3	0.10
81160 7	5	0.47							0.60	0.45			1.50			24.5			16.7	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B3A	MG 5B5A	NA 5B9A	K 5B5A	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4+ + AL 5A8B	BASES SAT 5A39	BASE SAT SUM 5G1	SAT NH4 CAL 5C3	CO3 AS CACO3 <2MM 5C1	RES. OHMS /CM 6E1G	COND. MMHOS /CM 8I	PH CACL2 .01M 6C1F	PH H2O 1:1 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->						
81160 3	1	16.6	1.7	--	1.3	19.6	1.4		21.0	18.1		93	100	--			6.7	7.0
81160 4	2	22.8	1.7	0.1	0.9	25.5	0.8		26.3	23.6		97	100	TR			7.1	7.5
81160 5	3	25.4	2.1	1R	0.9	28.4	2.4		30.8	26.6		92	100	TR			7.2	7.8
81160 6	4		2.6	--	0.8					24.7			100	8			7.8	8.2
81160 7	5		2.4	0.1	0.8					22.3			100	24			7.8	8.2

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81160 3	1								
81160 4	2					MI 3	MI 3	KK 2 VM 1 KK20	2.6 5.4
81160 5	3								
81160 6	4								
81160 7	5								

ESTIMATED BULK DENSITY FOR LAYER 5.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Payne.

Pedon Number: S81TX-027-4.

Classification: Fine, montmorillonitic, thermic Udic Paleustalfs.

Location: Bell County, Texas: 0.5 mile northwest on County Road 436 from its intersection with the Leon River, then 0.5 mile south and 0.4 mile west on paved county road. Site is 20 meters north in cultivated field.

Use and Vegetation: Cropland - fallow when described - previously cropped to grain sorghum.

Parent Material: Ancient alluvium.

Region: Grand Prairie - MLRA 85.

Position: High Terrace.

Elevation: ----------

Drainage and Permeability: Well drained and slowly permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 3-11-81

Ap - 0 to 20 cm.; dark brown (7.5YR3/2) heavy loam; massive; very hard, friable; common fine roots; few fine pores; neutral; clear smooth boundary. (811603).

B21t - 20 to 41 cm.; dark reddish brown (5YR3/3) clay loam; moderate medium subangular blocky structure; very hard, firm; common fine roots; few fine and medium pores; thin continuous clay films on faces of peds that are slightly darker than matrix; few seams of material from overlying horizons; mildly alkaline; gradual wavy boundary. (811604).

B22t - 41 to 81 cm.; reddish brown (5YR3/4) clay; weak medium subangular blocky structure; very hard, firm; few fine roots and pores; thin continuous clay films on faces of peds; mildly alkaline; gradual wavy boundary. (811605).

B23tca - 81 to 112 cm.; reddish brown (5YR4/4) clay loam; weak medium subangular blocky structure; hard, firm; few fine roots and pores; thin patchy clay films on faces of peds and around concretions; common soft masses and filaments of $CaCO_3$; weak effervescence, moderately alkaline; gradual wavy boundary. (811606).

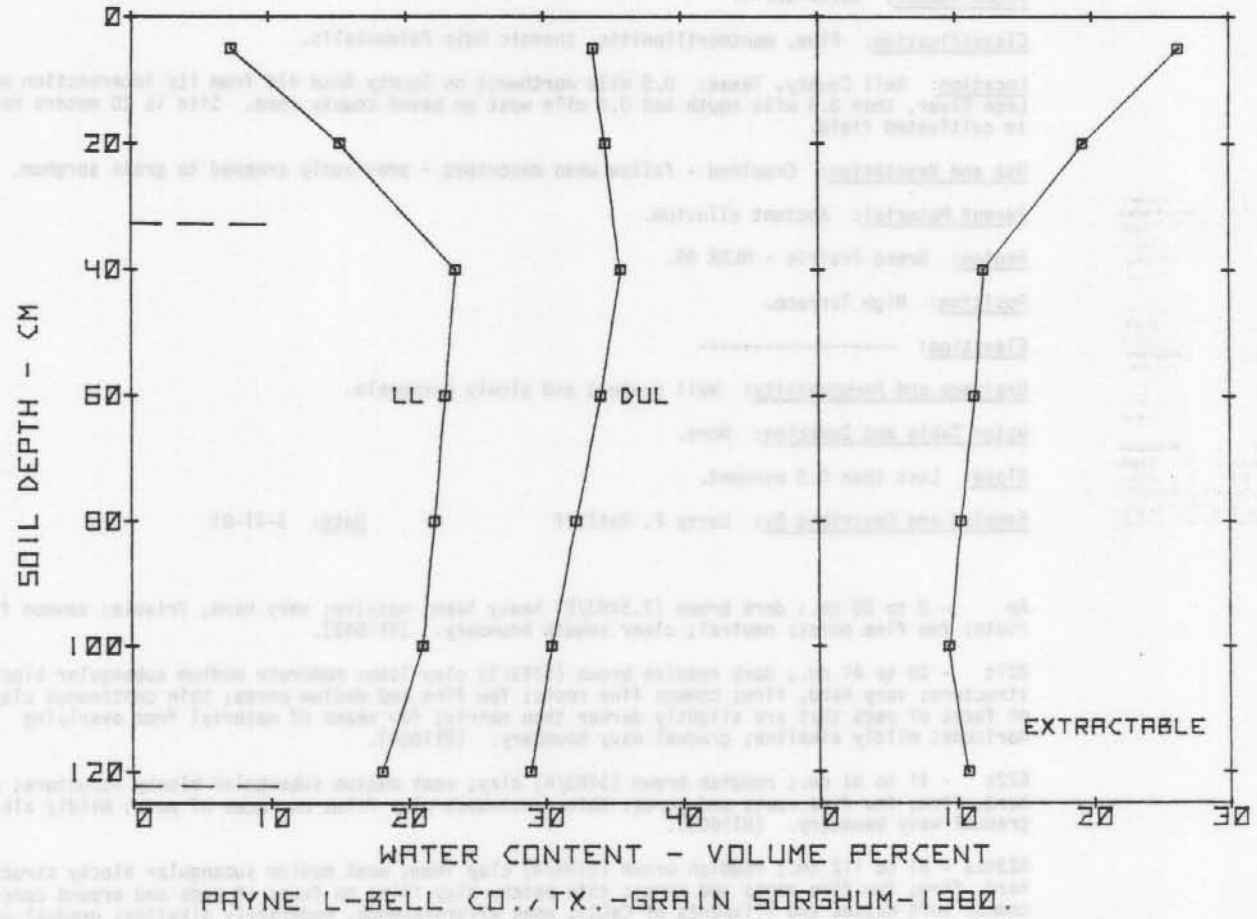
B24tca - 112 to 127 cm.; reddish brown (5YR4/4) clay loam; weak fine subangular blocky structure; very hard, firm; few fine roots and pores; about 40 percent by volume of pitted $CaCO_3$ concretions up to 7.5 cm. in diameter; strong effervescence, moderately alkaline. (811607).

Remarks: Colors are for moist soil. The pedon could not be described or sampled below 127 cm. because of the concretions.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S81TX-027-4

FIELD MEASURED SOIL WATER LIMITS



SOIL DEPTH	LL	DUL	EXTRACTABLE
Cm.	Volume Percent Water		
5	7.3	33.6	26.3
20	15.2	34.5	19.3
40	23.6	35.6	12.0
60	22.8	34.1	11.3
80	22.0	32.3	10.3
100	21.1	30.5	9.4
120	18.1	28.9	10.8

TOTAL WATER EXTRACTED FROM PROFILE = 17.4 Cm.

PEMBROKE

CLASSIFICATION: FINE-SILTY, MIXED, MESIC MOLLIC PALEUDALF

S 80RY-033 -001 SAMPLE NOS. 81P 747 - 754 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2-	CLAY FINE LT .0002	CLAY COS LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGMENTS(MM) WEIGHT 2-5	5-20	20-75	>2MM .1-75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
81 747	1	0- 18	AP	16.6	76.7	6.7			45.7	31.0	1.1	2.4	1.6	0.9	0.7	1	1	--	7	2
81 748	2	18- 48	A12	15.0	77.0	7.2			45.8	31.2	1.1	2.5	1.5	1.2	0.9	1	1	--	8	2
81 749	3S	30- 46	B21T	24.5	74.6	0.9			46.2	28.4	0.3	0.3	0.2	0.1	TR	TR	TR	--	1	--
81 750	4S	46- 61	B21T	27.0	71.3	0.9			44.6	26.7	0.4	0.4	0.1	TR	TR	--	--	--	TR	--
81 751	5S	61- 76	B22T	27.0	71.0	1.2			43.8	28.0	0.4	0.5	0.2	0.1	--	--	--	--	1	--
81 752	6S	76- 91	B22T	23.1	74.3	1.8			44.5	30.0	0.6	0.8	0.3	0.1	TR	--	--	--	1	--
81 753	7S	109-124	B23T	25.7	70.6	3.7			40.8	29.7	1.2	1.7	0.5	0.2	0.1	--	--	--	2	--
81 754	8S	135-150	B24T	27.7	66.3	6.0			38.8	27.5	1.7	3.0	0.6	0.4	0.1	--	--	--	4	--

SAMPLE NO.	HZN NO.	CARBON TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	EXTR S	EXTRACTABLE FE 6K3A	EXTRACTABLE AL 6C2B	EXTRACTABLE MN 6G7A	EXTRACTABLE CA 6D2A	CEC 8D1	15 BAR 8G1	RATIO/CLAY LIMITS - LL 4F1	RATIO/CLAY LIMITS - PI 4F	ATTERBERG FIELD MOIST 4B3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	BULK DENSITY WHOLE SOIL 4D1	COLE 2-0.06 BAR 4B1A	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4G1
		<- PCT OF <2MM ->										PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->			CM/CM
81 747	1	1.78	0.153							0.82	0.52				1.40			15.6		8.6	
81 748	2	1.85	0.160							0.87	0.53				1.50			15.4		8.3	
81 749	3	0.26	0.051							0.42	0.44				1.47	1.56	0.020	17.7	25.7	24.2	10.8	0.20
81 750	4	0.19								0.47	0.47				1.45	1.64	0.042	19.5	29.6	27.6	13.1	0.21
81 751	5	0.15								0.49	0.47				1.43	1.57	0.032	18.9		26.3	12.7	0.19
81 752	6	0.14								0.52	0.48				1.43	1.55	0.027	17.3		25.8	11.4	0.21
81 753	7	0.11								0.43	0.42				1.47	1.59	0.027	16.2		24.4	10.8	0.20
81 754	8	0.09								0.40	0.42				1.52	1.62	0.021	16.6		22.1	11.5	0.16

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES 6H5A	ACID-ITY 6G9A	EXTR AL	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	BASE SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- MEQ / 100 G ->										<- PCT ->						1:2	1:1
81 747	1	16.7	0.7	TR	0.8	18.2	2.3		20.5	13.6			89	100	1				6.9	7.3
81 748	2	16.9	0.6	TR	0.7	18.2	2.0		20.2	13.8			90	100	1				6.8	7.2
81 749	3	9.7	0.5	--	0.6	10.8	2.2		13.0	10.4			83	100	TR				6.9	7.3
81 750	4	12.3	0.8	TR	0.6	13.7	2.9		16.6	13.2			83	100	TR				7.1	7.6
81 751	5	12.4	0.5	TR	0.6	13.9	2.1		16.0	13.3			87	100	TR				7.1	7.6
81 752	6	11.3	1.0	0.1	0.5	12.9	2.3		15.2	12.3			85	100	TR				7.1	7.6
81 753	7	9.5	1.2	0.1	0.5	11.3	2.2		13.5	11.1			84	100	TR				7.0	7.6
81 754	8	8.4	1.4	--	0.5	10.8	2.5		13.3	11.0			81	98	TR				6.9	7.5

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DIA <2U 7A3	7A3	TOT ANL 7C3 CLAY K20 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
81 747	1							2.0	5.6
81 748	2	MI 2	KK 2	VR 1	QZ 1				
81 749	3							2.0	8.1
81 750	4	KK 3	MI 3	VR 2	MT 2	KK26			
81 751	5							1.7	8.3
81 752	6	KK 3	MI 2	MT 2	VR 1	KK20			
81 753	7								
81 754	8								

ESTIMATED BULK DENSITY FOR LAYER 1, 2.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE VR VERMICULITE QZ QUARTZ MT MONTMORILL

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Pembroke.

Pedon Number: S80KY-033-1

Classification: Fine-silty, mixed, mesic Mollic Paleudalfs.

Location: Caldwell County, Kentucky: 1.3 miles SE on State Highway 91 from its intersection with US Highway 62 in Princeton, then 90 meters SW in field. Site is 20 meters SW of the SW corner of the head house of the Western Kentucky Agr. Experiment Station.

Use and Vegetation: Cropland - presently cropped to winter wheat in a corn, wheat, soybean rotation.

Parent Material: Soil formed in limestone residuum with loess influence.

Region: Highland Rim and Pennyroyal - MLRA 122.

Position: Ridgetop of rolling upland.

Elevation: ----------

Drainage and Permeability: Well-drained, moderately slow permeability.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff and Grant Thomas Date: 11-18-80

Ap -- 0 to 18 cm.; dark reddish gray (5YR3/2) silt loam; weak fine and medium granular structure; hard, firm; common fine and medium roots; few fine and medium pores; few charcoal fragments; about 10 percent by volume of partially decomposed organic residue; neutral; clear smooth boundary. (810747).

A12 -- 18 to 28 cm.; dark reddish brown (5YR3/2) silt loam; weak medium subangular blocky structure; hard, firm; common fine and medium roots; few fine and medium pores; few charcoal fragments; about 5 percent by volume partially decomposed organic residue; neutral; clear smooth boundary. (810748).

B21t -- 28 to 61 cm.; strong brown (7.5YR5/6) silt loam; weak medium subangular blocky structure; very hard, firm; few fine roots and pores; thin patchy clay films on faces of peds; mildly alkaline; gradual wavy boundary. (810749, 750).

B22t -- 61 to 102 cm.; strong brown (7.5YR5/6) silt loam; weak medium subangular blocky structure, very hard, firm; few fine roots; few fine and very fine pores; thin patchy clay films on faces of peds; horizon is slightly compact with about 20 percent by volume of brittle bodies; about 5 to 10 percent of peds have light brown silt coatings; mildly alkaline; clear wavy boundary. (810751, 752).

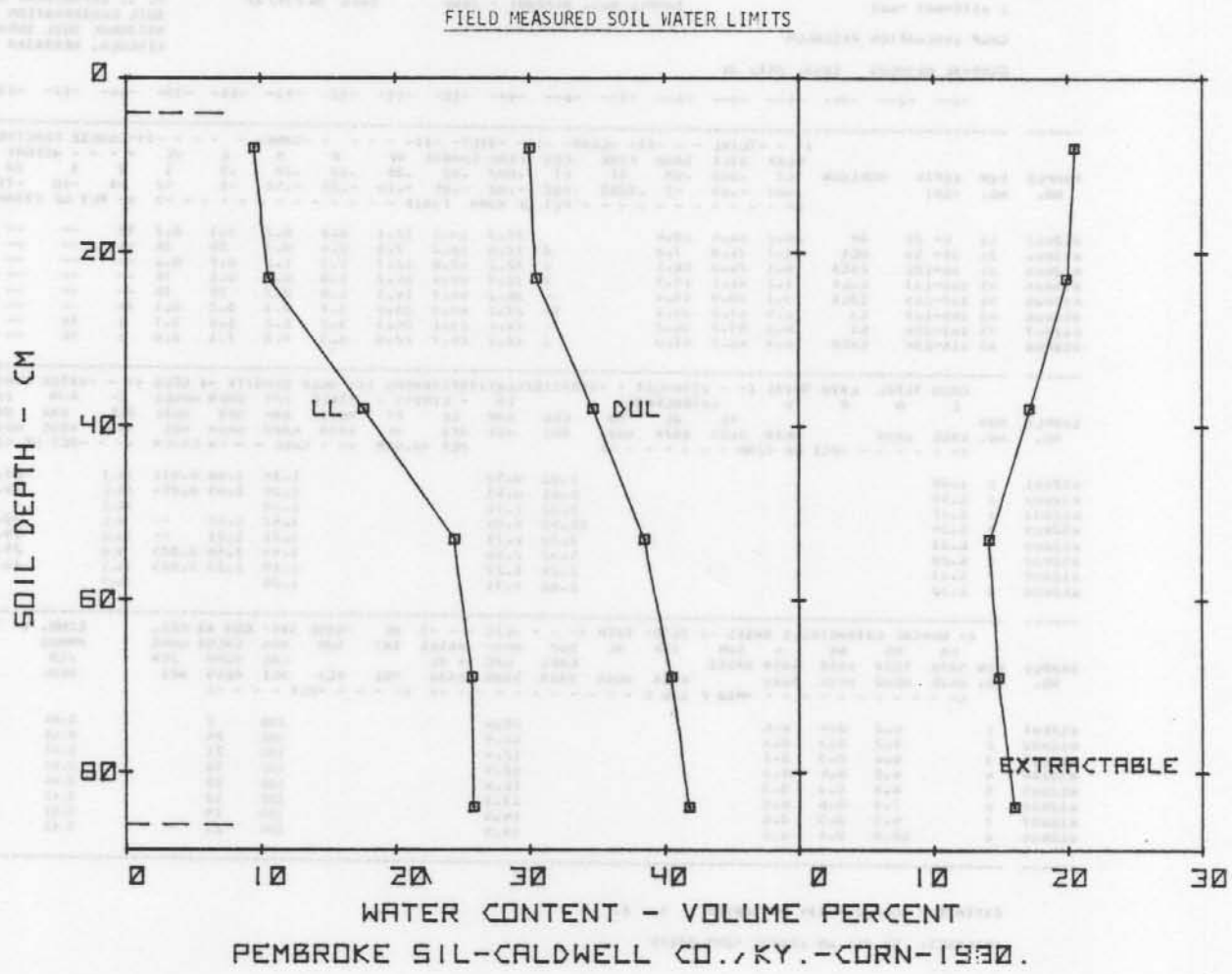
B23t -- 102 to 132 cm.; yellowish red (5YR5/6) silt loam; weak medium subangular blocky structure; very hard, firm; few fine and very fine pores; thin patchy clay films on faces of peds; horizon is slightly compact with about 5 to 10 percent brittle bodies; about 5 to 10 percent of peds have light brownish gray silt coatings; mildly alkaline; gradual wavy boundary. (810753).

B24t -- 132 to 152 cm.; red (2.5YR4/6) silty clay loam; weak medium subangular blocky structure; very hard, firm; few fine pores; thin patchy clay films on faces of peds; about 5 percent of peds have light gray silt coatings; few dark organic stains on faces of peds; strongly acid. (810754).

Remarks: Colors are for moist soil. The clay content of the lower Bt horizon is less than typical for the series.

Field Measured Soil Water Data Contributed by: G. W. Thomas and R. E. Phillips, Dept. of Agronomy, University of Kentucky.

Pedon Number: S80KY-033-1



SOIL DEPTH Cm.	LL	DUL Volume Percent Water	EXTRACTABLE
8	9.5	30.0	20.5
23	10.6	30.5	19.9
38	17.6	34.7	17.1
53	24.4	38.5	14.1
69	25.7	40.5	14.8
84	25.8	41.8	16.0

TOTAL WATER EXTRACTED FROM PROFILE = 15.6 Cm.

PLAINFIELD

CLASSIFICATION: COARSE-SILTY, MIXED, MESIC DURIXEROLLIC CALCIORTHID

S 81IC-082 -061 SAMPLE NOS. 81PZ801 - 2808 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

				-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-	-18-	-19-	-20-
				(- - -TOTAL - - -)(- -CLAY- -)(- -SILT- -)(- - - - -SAND- - - - - -)(-COARSE FRACTIONS(MM)-)(>2MM)																			
				CLAY	SILT	SAND	FINE	CO3	FINE	COARSE	VF	F	M	C	VC	- - - - WEIGHT - - - -					WT	
SAMPLE	HZN	DEPTH	HORIZON	LT	.002	.05	LT	LT	.002	.02	.05	.10	.25	.5	1	2	5	20	.1-	PCT OF		
NO.	NO.	(CM)		.002	-.05	-2	.0002	.002	-.02	-.05	-.10	-.25	-.50	-1	-2	-5	-20	-75	75	WHOLE		
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				SOIL		
812801	1S	0- 28	AP	20.2	66.4	13.4			27.3	39.1	12.1	0.8	0.2	0.1	0.2	TR	--	--	1	--		
812802	2S	28- 58	BCA	21.2	71.0	7.8		d	32.8	38.2	7.3	0.4	0.1	TR	TR	--	--	--	TR	--		
812803	3S	58-102	C1CA	4.1	79.8	16.1		1	32.2	47.6	12.7	1.3	1.2	0.7	0.2	--	--	--	3	--		
812804	4S	102-137	C2CA	1.2	81.1	17.7		1	31.7	49.4	16.2	1.0	0.4	0.1	TR	--	--	--	1	--		
812805	5S	137-165	C2CA	3.7	80.9	15.4		--	30.2	44.7	14.3	0.9	0.2	TR	TR	--	--	--	1	--		
812806	6S	165-183	C3	2.5	67.2	30.3		TR	27.2	40.0	28.0	1.7	0.3	0.2	0.1	TR	--	--	2	--		
812807	7S	183-216	C3	0.6	57.2	30.2		--	28.1	29.1	26.3	3.2	1.2	1.8	3.7	1	TR	--	11	1		
812808	8S	216-254	C4CA	6.3	46.7	47.0		2	22.1	24.7	22.0	6.3	4.8	7.1	6.8	1	TR	--	26	1		

		CRGN	TOTAL	EXTR	TOTAL	(- - DITH-CIT - -)			TRATIO/CLAY		(ATTERBERG		(- BULK DENSITY -)			COLE	(- - - WATER CONTENT - - -)				WRD	
		C	N	P	S	EXTRACTABLE				1S	- LIMITS -		FIELD	1/3	OVEN	WHOLE	2-	0.06	1/3	15	WHOLE	
SAMPLE	HZN					FE	AL	MN	CEC	BAR	LL	PI	MOIST	BAR	DRY	SOIL	BAR	BAR	BAR	BAR	SOIL	
NO.	NO.	6A1C	6B3A		6K3A	6G2D	6G7A	6G2A	8D1	8D1	4F1	4F	4A3A	4A1D	4A1H	4D1	4B1A	4B1C	4B1C	4B2A	4C1	
		<- - - - - - PCT OF <2MM - - - - - - - ->									PCT	<0.4MM	<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - - ->				CM/CM	
812801	1	1.00							1.02	0.53				1.35	1.48	0.031	16.3		23.0	10.8	0.16	
812802	2	0.59							0.01	0.53				1.39	1.45	0.014	18.1		26.0	11.3	0.20	
812803	3	0.37							3.02	1.71				1.50			12.2			7.0		
812804	4	0.24							10.50	5.08				1.42	1.42	--	9.1		20.3	6.1	0.20	
812805	5	0.23							3.22	1.73				1.21	1.21	--	10.0		19.9	6.4	0.16	
812806	6	0.20							5.32	2.56				1.44	1.46	0.005	9.8		25.9	6.4	0.28	
812807	7	0.23							2.24	1.27				1.19	1.20	0.003	14.1		18.9	8.4	0.12	
812808	8	0.32							2.62	1.75				1.20			16.7			11.0		

		(- NH4OAC EXTRACTABLE BASES -)				ACID-	EXTR	(- - - -CEC - - - -)			AL	-BASE	SAT-	CO3 AS	RES.	COND.	(- - - -PH - - - -)	
		CA	MG	NA	K	SUM	ITY	AL	SUM	NH4-	BASES	SAT	SUM	NH4	CACO3	OHMS	MMHOS	CACL2	H2O
SAMPLE	HZN	5B5A	5E5A	5B5A	5B5A	BASES			CALS	OAC	+ AL			OAC	<2MM	/CM	/CM	.01M	
NO.	NO.	6N2E	6Q2D	6P2B	6Q2B		6H5A	6G9A	5A3A	5A8B	5A3B	5G1	5C3	5C1	6E1G	8E1	8A3A	8C1F	8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - - ->										<- - - - -PCT - - - ->						1:2	1:1
812801	1		0.2	0.9	0.6				20.6				100	2			0.65	7.5	8.0
812802	2		5.2	0.3	0.3				12.9				100	24			0.48	7.7	8.4
812803	3		6.6	0.3	0.2				12.4				100	21			0.47	7.8	8.5
812804	4		6.2	0.4	0.3				12.6				100	16			0.45	7.9	8.5
812805	5		6.5	0.3	0.3				11.9				100	18			0.44	8.1	8.6
812806	6		7.8	0.6	0.5				13.3				100	12			0.45	8.1	8.6
812807	7		4.4	0.3	0.6				14.8				100	15			0.51	8.1	8.6
812808	8		10.8	0.4	0.7				16.5				100	23			0.45	8.1	8.5

ESTIMATED BULK DENSITY FOR LAYER 3, 6.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

Series: Portneuf taxadjunct[1/].

Pedon Number: S81ID-083-1

Classification: Coarse-silty, mixed, mesic Durixerollic Calciorthids.

Location Twin Falls County, Idaho: (No legal description available). Site is near neutron tube #2 of Jim Wright's 1978 Wheat Study on the Snake River Conservation Research Center at Kimberly, Idaho.

Use and Vegetation: Cropland - presently in alfalfa.

Parent Material: Loess - influenced by local alluvium, lake sediments and volcanic ash over basalt.

Region: Snake River Plains - MLRA 11.

Position: Upland.

Elevation: About 1200 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 6-18-81

Ap - 0 to 28 cm.; very dark grayish brown (10YR3/2) silt loam; weak fine and medium granular structure; hard, very friable; many fine and medium roots; common wormcasts; weak effervescence, moderately alkaline; gradual smooth boundary. (812801).

Bca - 28 to 58 cm.; pale brown (10YR6/3) silt loam; weak coarse platy parting to weak fine subangular blocky structure; very hard, friable; many fine and medium roots; common fine and medium pores; few wormcasts; few rounded and brittle nodules; common light brownish gray (10YR6/2) coatings on plates and nodules; dark brown and yellowish brown stains around roots; violent effervescence, moderately alkaline; clear wavy boundary. (812802).

C1ca - 58 to 102 cm.; pale brown (10YR6/3) silt loam; moderate coarse irregular platy structure; extremely hard, very firm and compact in place; plates are brittle but surrounded by a friable matrix; common rounded and brittle nodules are irregularly distributed throughout the horizon; common fine and very fine roots between plates; common fine and very fine pores, few coarse pores; few fine faint yellowish brown mottles; few threads of CaCO3; violent effervescence, strongly alkaline; gradual wavy boundary. (812803).

C2ca - 102 to 165 cm.; pale brown (10YR6/3) silt; weak coarse irregular platy structure; very hard, firm and slightly compact in place; about 20 percent by volume of brittle plates in a friable matrix; few rounded and brittle nodules; common fine and medium roots; common fine and very fine pores, few coarse pores; violent effervescence, strongly alkaline; diffuse wavy boundary. (812804, 805).

C3 - 165 to 216 cm.; brown (10YR5/3) silt loam; massive; hard, friable; few brittle plates; few fine roots; common fine pores; strong effervescence, strongly alkaline; clear wavy boundary. (812806, 807).

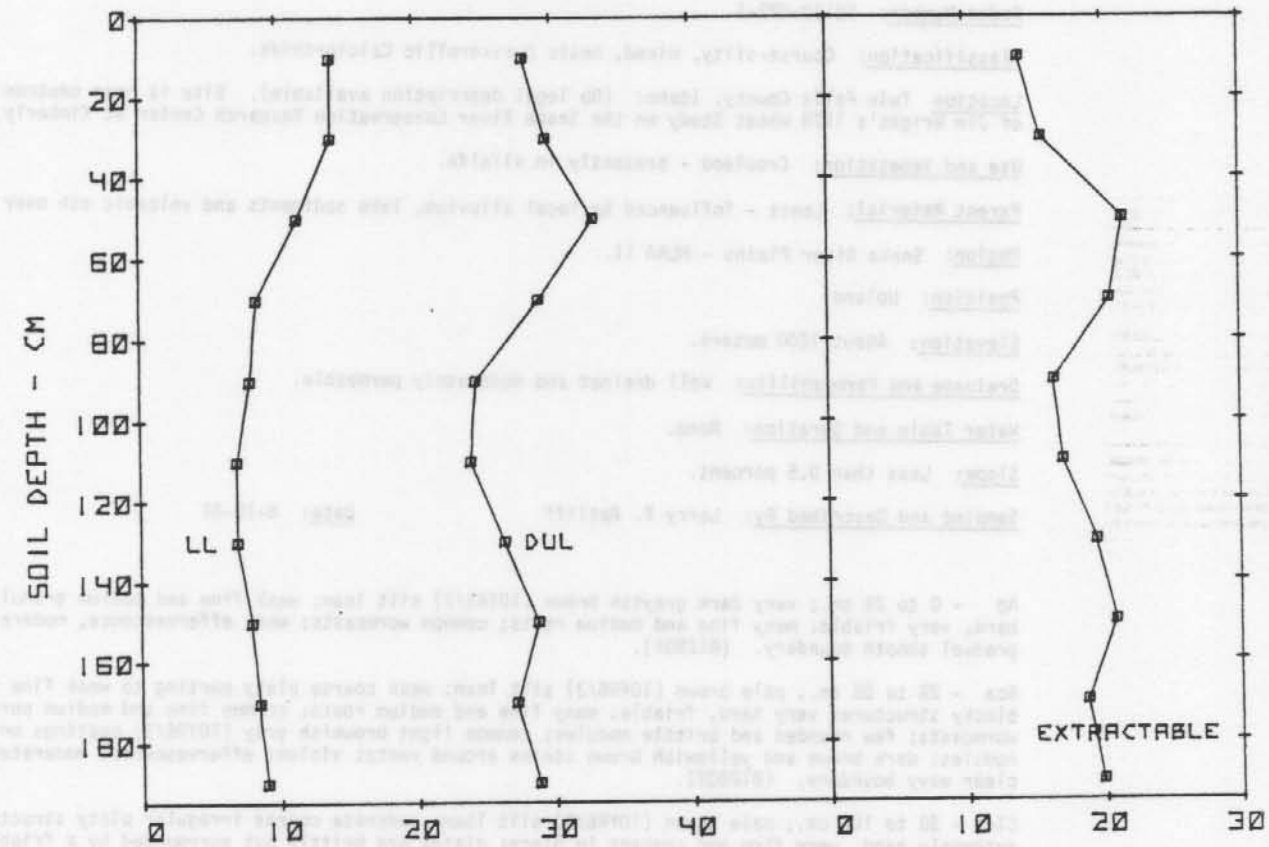
C4ca - 216 to 254 cm.; brown (10YR5/3) very fine sandy loam; massive; hard, friable; about 20 percent coarse brittle plates consisting of layers of white CaCO3 and brown silica; common fine pores; violent effervescence, strongly alkaline. (812808).

Remarks: [1/]This pedon is a taxadjunct to the Portneuf series in that it has darker colors and more organic carbon than typical. This is believed to be the result of long term irrigation. The degree of cementation in the C1ca is approaching a duripan. Colors are for moist soil. The data were not included in the analysis because of incomplete dispersion of samples - silica binding.

Field Measured Soil Water Data Contributed By: J. L. Wright, USDA-AR, Snake River Conservation Research Center, Kimberly, Idaho.

Pedon Number: S81ID-083-1

FIELD MEASURED SOIL WATER LIMITS



PORTNEUF SIL-TWIN FALLS CO./ID.-ALFALFA-1981.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	14.0	28.0	14.0
30	14.0	29.6	15.6
50	11.5	33.0	21.5
70	8.5	29.0	20.5
90	8.0	24.4	16.4
110	7.0	24.0	17.0
130	7.0	26.4	19.4
150	8.0	28.8	20.8
170	8.5	27.2	18.7
190	9.0	28.8	19.8

TOTAL WATER EXTRACTED FROM PROFILE = 36.7 Cm.

PORTAGE

CLASSIFICATION: COARSE-SILTY, MIXED, MESIC DURIXEROLLIC CALCIORTHID

S 81IO-083 -002 SAMPLE NOS. 81P2809 - 2814 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	TOTAL FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	COARSE FRACTIONS(MM) WEIGHT 5 -20	COARSE FRACTIONS(MM) WEIGHT 20 -75	COARSE FRACTIONS(MM) WEIGHT 75 .1-	>2MM PCT OF WHOLE SOIL
				<- - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
812809	1S	0- 25	AP	18.8	66.4	12.8		2	31.0	37.4	11.4	1.0	0.2	0.1	0.1	TR	--	--	1	--
812810	2S	25- 43	BCA	12.0	76.6	11.4		5	35.2	41.4	9.6	1.1	0.4	0.2	0.1	--	--	--	2	--
812811	3S	43- 91	C1CA	24.9	75.5	21.6		1	29.7	45.8	14.3	2.1	2.5	2.4	0.3	--	--	--	7	--
812812	4S	91-137	C2CA	21.1	77.8	20.1		TR	26.2	51.6	18.6	1.1	0.3	0.1	TR	--	--	--	1	--
812813	5S	137-196	C3	4.5	77.8	17.3		1	31.7	46.1	16.4	0.8	0.1	TR	TR	TR	--	--	1	--
812814	6S	196-244	C4	5.0	68.0	27.0			27.6	40.5	25.6	1.2	0.1	0.1	TR	TR	--	--	1	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S	DITH-CIT EXTRACTABLE FE 6G2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6G24	RATIO/CLAY CEC 15 BAR 8D1	RATIO/CLAY 8D1	ATTERBERG LIMITS LL 4F1	ATTERBERG LIMITS PI 4F	BULK DENSITY FIELD MOIST 8AR 4A3A	BULK DENSITY 1/3 BAR DRY 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4U1	WATER CONTENT 2- 0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - - ->				CM/CM
812809	1	0.75							0.97	0.56			1.45	1.55	0.022	15.4			21.4	10.5	0.16
812810	2	0.47							0.46	0.78			1.36	1.40	0.010	15.5			27.6	9.4	0.25
812811	3	0.34							4.07	2.38			1.40			10.2				6.9	
812812	4	0.21							5.67	3.19			1.40			8.6				6.7	
812813	5	0.22							2.53	1.47			1.40			10.5				7.2	
812814	6	0.20							2.72	1.46			1.55	1.35	--	11.2			23.7	7.3	0.22

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H3A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F	PH H2O 1:2 8C1F 1:1
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->								
812809	1		5.7	0.3	0.6					18.3				100	8		0.66		8.0	8.2
812810	2		4.8	0.3	0.2					11.8				100	27		0.69		8.1	8.4
812811	3		7.3	1.4	0.2					11.8				100	22		0.50		8.2	8.5
812812	4		6.8	0.3	0.3					11.9				100	17		0.46		8.0	8.5
812813	5		7.0	0.3	0.5					12.4				100	15		0.60		8.2	8.5
812814	6		8.3	0.4	0.8					13.6				100	10		0.54		8.2	8.5

ESTIMATED BULK DENSITY FOR LAYER 3, 4, 5,

ANALYSES: S= ALL LN SIEVED <2MM BASIS

Series: Portneuf.

Pedon Number: S81ID-083-2

Classification: Coarse-silty, mixed, mesic Durixerollic Calciorthids.

Location: Twin Falls County, Idaho: (No legal description available). Site is between the "field capacity plots" of Jim Wright's and John Hanks' 1980 and 1981 wheat, corn and alfalfa study on the Snake River Conservation Research Center at Kimberly, Idaho.

Use and Vegetation: Cropland - presently fallow - previously cropped to beans.

Parent Material: Loess - influenced by local alluvium, lake sediments and volcanic ash over basalt.

Region: Snake River Plains - MLRA 11.

Position: Upland.

Elevation: About 1200 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 6-19-81

Ap - 0 to 25 cm.; dark brown (10YR4/3) silt loam; weak fine and medium granular structure; hard, very friable; common fine roots; few fine pores; few wormcasts and burrows filled with material from the underlying horizons; strong effervescence, moderately alkaline; clear smooth boundary. (812809).

Bca - 25 to 43 cm.; pale brown (10YR6/3) silt loam; moderate medium platy parting to weak fine subangular blocky structure; hard, friable with a few brittle nodules; common fine roots and pores, few medium pores; few fine faint light brownish gray (10YR6/2) coatings on plates and nodules; few fine faint yellowish brown stains; violent effervescence, moderately alkaline; clear wavy boundary. (812810).

C1ca - 43 to 91 cm.; brown (10YR5/3) silt loam; moderate coarse irregular platy structure that is interrupted by rounded nodules; extremely hard, plates and nodules are brittle and compact in place but are surrounded by a friable matrix; few fine roots between plates; common fine pores, few medium and coarse pores; common very fine yellowish brown stains; horizon gets less brittle with depth; violent effervescence, strongly alkaline; gradual wavy boundary. (812811).

C2ca - 91 to 137 cm.; brown (10YR5/3) silt loam; weak coarse irregular platy structure; very hard, compact and brittle in about 20 percent of the mass and friable between plates; few brittle nodules; common fine and very fine pores; common dark brown stains; violent effervescence, strongly alkaline; gradual wavy boundary. (812812).

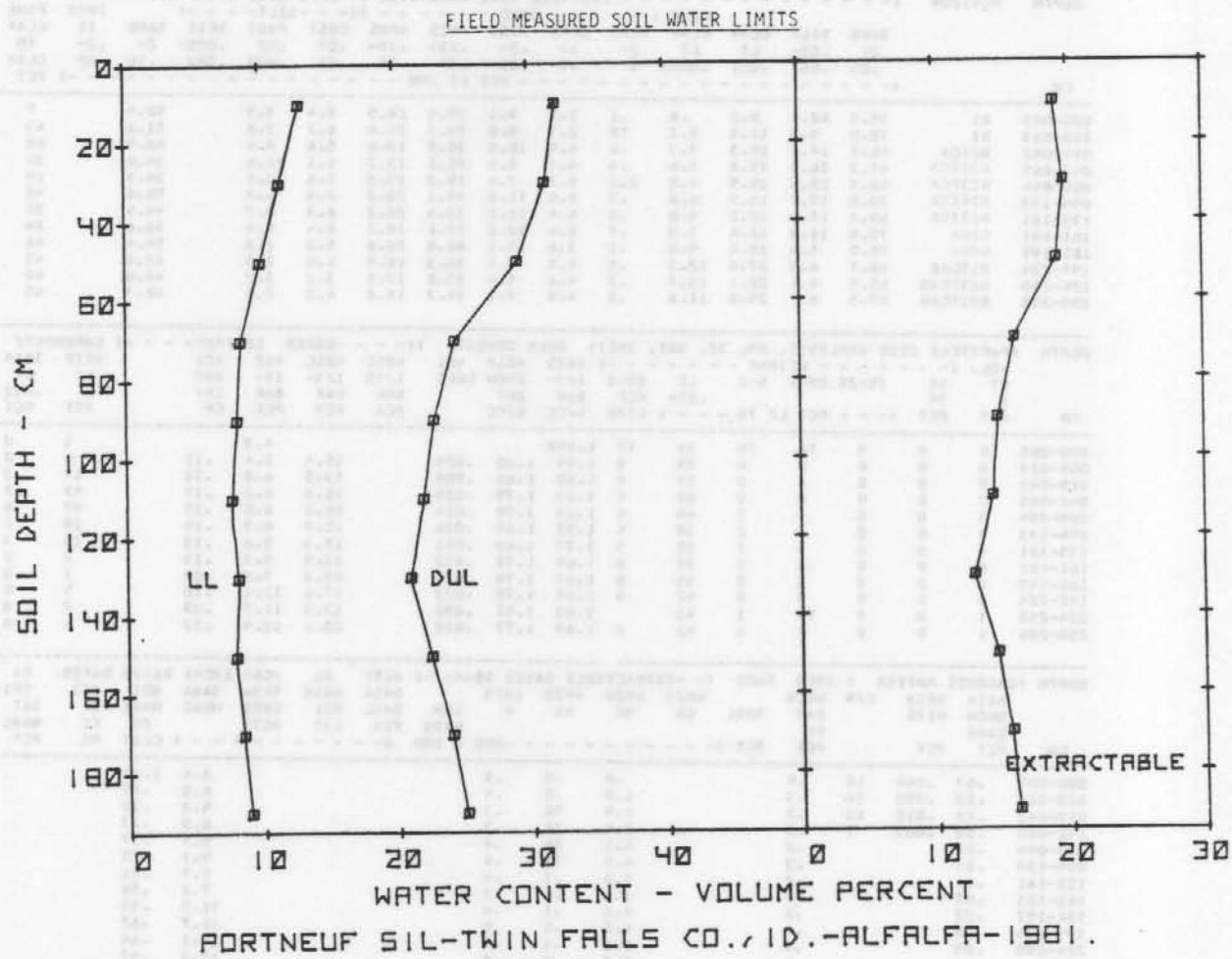
C3 - 137 to 198 cm.; yellowish brown (10YR5/4) silt loam; weak medium platy structure; hard, friable with a few brittle plates; common fine and very fine pores; few dark brown stains; violent effervescence, strongly alkaline; diffuse wavy boundary. (812813).

C4 - 198 to 244 cm.; yellowish brown (10YR5/4) silt loam; massive; hard, friable; violent effervescence, strongly alkaline. (812814).

Remarks: Colors are for moist soil. The degree of cementation in the C1ca horizon is approaching a duripan. The data were not included in the analysis because of incomplete dispersion of sample - silica binding.

Field Measured Soil Water Data Contributed By: J. L. Wright, USDA-AR, Snake River Conservation Research Center, Kimberly, Idaho.

Pedon Number: S81ID-083-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	13.0	32.0	19.0
30	11.5	31.2	19.7
50	10.0	29.1	19.1
70	8.5	24.4	15 9
90	8.2	22.8	14.6
110	7.8	22.0	14.2
130	8.2	21.0	12.8
150	8.0	22.5	14.5
170	8.5	24.0	15.5
190	9.0	25.0	16.0

TOTAL WATER EXTRACTED FROM PROFILE = 32.3 Cm.

SOIL CLASSIFICATION- COARSE-LOAMY, MIXED, THERMIC ARIDIC HAPLUSTALF

SERIES - - - - - - -POSEY VARIANT

SOIL NO - - - - - - S75TX-17-3 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760260-760271

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DECEMBER 1976

DEPTH	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1P - SAND										SILT			INTR	FINE	NON-	BD1
		SAND 2-.05	SILT .05-.002	CLAY LT .0002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	II .2-.02	CLAY TO CLAY	CO3- CLAY	15-BAR TO CLAY
CM		PCT LT 2MM														PCT	PCT	
000-005	A1	78.9	12.9	8.2	.6	.1	3.3	9.1	39.9	26.5	9.4	3.5		52.4		7		.52
005-019	B1	78.8	9.3	11.9	5.1	TR	2.7	8.8	39.7	27.6	6.7	2.6		51.2		43	12	.45
019-042	B2TCA	66.5	14.2	19.3	7.7	.6	4.9	10.9	30.5	19.6	5.6	8.6		46.9		40	16	.35
042-065	B22TCA	47.7	26.5	25.8	5.4	.4	4.1	8.4	21.1	13.7	5.1	21.4		34.0		21	11	.24
065-094	B23TCA	48.3	25.8	25.9	4.8	2.2	5.7	7.4	19.2	13.8	5.6	20.2		34.5		19	10	.23
094-133	B24TCA	70.8	12.7	16.5	6.6	.3	4.6	11.6	34.1	20.2	6.4	6.3		50.6		40	15	.39
133-161	B25TCA	69.7	15.1	15.2	4.8	.3	4.4	11.2	33.6	20.2	6.4	8.7		49.5		32	12	.37
161-181	C1CA	75.8	11.8	12.4	3.0	.7	5.6	12.2	38.1	19.2	6.4	5.4		56.6		24	10	.43
181-197	C2CA	75.0	5.4	19.6	9.0	.1	3.6	10.1	40.6	20.6	4.2	1.2		54.4		46	20	.40
197-224	B1TCAB	66.7	6.3	27.0	12.2	.4	4.0	9.1	36.3	16.9	4.0	2.3		49.8		45	27	.41
224-250	B21TCAB	65.5	6.4	28.1	13.7	.7	4.1	9.4	33.8	17.5	3.2	3.2		48.0		49	28	.42
250-286	B22TCAB	67.5	6.7	25.8	11.6	.5	4.0	9.1	34.7	19.2	4.2	2.5		48.3		45	26	.42

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2	GT 75	75-20	20-5	5-2	LT .074	WEIGHT 20-2	BULK DENSITY 4A1D 1/3-BAR	4A1H OVEN DRY	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR	4B1C 1/3-BAR	4B2 15-BAR	4C1 WRD	CARBONATE 6E1B LT 2	3A1A LT .002	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
CM	PCT	PCT	PCT LT 75				LT20	G/CC	G/CC		BAR PCT	BAR PCT	BAR PCT	CM/ CM	PCT	PCT		
000-005	TR	0	0	TR	TR	34	TR	1.50A					4.3		1	0	8.1	7.6
005-019	0	0	0	0	0	35	0	1.49	1.60	.024		15.4	5.4	.15	6	0	8.1	7.7
019-042	0	0	0	0	0	59	0	1.60	1.64	.008		13.5	6.8	.11	14	3	8.2	7.7
042-065	0	0	0	0	0	60	0	1.63	1.75	.024		16.6	6.2	.17	43	15	8.1	7.9
065-094	5	0	0	4	2	40	6	1.65	1.78	.024		15.0	6.0	.15	47	16	8.3	7.8
094-133	3	0	0	2	2	38	4	1.59	1.69	.020		15.9	6.5	.15	10	2	8.3	7.9
133-161	4	0	0	4	1	38	5	1.77	1.83	.011		13.3	5.6	.13	15	3	8.3	7.8
161-181	0	0	0	0	0	35	0	1.69	1.75	.012		12.9	5.3	.13	9	2	8.2	7.8
181-197	0	0	0	0	0	35	0	1.67	1.78	.022		13.3	7.8	.09	1	0	8.1	7.8
197-224	0	0	0	0	0	42	0	1.59	1.70	.023		17.6	11.1	.10	5	0	8.1	7.7
224-250	1	0	0	TR	1	42		1.65	1.91	.050		13.3	11.7	.03	7	0	7.8	7.6
250-286	1	0	0	1	1	42	2	1.63	1.77	.028		18.1	10.9	.12	4	0	8.1	7.7

DEPTH	(ORGANIC MATTER) 6A1A ORGN CARB	6B1A NITG	C/N	IRON 6C2B EXT FE	PHOS TOTL	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TC MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
CM	PCT	PCT		PCT	PCT	MEQ / 100 G													
000-005	.67	.064	10	.4			.8	.0	.5						8.4	1.02			
005-019	.52	.050	10	.3			1.0	.0	.4						8.0	.67			
019-042	.15	.015	10	.2			1.9	TR	.3						5.8	.30			
042-065	.06	.009	7	.2			2.9	TR	.3						6.9	.27			
065-094	.01			.2			4.4	TR	.4						9.7	.37			
094-133	.01			.3			4.5	TR	.4						9.1	.55			
133-161	.04			.2			4.0	.1	.4						7.7	.51			
161-181	.05			.2			3.8	.1	.3						7.2	.58			
181-197	.02			.3			4.6	.1	.6						11.5	.59			
197-224	.04			.3			6.8	.1	.8						16.7	.62			
224-250	.03			.3			6.6	.1	.9						18.1	.64			
250-286	.02			.4			5.7	.0	.8						17.2	.67			

DEPTH	(SATURATED PASTE) 8E1 REST OHM-	8C1B PH	8A H2O	NA 5D2 ESP	NA 5E SAR	SALT 8D5 TOTL SCLU	GYP 6F1A	(SATURATION EXTRACT 8A1) 8A1A EC	6N1B CA	6Q1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SC4	6M1A NO3	ATTERBERG 4F1 LQID LMIT	4F2 PLST INDX
CM	CM		PCT	PCT		PPM	PCT	MMHOS/ CM	MEQ / LITER									PCT	
000-005																			
005-019																			
019-042																			
042-065																			
065-094																			
094-133	4100	7.9	31.5					.32											
133-161																			
161-181																			
181-197																			
197-224																			
224-250																			
250-286																			

CLAY MINERALOGY (7A2C).
019-42 CA3 MM2 MI2 KK1.
181-197 MT3 MI3 KK2 QZ1 FD1 CA1.
250-286 MT4 MI3 KK2 MC1 QZ1 CA1.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE CA = CALCITE QZ = QUARTZ MM = MONTMORILLONITE-MICA
MC = MONTMORILLONITE-CHLORITE FD = FELDSPAR.

SAND MINERALOGY (7B1) PLACEMENT: MIXED.
019-42 VFNS - RE58 QZ57 FE1 TM ZR SP CB31 FD10 GN EP AU HN. FNES - QZ65 CD1 CB30 FK4 (340 GRAINS).
181-197 VFNS - RE84 QZ82 FE1 ZR1 TM SP FD14 CB1 MS VR GN HN.
250-286 VFNS - RE87 QZ86 FE1 TM ZR FD9 CB3 HN GN AU.
COMMENTS: WEIGHTED AVERAGE OF 64 PCT. RESISTANT MINERALS IN THE B2TCA. WEIGHTED AVERAGE OF 91 PCT. RESISTANT MINERALS IN THE B2TCA ON A CARBONATE-FREE BASE. PEDON SILICEOUS ON CARBONATE-FREE BASE.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS EP = EPIDOTE FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE QZ = QUARTZ
TM = TOURMALINE ZR = ZIRCON FK = POTASSIUM FELDSPAR CB = CARBONATE AGGREGATES CD = CHALCEDONY
GN = GARNET AU = AUGITE SP = SPHENE VR = VERMICULITE.

(A) ESTIMATED

Series: Posey Variant[1/].

Pedon Number: S75TX-17-3

Classification: Coarse-loamy, mixed, thermic Aridic Haplustalfs[1/].According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 0.5 mile north on Farm Road 1731 from its intersection with Farm Road 746. Site is 49 meters west of road in native pasture. (Soil Moisture Site #3).

Use and Vegetation: Rangeland - a blue grama, soapweed community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1200 meters.

Drainage and Permeability:

Water Table and Duration: Well drained and moderately permeable.

Slope: About 1 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff.

Sampled By: D. Blackstock and G. Threlkeld Date: 10-14-75

A1 - 0 to 5 cm.; brown (7.5YR5/3 dry) or dark brown (7.5YR3.5/3 moist) loamy fine sand; weak fine and very fine crumb; soft, very friable; few roots except under grass clumps, where roots are common; effervesces strongly; moderately alkaline; clear smooth boundary. (760260).

B1 - 5 to 19 cm.; brown (7.5YR5/3 dry) or dark brown (7.5YR3.5/3 moist) with a few parts slightly redder and lighter in color; fine sandy loam; massive; slightly hard, friable; few roots; few carbonate nodules, 1/3 to 3 cm. diameter, most are indurated and thinly stained with brown fine earth; effervesces strongly; moderately alkaline; clear wavy boundary. (760261).

B21tca - 19 to 42 cm.; dominantly yellowish red (5YR5/6 dry, 4/6 moist) with smaller amounts of 5YR6/6 dry, 5/6 moist, and 5YR8/4 dry, 7/4 moist; heavy sandy clay loam; weak medium and coarse subangular blocky structure; very hard, firm; few roots; common carbonate filaments and nodules; reddish brown parts effervesce weakly, rest effervesce strongly; moderately alkaline; clear wavy boundary. (760262).

B22tca - 42 to 65 cm.; pink (7.5YR9/4 dry; 8/4 moist) sandy clay loam; weak medium and coarse subangular blocky structure; hard and very hard, with some nodules, 1-3 cm. diameter, extremely hard and indurated; most parts firm; a few friable and some extremely firm; very few fine roots; effervesces strongly; moderately alkaline; clear wavy boundary. (760263).

B23tca - 65 to 94 cm.; dominantly pink (7.5YR9/4 dry, 8/4 moist) with small amount of 7.5YR6/4 dry, 7.5YR5/4 moist; fine sandy loam; weak medium and coarse subangular blocky structure; mostly hard and very hard, most parts firm, a few friable, and a few extremely hard and indurated nodules; effervesces strongly; moderately alkaline; clear wavy boundary. (760264).

B24tca - 94 to 133 cm.; dominantly light brown (7.5YR6/4 dry) or brown (7.5YR5/4 moist) with lesser amount of 7.5YR9/4 dry, 7.5YR moist; fine sandy loam; weak medium and coarse subangular blocky structure; light brown material is very hard, friable; no roots; vertical cylindroids, 1-3 cm. diameter, extend through this horizon and into the underlying horizon, at horizontal intervals of 2-6 cm.; most are extremely hard and indurated; effervesces strongly; moderately alkaline; clear wavy bounary. (760265).

B25tca - 133 to 161 cm.; dominantly light reddish brown (5YR6/4 dry) or yellowish red (5YR5/6 moist) fine sandy loam; weak coarse subangular blocky structure; most parts hard and very hard, friable, some carbonate nodules indurated; no roots; most nodules in cylindroidal form, 2-3 cm. thick, extending vertically through the horizon; effervesces strongly; moderately alkaline; clear wavy boundary. (760266).

C1ca - 161 to 181 cm.; dominantly pink (7.5YR7/4 dry) or light brown (7.5YR6/4 moist) fine sandy loam, with smaller amount 7.5YR8/3 dry, 7.5YR6/4 moist, massive; very hard and hard, firm; no roots; effervesces strongly; moderately alkaline; clear wavy boundary. (760267).

C2ca - 181 to 197 cm.; an irregularly and discontinuously cemented horizon, white (10YR9/2 dry) or light gray (10YR7/2 moist) and 7.5YR7/4 dry, 7.5YR5/4 moist; commonly consists of upper layer of discontinuous cemented K-fabric, 1-2 cm. thick; a middle layer 3-4 cm. thick of browner low-carbonate fine sandy loam which has discontinuous lenses of carbonate, 1-5 cm. thick; and a layer of irregularly cemented carbonate that rests on the horizon below; most K-fabric extremely hard, extremely firm; no roots; effervesces strongly; moderately alkaline; abrupt smooth boundary. (760268).

B1tcab - 197 to 224 cm.; reddish yellow (5YR6/6 dry) or yellowish red (5YR5/6 moist) sandy clay loam; weak coarse subangular blocky structure; very and extremely hard, friable; no roots; common black spots, 1-2 mm. diameter, on ped faces; few very fine tubular pores; carbonate fillings between prisms descend from the overlying horizon and extend continuously to the bottom of the pit; fillings are about 3-5 mm. thick and easily removed with the knife; noncalcareous; except for fillings between prism faces, which effervesce strongly; moderately alkaline; clear wavy boundary. (760269).

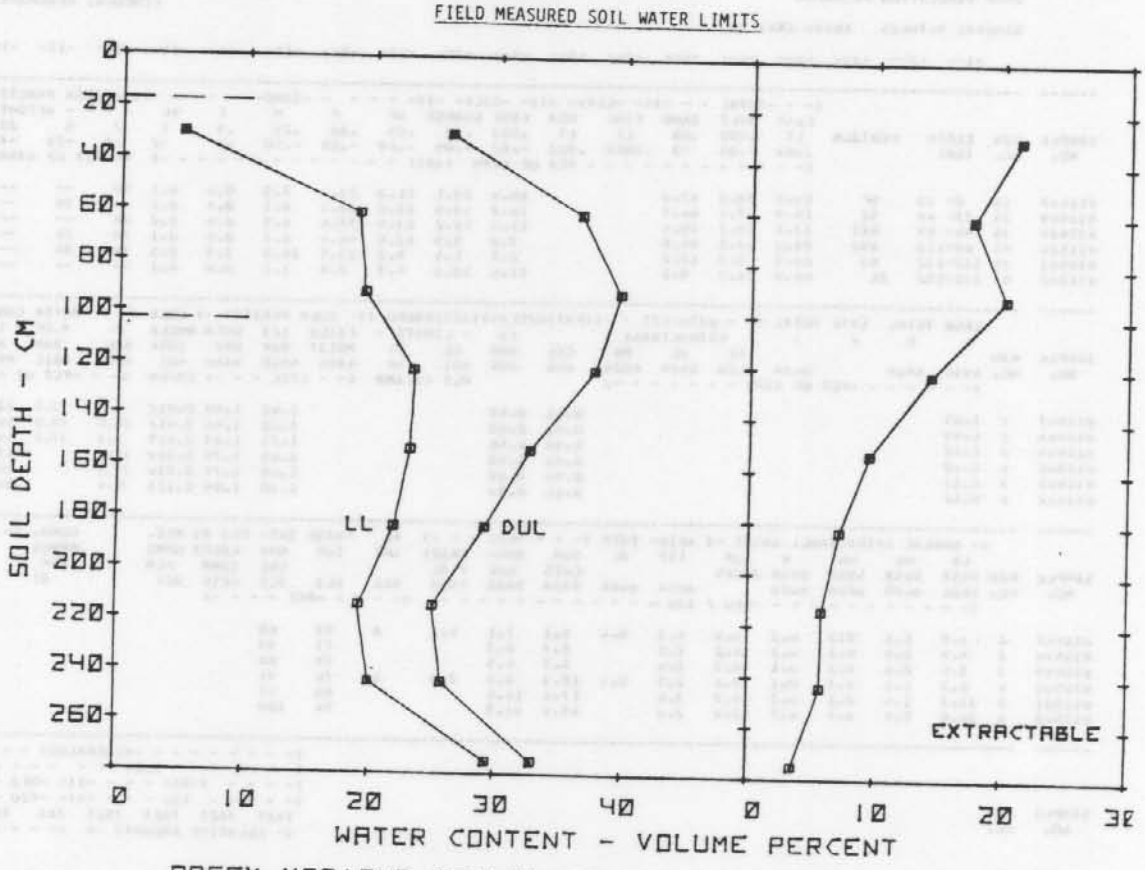
B21tcab - 224 to 250 cm.; dominantly reddish brown (5YR5/4 dry, 4/4 moist) sandy clay loam; with lesser amount 7.5YR9/2 dry, 7/2 moist; weak medium and coarse subangular blocky structure; very hard, friable; common carbonate filaments and nodules, and coatings on prism faces; common black (Mn? Fe?) spots, 1-2 mm. diameter, some of which are faintly coated with carbonate; most parts effervesce strongly, a few effervesce weakly; moderately alkaline; clear wavy boundary. (760270).

B22tcab - 250 to 286 cm.; dominantly reddish yellow (5YR6/6 dry) or yellowish red (5YR4.5/6 moist) sandy clay loam; coarse angular and subangular blocky structure; very and extremely hard, friable; a few carbonate filaments and nodules; few fine tubular pores; common black spots 1-3 mm. diameter; peds have thin carbonate coatings which effervesce strongly; most ped interiors effervesce weakly, some are non-calcareous; moderately alkaline. (760271).

Remarks: 1/ Pedon differs from Posey by having less than 18 percent in the control section and by having a clay decrease with depth beginning at about 65 cm.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-3



POSEY VARIANT-BAILEY CO., TX.-RANGELAND-1976.

SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	4.8	26.1	21.3
61	18.9	36.5	17.6
92	19.4	39.6	20.2
122	23.3	37.6	14.3
153	23.1	32.6	9.5
183	21.9	29.1	7.2
214	19.2	25.1	5.9
244	20.0	25.8	5.8
275	29.4	33.0	3.6

TOTAL WATER EXTRACTED FROM PROFILE = 35.5 Cm.

PRENTISS V

CLASSIFICATION: COARSE-LOAMY, SILICEOUS, THERMIC TYPIC FRAGIUDALF

S 81MS-081 -001 SAMPLE NOS. 81P1497 - 1502 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	WEIGHT 5-20	WEIGHT 20-75	WEIGHT .1-75	(>2MM) WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM(3B1)->				
81P1497	1S	0- 23	AP	14.0	39.0	47.0			18.9	20.1	11.0	28.3	7.0	0.6	0.1	TR	--	--	36	—
81P1498	2S	23- 48	B2	15.9	37.4	46.7			18.8	18.6	11.0	35.1	0.1	0.4	0.1	--	TR	--	36	--
81P1499	3S	48- 69	BX1	12.2	29.2	58.6			15.0	14.2	13.5	37.6	6.9	0.4	0.2	TR	--	--	45	--
81P1500	4S	69-112	BX2	21.2	13.3	65.5			7.8	5.5	12.0	44.4	8.7	0.3	0.1	TR	TR	--	53	TR
81P1501	5S	112-132	B3	28.9	3.9	67.2			2.5	1.4	4.2	33.5	26.5	2.5	0.5	TR	TR	--	63	--
81P1502	6S	132-152	2C	68.9	21.9	9.2			11.6	10.3	4.7	2.9	1.1	0.4	0.1	--	--	--	4	--

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	(RATIO/CLAY) CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
81P1497	1	1.05							0.51	0.43				1.62	1.68	0.012	8.8	17.2	12.8	6.0	0.11
81P1498	2	0.49							0.42	0.40				1.60	1.66	0.012	10.0	28.0	16.6	6.3	0.16
81P1499	3	0.12							0.40	0.46				1.75	1.83	0.015	8.3	17.3	14.4	5.6	0.15
81P1500	4	0.10							0.41	0.40				1.65	1.74	0.018	11.9		17.4	8.5	0.15
81P1501	5	0.12							0.50	0.39				1.69	1.77	0.016	15.3		20.3	11.4	0.15
81P1502	6	0.12							0.66	0.38				1.30	1.84	0.123	36.4		36.3	26.1	0.13

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACIDITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	BASE SAT NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- MEQ / 100 G									->	<- PCT		->					
81P1497	1	3.9	0.5	0.2	0.2	4.8	4.3	0.4	9.1	7.1	5.2	8	53	68				4.5	4.9
81P1498	2	4.9	0.8	0.3	0.2	6.2	2.5		8.7	6.7			71	93				5.7	6.2
81P1499	3	3.4	0.6	0.2	0.1	4.3	1.4		5.7	4.9			75	88				5.3	5.7
81P1500	4	6.3	1.1	0.3	0.1	7.8	2.5	0.1	10.3	8.6	7.9	1	76	91				5.0	5.3
81P1501	5	11.7	1.5	0.2	0.2	14.0	3.6		17.6	14.4			80	97				5.9	6.3
81P1502	6	36.0	5.4	0.7	0.7	42.8	2.8		45.6	41.5			94	100				7.3	7.3

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A21	7A21	7A21	7A21	DTA <2U 7A3	7A3	TOT ANL CLAY K2O 6Q3A	7C3 Fe 6C7A
		<- RELATIVE AMOUNTS ->					<- PCT		->
81P1497	1								
81P1498	2	KK 3	VR 2	MI 1		KK30		1.0	7.6
81P1499	3								
81P1500	4								
81P1501	5								
81P1502	6								

FAMILY CONTROL SECTION: DEPTH 23- 48 PCT CLAY 16 PCT .1-75MM 36

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL KK KAOLINITE VR VERMICULITE MI MICA

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Prentiss Variant[1/].

Pedon Number: S81MS-081-1

Classification: Coarse-loamy, siliceous, thermic Typic Fragiudalfs.

Location: Lee County, Mississippi: 450 meters west and 150 meters north of the SE corner Sec. 36, T.10S, R.5E. Site is Treatment 6 - Rep. 5 of F. Whisler's 1980 Ryegrass Conservation Tillage Study at the Verona Agriculture Experiment Station.

Use and Vegetation: Presently in ryegrass - previously cropped to soybeans.

Parent Material: Coastal Plain sediments over clay of the Blackland Prairie.

Region: Contact of MLRA's 133A and 135.

Position: Upland.

Elevation: About 83 meters.

Drainage and Permeability: Moderately well drained, moderately permeable in the upper 48 cm., very slow in the fragipan and underlying clay.

Water Table and Duration: Perched above the fragipan during wet seasons. Free water observed at about 120 cm. when described.

Slope: About 5 percent on a slightly convex midslope.

Sampled and Described By: Larry F. Ratliff and F. Whisler Date: 2-25-81

Ap -- 0 to 23 cm.; brown (10YR4/3) loam; weak fine subangular blocky structure; hard, very friable; many fine roots in upper 5 cm., common fine roots below; common fine and medium pores; very strongly acid; clear smooth boundary. (811497).

B2 -- 23 to 48 cm.; dark yellowish brown (10YR4/4) loam; few fine faint yellowish brown mottles; weak fine and medium subangular blocky structure; very hard, friable; few fine roots and pores; thin patchy clay films on vertical faces of peds; medium acid; gradual wavy boundary. (811498).

Bx1 -- 48 to 69 cm.; mottled reddish brown (5YR4/4) and pale brown (10YR6/3) fine sandy loam; few fine faint light brownish gray mottles; reddish brown parts are compact and brittle in place; moderate medium platy parting to weak medium subangular blocky structure; pale brown parts appear to surround the plates; extremely hard, firm; few fine roots mostly between plates; common fine and medium pores; medium acid; clear smooth boundary. (811499).

Bx2 -- 69 to 112 cm.; mottled light brownish gray (10YR6/2) strong brown (7.5YR5/8) and yellowish red (5YR5/8) sandy clay loam; weak medium subangular blocky structure; very hard, firm; brown and red parts have firm and slightly brittle centers; gray parts are slightly more clayey; few fine roots and pores; strongly acid; gradual wavy boundary. (811500).

B3 -- 112 to 132 cm.; mottled light brownish gray (10YR6/2) light gray (10YR7/2) strong brown (7.5YR5/8) and yellowish red (5YR5/8) sandy clay loam; weak medium subangular blocky structure; very hard, firm; few fine pores; slightly acid; abrupt wavy boundary. (811501).

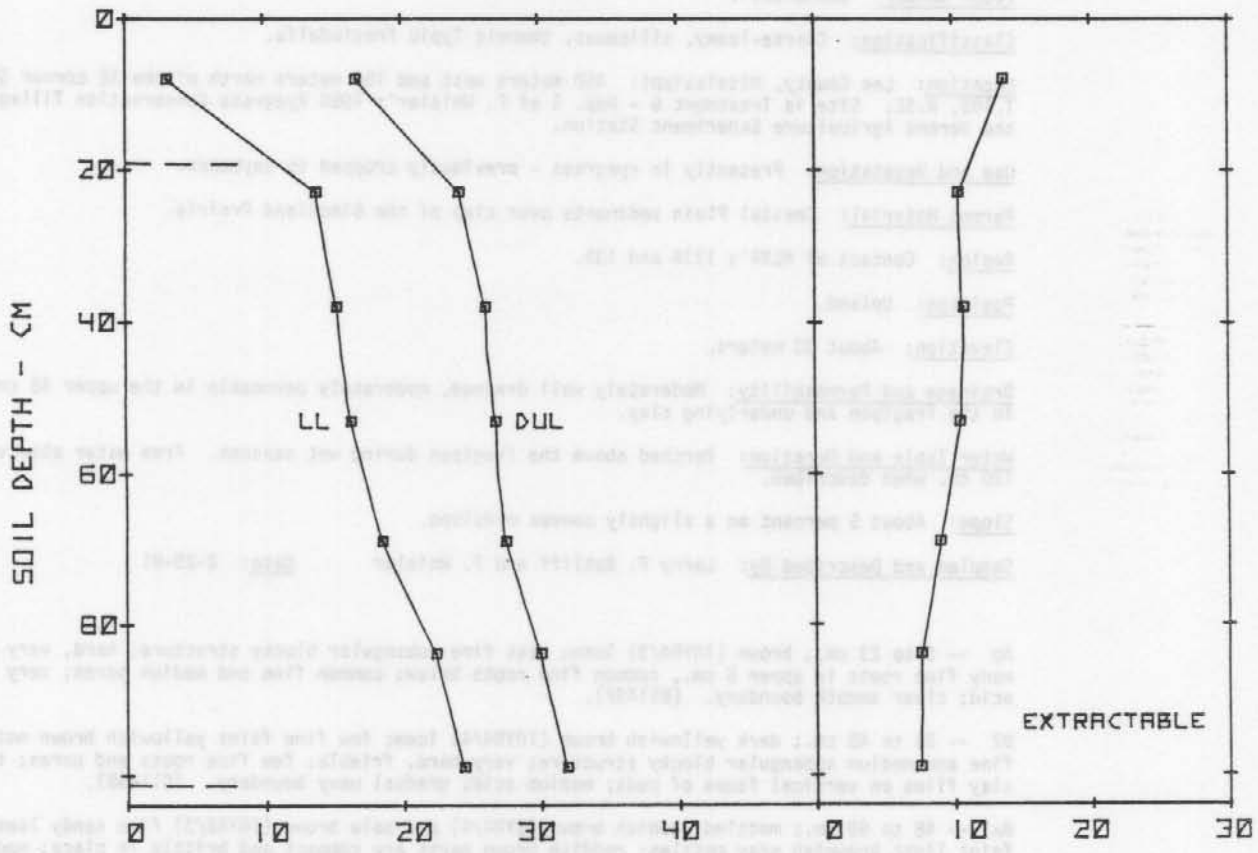
IIC -- 132 to 152 cm.; olive gray (5YR5/2) clay; common fine distinct olive brown (2.5YR4/4) and light olive brown (2.5YR5/4) mottles; massive; extremely hard, extremely firm; common small slickensides; neutral. (811502).

Remarks: Colors are for moist soil. [1/]The soil appears to be forming in a thin coastal plain or old alluvial mantle overlying clayey Cretaceous sediments of the Blackland Prairie. Differs from Prentiss soils by having a clayey IIC horizon and has greater than 35 percent base saturation between 112 and 132 cm.

Field Measured Soil Water Data Contributed By: F. D. Whisler, Dept. of Agronomy and Soils, Mississippi State University.

Pedon Number: S81MS-081-1

FIELD MEASURED SOIL WATER LIMITS



PRENTISS VARIANT L-LEE CO./MS.-SOYBEANS-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
		Volume Percent Water	
8	3.0	16.7	13.7
23	13.8	24.2	10.4
38	15.3	26.1	10.8
53	16.3	26.8	10.5
69	18.5	27.5	9.0
84	22.4	30.0	7.6
99	24.4	31.9	7.5

TOTAL WATER EXTRACTED FROM PROFILE = 10.6 Cm.

PULLMAN

CLASSIFICATION: FINE, MIXED, THERMIC TORRERTIC PALEUSTOLL

S 80TX-375 -001 SAMPLE NOS. 80P1782 - 1789 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

BUSHLAND RESEARCH CENTER, POTTER CO.

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CO3 LT	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGMENTS(MM) WEIGHT 2-5	5-20	20-75	.1-75	>2MM PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
801782	1S	0- 13	AP	32.0	49.7	18.3			18.5	31.2	15.4	2.4	0.4	0.1	TR	--	--	--	3	--
801783	2S	13- 25	B21T	43.1	42.8	14.1			17.9	24.9	12.0	1.8	0.2	0.1	--	--	--	--	2	--
801784	3S	43- 60	B22T	38.4	46.9	14.7			22.4	24.5	12.5	1.8	0.3	0.1	TR	--	--	--	2	--
801785	4S	75- 88	B23T	37.0	44.4	18.6			18.9	25.5	14.8	2.5	0.4	0.4	0.5	TR	--	--	4	TR
801786	5S	100-110	B23T	35.7	40.5	23.8			14.7	25.8	20.1	2.9	0.4	0.2	0.2	TR	TR	--	4	--
801787	6S	132-142	B24TC	42.5	43.1	14.4		24	26.4	16.7	12.3	1.7	0.3	0.1	--	TR	--	--	2	--
801788	7S	163-173	B24TC	35.5	45.0	19.5		13	26.4	18.6	15.6	2.8	0.7	0.3	0.1	TR	--	--	4	TR
801789	8S	193-203	B25TC	35.0	45.5	19.5		3	20.8	24.7	13.1	2.5	1.2	1.1	1.6	3	TR	--	9	3

SAMPLE NO.	HZN NO.	C&GN TOTAL C 6A1C	TOTAL N 6B1B	EXTR TOTAL P 6S1A	S 6K3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	WATER CONTENT 15 BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
801782	1	C.84							0.65	0.37				1.30		15.7				11.7	
801783	2	0.80								0.39				1.45	1.80	0.075	23.3		26.5	16.9	0.14
801784	3	C.47							0.67	0.40				1.53	1.83	0.062	22.0		23.6	15.5	0.12
801785	4	C.37								0.38				1.46	1.70	0.052	19.3		23.4	14.1	0.14
801786	5	C.23								0.41				1.27	1.39	0.031	19.9		25.1	14.5	0.13
801787	6	C.21							0.27	0.26				1.14	1.24	0.028	21.3		26.1	10.9	0.17
801788	7	C.17								0.31				1.47	1.59	0.026	18.2		21.2	11.1	0.15
801789	8	0.12								0.38				1.42	1.59	0.038	19.0		22.9	13.4	0.13

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A 6A2E	MG 5B4A 6A2D	NA 5B4A 6P2B	K 5B4A 6Q2B	SUM BASES	ACID- ITY 6H2B	EXTR AL 6G1E	CEC SUM CATS 5A3A	NH4- OAC 5A8A	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1E	H2O 1:2 1:1 8C1A
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->										<- - - - -PCT - - - ->							
801782	1	16.7	3.9	0.1	1.3	22.0	2.8		24.8	20.9			89	100	--			7.0	7.5
801783	2														--			6.7	6.9
801784	3		8.6	0.8	0.9					25.6					2			7.9	8.1
801785	4														2			8.0	8.3
801786	5														2			8.1	8.1
801787	6		4.6	1.7	0.3					11.3					45			7.9	7.9
801788	7														34			8.0	8.1
801789	8														19			8.0	8.1

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2B	7A2B	7A2B	7A2B	DTA <2U 7A3	7A3	TOT ANL 7C3 CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
801782	1	MI 5	MT 2	KK 2	QZ 1	KK13		2.6	5.3
801783	2								
801784	3	MI 3	MI 3	KK 2		KK14		2.3	5.2
801785	4								
801786	5								
801787	6	CA 3	MT 2	MI 1	KK 1	KK 6		1.2	2.4
801788	7								
801789	8								

FAMILY CONTROL SECTION: DEPTH 15- 65 PCT CLAY 13 PCT .1-75MM 0

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE QZ QUARTZ CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Pullman.

Pedon Number: S80-TX-375-1

Classification: Fine, mixed, thermic Torrertic Paleustolls.

Location: Potter County, Texas: 300 meters south and 75 meters west of the NW corner of Sec. 197. Block 1, plot 1 of W. C. Johnson study - Bushland Research Center.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat and sunflower.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1140 meters.

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: About 0.3 percent. Plane surface.

Sampled and Described By: Larry F. Ratliff and Fred Pringle Date: 6-25-80

Ap - 0 to 13 cm.; brown (7.5YR4/2) silty clay loam, dark brown (7.5YR3/2) moist; weak fine granular and weak fine and medium subangular blocky structure; very hard, friable; few fine roots; common fine pores; mildly alkaline; clear smooth boundary. (801782).

B21t - 13 to 38 cm.; brown (7.5YR4/2) silty clay, dark brown (7.5YR3/2) moist; moderate medium blocky structure; extremely hard, very firm; few fine roots between peds; common fine pores; few fine black concretions; common pressure faces on peds; few small slickensides; thick continuous clay films on faces of peds; neutral; gradual smooth boundary. (801783).

B22t - 38 to 64 cm.; brown (7.5YR4/4) silty clay loam, dark brown (7.5YR3/4) moist; moderate medium blocky structure; extremely hard, very firm; few fine roots between peds; common fine pores; common pressure faces on peds; common small slickensides; thick continuous clay films on faces of peds; slight effervescence, moderately alkaline; gradual smooth boundary. (801784).

B23t - 64 to 112 cm.; reddish brown (5YR5/4) clay loam, reddish brown (5YR4/4) moist; moderate medium blocky structure; extremely hard, very firm; common fine and medium pores; few pressure faces on peds; thick continuous clay films on faces of peds; few threads and soft masses $CaCO_3$; strong effervescence, moderately alkaline; abrupt wavy boundary. (801785, 786).

B24tca - 112 to 183 cm.; pink (5YR8/4) clay loam, pink (5YR7/4) moist; weak medium subangular blocky structure; very hard, firm; common fine and medium pores; thin patchy clay films on faces of peds; estimated 40 percent by volume $CaCO_3$, 2 to 3 percent concretions which can be broken between fingers; violent effervescence, moderately alkaline; gradual wavy boundary. (801787, 788).

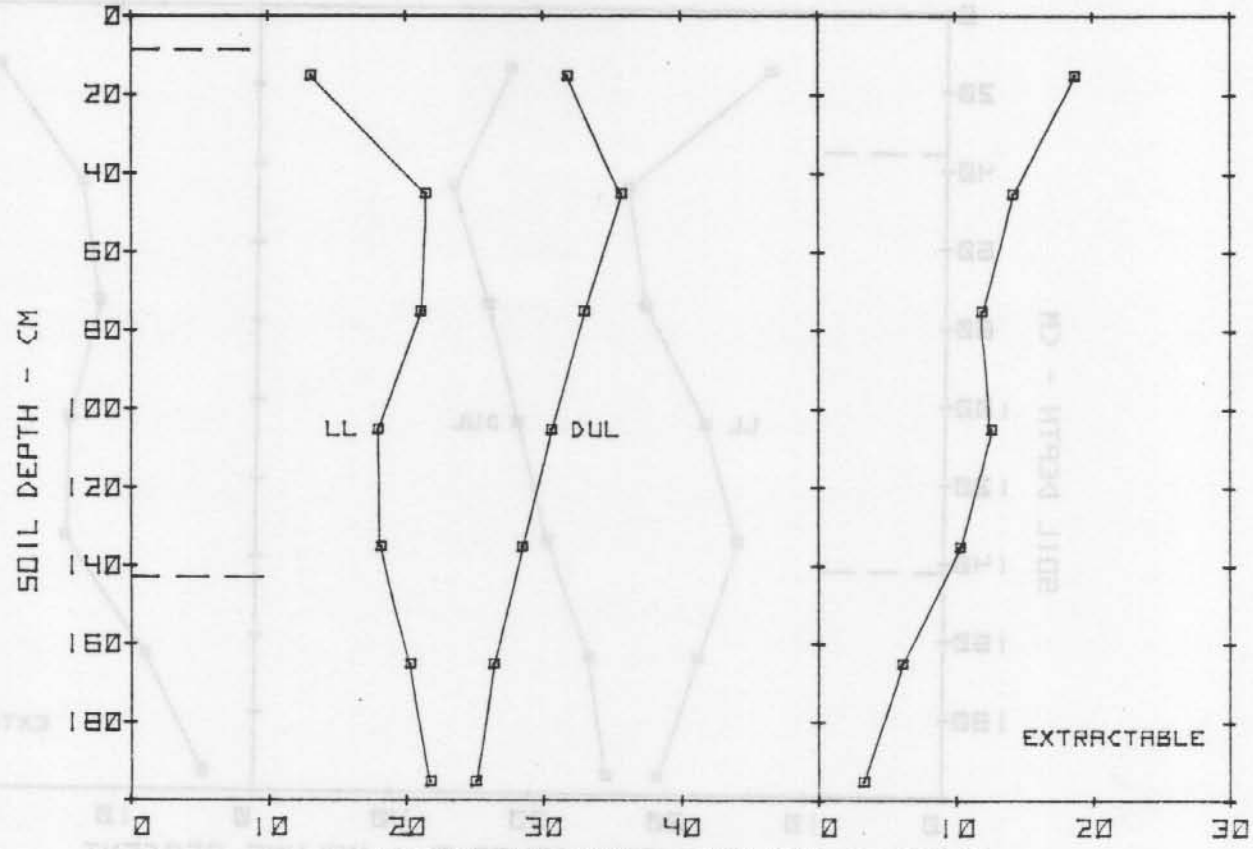
B25tca - 183 to 224 cm.; reddish yellow (5YR6/6) clay loam, yellowish red (5YR5/6) moist; moderate medium subangular blocky structure; very hard, firm; common fine and medium pores; thin continuous clay films on faces of peds; estimated 20 percent by volume $CaCO_3$; violent effervescence, moderately alkaline. (801789).

Remarks: Average rainfall about 46 cm. There is a weakly expressed, discontinuous plow pan about 4 cm. thick at the base of Ap horizon. Few old cracks filled with surface horizon material in the B2t horizons. The upper 5 to 10 cm. of the B24tca horizon is slightly compact and probably restricts root penetration. Area sampled is fallow and roots were difficult to observe. Mineralogy is borderline montmorillonitic to mixed.

Field Measured Soil Water Data Contributed By: W. C. Johnson (retired), USDA-AR, Conservation and Production Research Laboratory, Bushland, Texas.

Pedon Number: S80TX-375-1

FIELD MEASURED SOIL WATER LIMITS



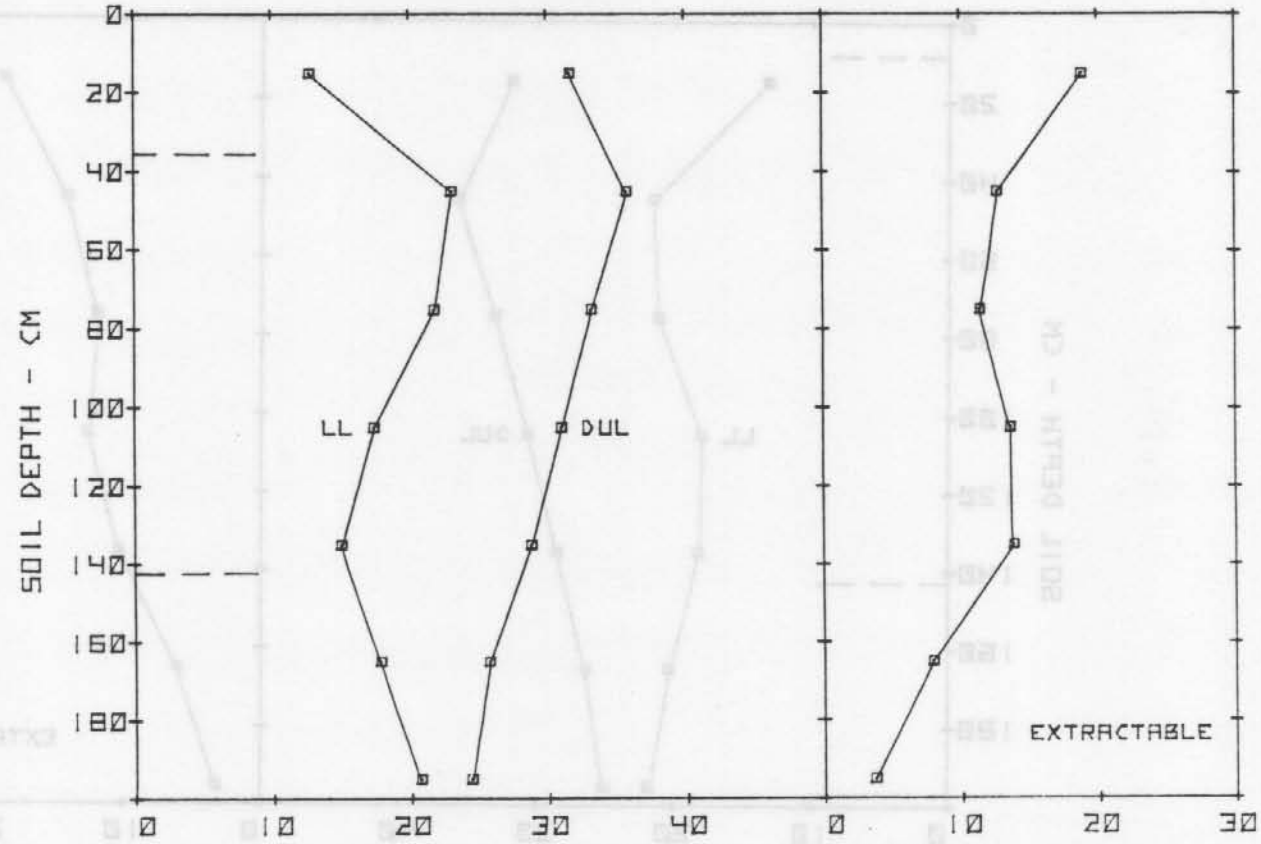
PULLMAN SICL-POTTER CO., TX.-W. WHEAT-1972.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	13.1	31.8	18.7
45	21.5	35.7	14.2
75	21.1	33.0	11.9
105	18.0	30.6	12.6
135	18.2	28.5	10.3
165	20.3	26.4	6.1
195	21.8	25.1	3.3

TOTAL WATER EXTRACTED FROM PROFILE = 23.1 Cm.

Pedon Number: S80TX-375-1

FIELD MEASURED SOIL WATER LIMITS



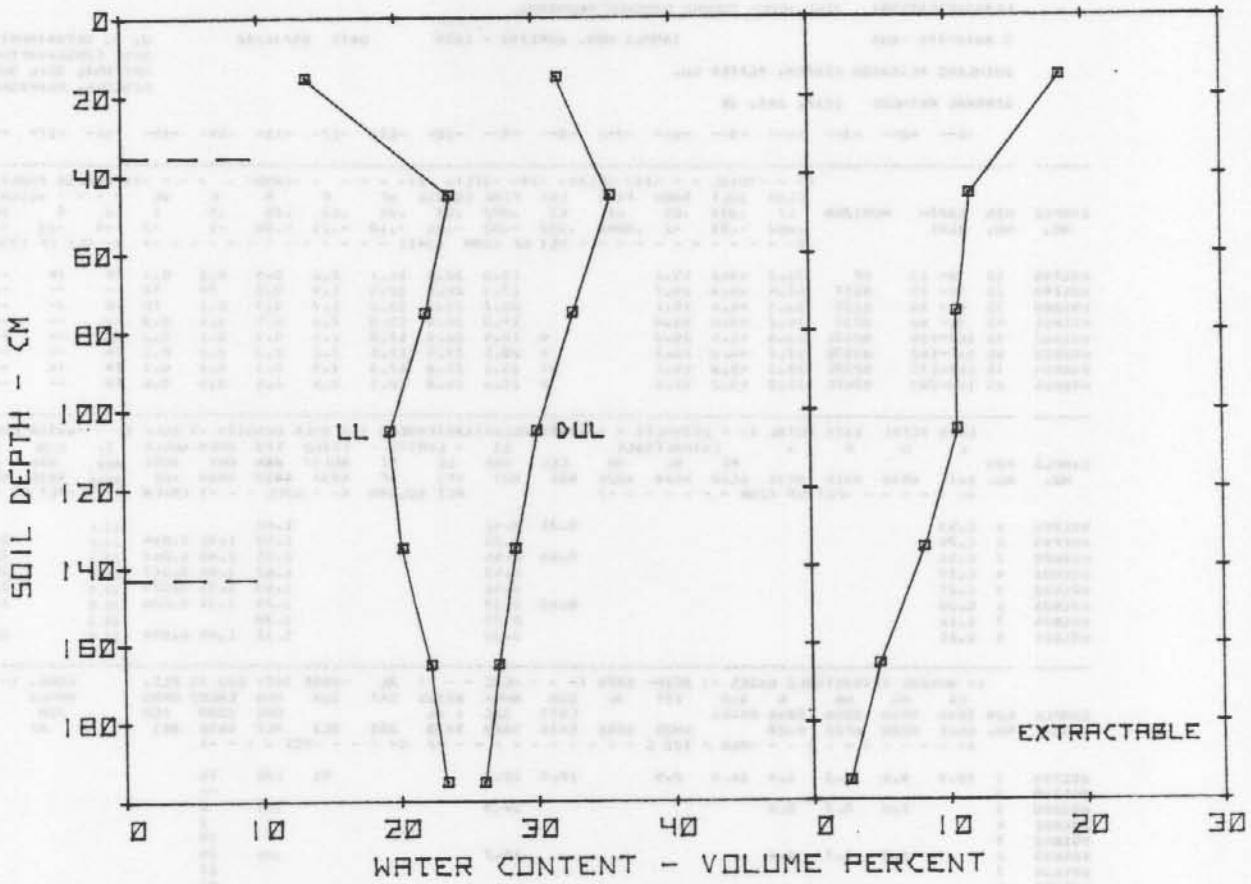
PULLMAN SICL-POTTER CO., TX.-SUNFLOWER-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	12.8	31.7	18.9
45	23.1	35.8	12.7
75	21.8	33.2	11.4
105	17.4	31.0	13.6
135	15.0	28.8	13.8
165	17.8	25.7	7.9
195	20.7	24.4	3.7

TOTAL WATER EXTRACTED FROM PROFILE = 24.6 Cm.

Pedon Number: S80TX-375-1

FIELD MEASURED SOIL WATER LIMITS



PULLMAN SICL-POTTER CO., TX.-GRAIN SORGHUM-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	13.5	31.8	18.3
45	23.9	35.6	11.7
75	22.1	32.8	10.7
105	19.4	30.1	10.7
135	20.3	28.5	8.2
165	22.3	27.2	4.9
195	23.4	26.1	2.7

TOTAL WATER EXTRACTED FROM PROFILE = 20.1 Cm.

PULLMAN

CLASSIFICATION: FINE, MIXED, THERMIC TORRERTIC PALEUSTOLL

S 80TX-375 -003 SAMPLE NOS. 80P1798 - 1805 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

BUSHLAND RESEARCH CENTER, POTTER CO.

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT	TOTAL SILT .002-.05	TOTAL SAND .05-2	FINE CLAY LT .0002	CG3 CLAY .002	FINE SILT .002-.02	COARSE SILT .02-.05	VF SAND .05-.10	F SAND .10-.25	M SAND .25-.5	C SAND .5-1	VC SAND 1-2	>2MM WEIGHT 2-5	>2MM WEIGHT 5-20	>2MM WEIGHT 20-75	>2MM WEIGHT .1-75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
801798	1S	0- 13	AP	31.2	49.2	19.6			19.0	30.2	16.1	2.8	0.5	0.1	0.1	TR	TR	--	3	--
801799	2S	15- 25	B21T	41.4	43.9	14.7			17.9	26.0	12.5	1.9	0.3	TR	TR	--	--	--	2	--
801800	3S	41- 56	B22T	38.5	46.4	15.1			20.7	25.7	13.0	1.7	0.3	0.1	TR	TR	--	--	2	--
801801	4S	71- 86	B23T	36.2	45.0	18.8			19.0	26.0	15.0	2.6	0.5	0.4	0.3	--	--	--	4	--
801802	5S	102-114	B24TL	32.6	44.4	20.0		6	18.4	26.0	17.0	2.4	0.3	0.1	0.2	TR	--	--	3	--
801803	6S	132-142	B25TC	37.7	44.0	18.3		8	20.1	23.9	15.5	2.2	0.3	0.2	0.1	TR	--	--	3	--
801804	7S	163-173	B25TC	35.3	45.0	19.7		14	23.2	21.8	17.3	1.9	0.3	0.1	0.1	TR	TR	--	2	TR
801805	8S	193-203	B26TC	32.0	45.2	22.8		8	20.4	24.8	18.3	2.8	0.6	0.5	0.6	TR	--	--	4	TR

SAMPLE NO.	HZN NO.	ORGN TOTAL C	TOTAL N	EXTR TOTAL P	S	DITH-CIT EXTRACTABLE FE	AL	MN	CEC	RATIO/CLAY LS	ATTERBERG LIMITS - LL	PI	BULK DENSITY FIELD MOIST	1/3 BAR	OVEN DRY	COLE WHOLE SOIL	WATER CONTENT 2- 0.06 BAR	0.06 BAR	1/3 BAR	15 BAR	WRD WHOLE SOIL
		<- - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
801798	1	0.93							0.71	0.42				1.40			17.1			13.0	
801799	2	0.79								0.32				1.50	1.91	0.084	21.0		24.2	13.1	0.17
801800	3	0.51							0.68	0.44				1.55	1.86	0.063	23.5		22.3	16.8	0.09
801801	4	0.37								0.45				1.62	1.86	0.047	22.6		20.3	16.2	0.07
801802	5	0.27								0.41				1.43	1.56	0.029	20.9		21.9	14.7	0.10
801803	6	0.20							0.40	0.33				1.29	1.37	0.020	18.8		14.4	12.3	0.09
801804	7	0.16								0.33				1.30			18.3			11.5	
801805	8	0.11								0.39				1.31	1.45	0.034	17.9		20.8	12.5	0.11

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A	MG 5B4A	NA 5B4A	K 5B4A	SUM BASES	ACID-EXTR ITY AL	AL	CEC SUM CATS	CEC NH4-OAC 5A8A	BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CG3 AS CACO3 <2MM 6E1B	RES. GHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1E	PH H2O 8C1A
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->					6H2B	6G1E				<- - - -PCT - - - ->						1:2	1:1
801798	1	19.9	4.4	0.3	1.4	26.0	2.5		28.5	22.0			91	100	TR			7.0	7.4
801799	2														--			7.0	7.3
801800	3		7.8	0.7	0.8					26.0				100	2			7.7	8.2
801801	4														2			7.7	8.4
801802	5														10			7.9	8.3
801803	6		5.0	1.7	0.4					15.2				100	26			7.8	7.8
801804	7														27			7.8	7.9
801805	8														14			7.8	8.1

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A28	7A28	7A28	7A2b	7A3	7A3	TOT CLAY ANL 7C3 K20 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
801798	1	MM 3	MI 2	KK 2	QZ 1	KK 6		2.6	5.1
801799	2								
801800	3	MT 4	MI 3	KK 2	QZ 1	KK11		2.3	5.2
801801	4								
801802	5								
801803	6	MT 2	MI 2	KK 2	CA 2	KK 6		1.8	3.7
801804	7								
801805	8								

FAMILY CONTROL SECTION: DEPTH 15- 65 PCT CLAY 15 PCT .1-75MM 1

ESTIMATED BULK DENSITY FOR LAYER 1, 7,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MM MONT-MICA MI MICA KK KAOLINITE QZ QUARTZ MT MONTMORILL
CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Pullman.

Pedon Number: S80-TX-375-3

Classification: Fine, mixed, thermic Torrertic Paleustolls.

Location: Potter County, Texas: 300 meters south and 75 meters west of the NW corner of Sec. 197. Block 2, plot 10 of W. C. Johnson study - Bushland Research Center.

Use and Vegetation: Fallow - previously cropped to wheat and grain sorghum.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1140 meters.

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: About 0.3 percent - plane surface.

Sampled and Described By: Larry F. Ratliff and F. Pringle Date: 6-25-80

Ap - 0 to 13 cm.; brown (7.5YR4/2) silty clay loam, dark brown (7.5YR3/2) moist; weak fine granular and weak fine and medium subangular blocky structure; very hard, friable; few fine roots and pores; mildly alkaline; clear smooth boundary. (801798).

B21t - 13 to 33 cm.; dark reddish gray (5YR4/2) silty clay, dark reddish brown (5YR3/2) moist; moderate medium blocky structure; extremely hard, very firm; few fine roots mostly between peds; common fine pores; few small slickensides; thick continuous clay films on faces of peds; neutral; gradual smooth boundary. (801799).

B22t - 33 to 66 cm.; brown (7.5YR4/4) silty clay loam, dark brown (7.5YR3/4) moist; moderate medium blocky structure; extremely hard, very firm; few fine roots mostly between peds; common fine pores; few small slickensides; thick continuous clay films on faces of peds; few threads of CaCO3 in lower part; weak effervescence, moderately alkaline; gradual wavy boundary. (801800).

B23t - 66 to 94 cm.; brown (7.5YR5/4) silty clay loam, brown (7.5YR4/4) moist; moderate medium blocky structure; extremely hard, firm; common fine pores; few small slickensides; thick patchy clay films on faces of peds; few threads of CaCO3; strong effervescence, moderately alkaline; gradual wavy boundary. (801801).

B24tca - 94 to 127 cm.; brown (7.5YR5/4) heavy clay loam, brown (7.5YR4/4) moist; moderate fine and medium blocky structure; extremely hard, firm; common fine and medium pores; thin patchy clay films on faces of peds; common soft lumps of CaCO3; strong effervescence, moderately alkaline; clear wavy boundary. (801802).

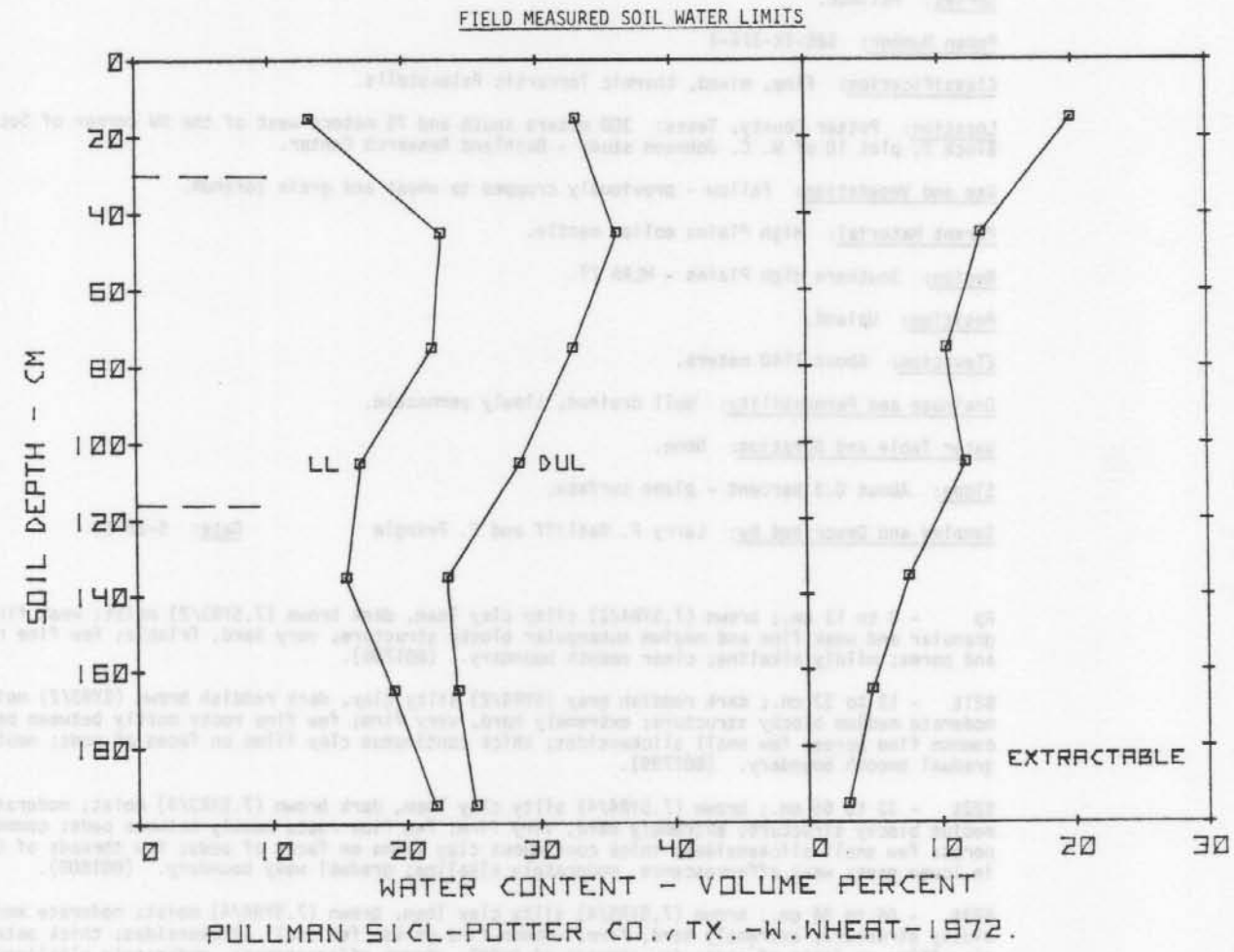
B25tca - 127 to 185 cm.; pink (5YR7/4) silty clay loam, light reddish brown (5YR6/4) moist; weak fine and medium blocky structure; extremely hard, firm; common fine pores; thin patchy clay films on faces of peds; estimated 25 percent by volume of CaCO3 that is irregulary distributed throughout the horizon; violent effervescence, moderately alkaline; gradual wavy boundary. (801803, 804).

B26tca - 185 to 254 cm.; reddish yellow (5YR6/6) clay loam, yellowish red (5YR5/6) moist; moderate medium blocky structure; extremely hard, firm; common fine pores; thin patchy clay films on faces of peds; estimated 15 percent by volume CaCO3; violent effervescence; moderately alkaline. (801805).

Remarks: Differs from Pullman by having slightly less clay in the textural control section and by having mineralogy that is approaching montmorillonitic.

Field Measured Soil Water Data Contributed By: W. C. Johnson (retired), USDA-AR, Conservation and Production Research Laboratory, Bushland, Texas.

Pedon Number: S80TX-375-3

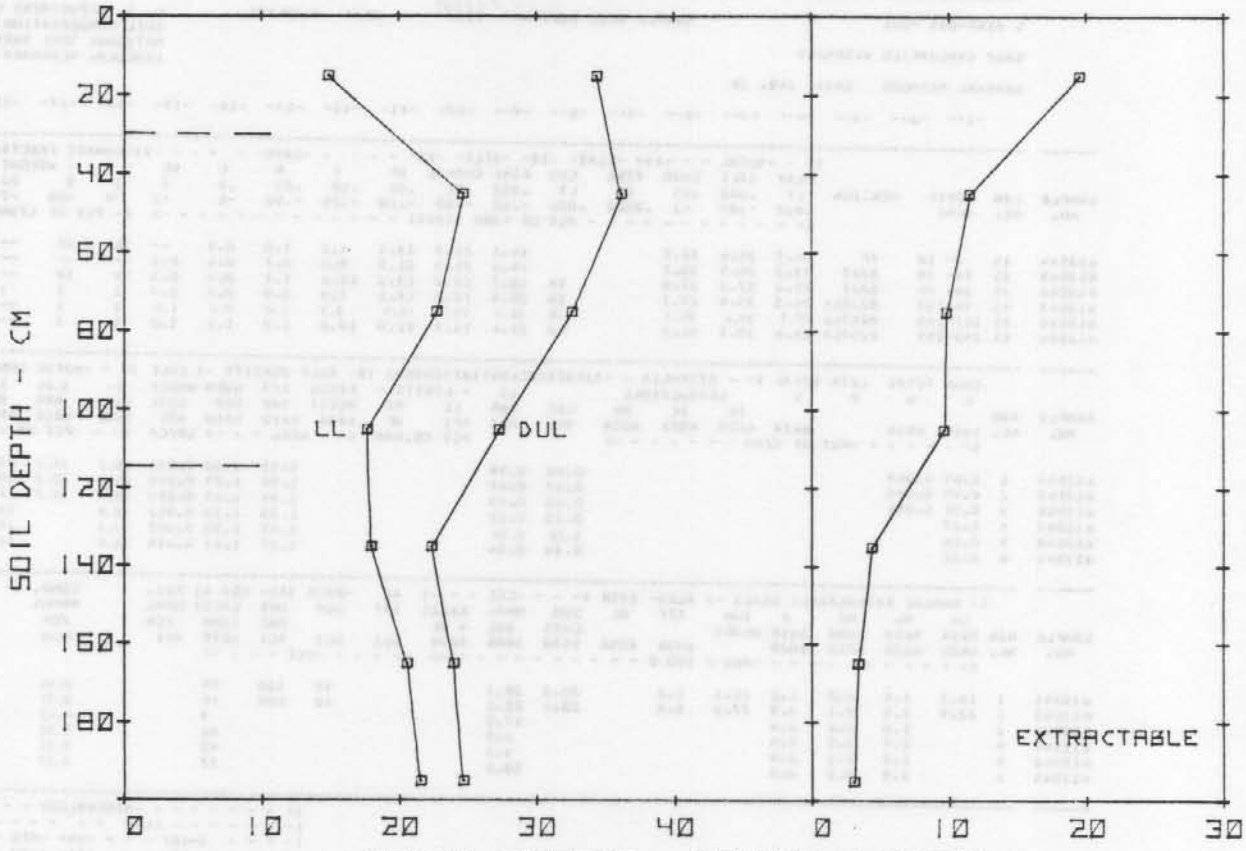


SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	13.0	32.9	19.9
45	22.8	35.9	13.1
75	22.1	32.6	10.5
105	16.7	28.6	11.9
135	15.6	23.2	7.6
165	19.1	23.9	4.8
195	22.2	25.2	3.0

TOTAL WATER EXTRACTED FROM PROFILE = 21.2 Cm.

Pedon Number: S80TX-375-3

FIELD MEASURED SOIL WATER LIMITS



PULLMAN SICL-POTTER CO., TX.-GRAIN SORGHUM-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	14.9	34.4	19.5
45	24.7	36.2	11.5
75	22.8	32.6	9.8
105	17.7	27.3	9.6
135	18.0	22.4	4.4
165	20.6	24.0	3.4
195	21.6	24.7	3.1

TOTAL WATER EXTRACTED FROM PROFILE = 18.4 Cm.

REGION 1

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC USTOLLIC HAPLARGID

S 81AM-004 -001 SAMPLE NOS. 81P3544 - 3549 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	TOTAL FINE .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRAGMENTS(MM) 2-5	COARSE FRAGMENTS(MM) 5-20	COARSE FRAGMENTS(MM) 20-75	>2MM WT .1-75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1)												<- PCT OF <75MM(3B1) ->				
813544	1S	0- 18	AP	30.7	35.6	33.7			14.1	21.5	23.1	9.2	1.0	0.4	--	TR	TR	--	11	TR
813545	2S	18- 38	B21T	33.3	36.5	30.2			14.6	21.9	21.0	8.0	0.7	0.4	0.1	--	--	--	9	--
813546	3S	38- 76	B22T	29.3	32.8	37.9		TR	10.7	22.1	25.0	10.6	1.1	0.9	0.3	TR	TR	--	13	TR
813547	4S	76-107	B23TCA	34.3	33.4	27.3		16	20.9	12.6	17.1	7.9	0.9	0.7	0.7	1	1	3	15	5
813548	5S	107-145	B24TCA	32.3	37.4	30.3		16	24.1	13.3	18.9	8.8	1.0	0.7	1.0	1	1	--	14	2
813549	6S	145-191	B25TCA	29.6	35.1	35.3		13	21.4	13.7	22.0	10.0	1.2	1.1	1.0	1	2	--	16	3

SAMPLE NO.	HZN NO.	ORGN TOTAL C <- PCT OF <2MM -> 6A1C	TOTAL N 6B3A	EXTR TOTAL P	TOTAL S 6H3A	DITH-CIT EXTRACTABLE FE 6G2B	DITH-CIT EXTRACTABLE AL 6G7A	DITH-CIT EXTRACTABLE MN 6G2A	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1 PCT	ATTERBERG LIMITS - PI 4F <0.4MM	BULK DENSITY - FIELD MOIST 4A3A <- G/CC ->	BULK DENSITY - 1/3 BAR 4A1D	BULK DENSITY - OVEN DRY 4A1H	BULK DENSITY - WHOLE SOIL 4D1	COLE CM/CM 4B1A	WATER CONTENT - 0.06 BAR <- PCT OF <2MM -> 4B1C	WATER CONTENT - 1/3 BAR 4B1C	WATER CONTENT - 15 BAR 4B2A	WRD WHOLE SOIL 4C1 <- CM/CM
813544	1	0.65	0.069						0.66	0.44				1.51	1.68	0.036	18.7	24.7	21.1	13.4	0.12
813545	2	0.55	0.069						0.67	0.47				1.54	1.75	0.044	21.4	22.7	20.3	15.8	0.07
813546	3	0.31	0.041						0.60	0.45				1.54	1.63	0.019	18.6	21.7	17.8	13.1	0.07
813547	4	0.27							0.23	0.25				1.33	1.38	0.012	18.8		16.5	10.0	0.08
813548	5	0.16							0.29	0.30				1.47	1.50	0.007	17.3		14.9	9.8	0.07
813549	6	0.12							0.34	0.34				1.37	1.43	0.014	16.4		16.4	10.2	0.08

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A <- MEQ / 100 G -> 6A2E	NH4OAC EXTRACTABLE BASES MG 5B5A 6G2C	NH4OAC EXTRACTABLE BASES NA 5B5A 6P2B	NH4OAC EXTRACTABLE BASES K 5B5A 6Q2B	NH4OAC EXTRACTABLE BASES SUM BASES 6H5A	ACID-ITY 6G9A	EXTR AL 5G1	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SAT SUM 5C3	BASE SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8A3A	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
													<- PCT ->						
813544	1	16.3	3.4	0.2	1.2	21.1	1.2		22.3	20.3			95	100	TR		0.44	7.3	8.0
813545	2	22.9	3.9	0.1	0.9	27.8	0.6		28.4	22.3			98	100	TR		0.35	7.6	8.0
813546	3		3.8	0.1	0.8					17.5					3		0.45	7.9	8.2
813547	4		2.7	0.1	0.4					8.9					46		0.55	7.9	8.2
813548	5		3.2	0.1	0.4					9.3					43		0.51	7.9	8.2
813549	6		3.5	0.2	0.5					10.0					37		0.57	7.9	8.3

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - X-RAY - <2U 7A2I	MINERALOGY - CLAY - DTA - <2U 7A3	MINERALOGY - CLAY - DTA - <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- PCT ->			
813544	1	MT 4	MI 3	KK 3	QZ 1	KK16		2.5	5.4
813545	2								
813546	3	CA 2	MT 2	MI 2	KK 1	KK 6		1.3	2.3
813547	4								
813548	5								
813549	6								

FAMILY CONTROL SECTION: DEPTH 18- 64 PCT CLAY 31 PCT .1-75MM 12

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Redona taxadjunct[1/].

Pedon Number: S81NM-009-1

Classification: Fine-silty, mixed, thermic Ustollic Haplargids[1/].

Location: Curry County, New Mexico: NE 1/4, SW 1/4, Sec. 35, T.5N., R.34E. Site sampled is near Treatment 1, Tube 1 of the 1980 Line Source Experiment conducted by T. W. Sammis on the Plains Branch Experiment Station.

Use and Vegetation: Cropland - presently in corn.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1230 meters.

Drainage and Permeability: Well drained and slowly permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent.

Sampled and Described By: Larry F. Ratliff Date: 7-22-81

Ap - 0 to 18 cm.; dark brown (7.5YR3/4) clay loam; weak fine and medium subangular blocky structure; hard, firm; many fine roots; few pockets of partially decomposed organic residue; moderately alkaline; clear smooth boundary. (813544).

B21t - 19 to 38 cm.; brown (7.5YR4/4) clay loam; moderate medium blocky structure; very hard, very firm; common fine roots; common fine and medium pores; thick continuous clay films on faces of peds; moderately alkaline; gradual smooth boundary. (813545).

B22t - 38 to 76 cm.; strong brown (7.5YR4/6) clay loam; strong medium and coarse blocky structure; very hard, firm; common fine roots mostly between peds; common fine and medium pores; thick continuous clay films on faces of peds; common very fine coatings of white CaCO3 on faces of peds; strong effervescence, moderately alkaline; abrupt wavy boundary. (813546).

B23tca - 76 to 107 cm.; reddish yellow (7.5YR6/6) heavy clay loam; moderate medium blocky structure; hard, friable; common fine roots; many fine, medium and coarse pores; thin patchy clay films on faces of peds and on concretions of CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (813547).

B24tca - 107 to 145 cm.; reddish yellow (5YR6/6) clay loam; moderate medium blocky structure; hard, friable; few fine roots; many fine, medium and coarse pores; thin patchy clay films on faces of peds; about 30 percent by volume of white soft masses and concretions CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (813548).

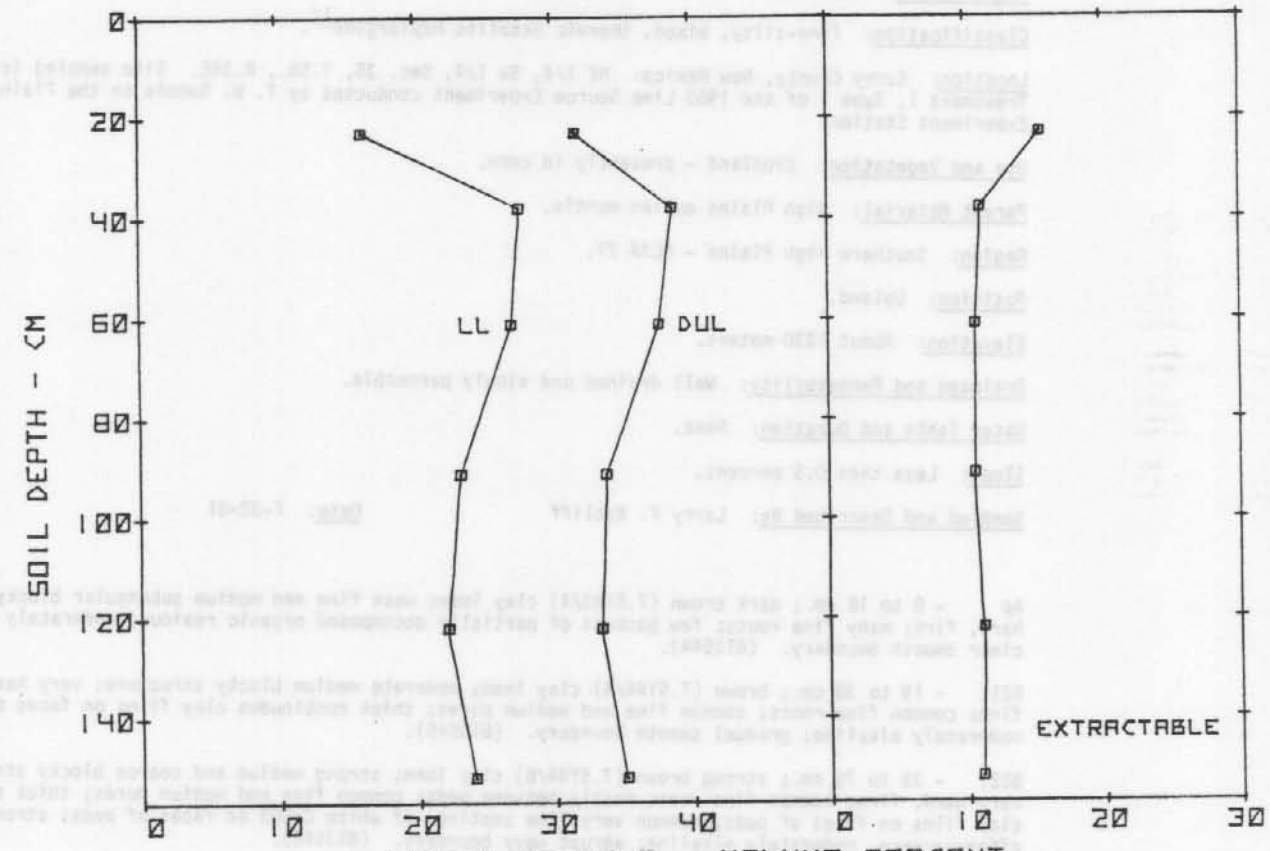
B25tca - 145 to 191 cm.; reddish yellow (5YR6/6) clay loam; weak medium blocky structure; hard, friable; common fine and medium pores; thin patchy clay films on faces of peds; estimated 25 percent by volume of white soft masses and concretions CaCO3; violent effervescence, moderately alkaline. (813549).

Remarks: [1/]Pedon differs from Redona soils by having a fine-silty textural family that is borderline fine-loamy. Field observations of texture and thick clay films suggested an argillic horizon. The observations were not supported by laboratory data. Colors are for moist soil. Laboratory data not received in time for analysis.

Field Measured Soil Water Data Contributed By: T. W. Sammis, Agricultural Engineering Department, New Mexico State University.

Pedon Number: S81NM-009-1

FIELD MEASURED SOIL WATER LIMITS



REDONA TAXADJUNCT-CURRY CO., N.M.-CORN-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
23	16.2	31.7	15.5
38	27.6	38.7	11.1
61	27.0	37.7	10.7
91	23.2	33.8	10.6
122	22.2	33.4	11.2
152	24.1	35.1	11.0

TOTAL WATER EXTRACTED FROM PROFILE = 19.6 Cm.

SAN

CLASSIFICATION: FINE-SILTY, MIXED, THERMIC AQUIC FRAGIUDULT

S 80KY-035 -CC2 SAMPLE NOS. 81P 767 - 771 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2 -5	COARSE FRACTIONS(MM) WEIGHT 5 -20	COARSE FRACTIONS(MM) WEIGHT 20 -75	>2MM WT .1- 75	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1) ->				
81 767	1S	0- 23	AP	14.4	79.2	6.4			43.5	35.8	0.7	1.3	1.4	1.9	1.1	1	2	--	9	3
81 768	2S	23- 46	B21T	21.7	73.7	4.6			43.8	29.9	0.8	1.1	1.1	0.9	0.7	2	TR	--	6	2
81 769	3S	46- 91	B22T	27.5	68.4	4.1			43.1	25.3	0.6	1.0	1.1	0.9	0.3	2	TR	--	5	2
81 770	4S	91-112	B23T	22.9	71.5	5.6			37.7	33.8	1.2	2.0	1.5	0.8	0.1	2	TR	--	6	2
81 771	5S	112-160	BA1	23.6	68.9	7.5			37.5	31.4	1.5	3.3	1.5	0.6	0.6	2	TR	--	8	2

SAMPLE NO.	HZN NO.	CRGN C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S 6R3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	CLAY 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- -PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- -PCT OF <2MM ->				CM/CM
81 767	1	0.89	0.090						0.70	0.52			1.44	1.46	0.005	12.4			22.5	7.5	0.21
81 768	2	0.25	0.044						0.49	0.45			1.46	1.53	0.016	16.9	27.2	25.8	9.7	0.23	
81 769	3	0.17	0.035						0.54	0.46			1.34	1.48	0.033	19.5	29.6	28.3	12.6	0.21	
81 770	4	0.13							0.53	0.45			1.53	1.60	0.015	16.5	24.1	23.6	10.3	0.20	
81 771	5	0.08							0.46	0.44			1.58	1.65	0.019	15.4		19.1	10.3	0.14	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6A2E	MG 5B5A 6D2D	NA 5B5A 6P2B	K 5B5A 6Q2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	CEC NH4- OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 8C1F
		<- -MEQ / 100 G ->												<- -PCT ->				1:2	1:1
81 767	1	9.4	0.5	TR	0.2	10.1	1.4		11.5	10.1			88	100	TR			6.3	6.8		
81 768	2	5.1	0.8	TR	0.2	6.1	6.3	1.6	12.4	10.7	7.7	21	49	57				4.4	4.9		
81 769	3	2.2	2.0	0.1	0.2	5.5	12.4	5.8	17.9	14.9	11.3	51	31	37				4.1	4.5		
81 770	4	1.7	2.3	TR	0.2	4.2	10.3	4.8	14.5	12.1	9.0	53	29	35				4.0	4.5		
81 771	5	1.0	2.7	0.1	0.1	3.9	9.2	4.3	13.1	11.3	8.2	52	30	35				3.9	4.5		

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	DIA <2U 7A3	7A3	TOT ANL CLAY 7C3 K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 767	1	KK 3	VR 3	MI 2	MI 1	KK22		1.2	6.7
81 768	2								
81 769	3								
81 770	4	KK 3	VR 3	MI 2	MI 2	KK23		1.1	6.8
81 771	5								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL KK KAOLINITE VR VERMICULITE MI MONTMORILL MI MICA

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Series Not Designated[1/].

Pedon Number: S80KY-035-2

Classification: Fine-silty, mixed, thermic Aquic **Fragiudults**.

Location: Calloway County, Kentucky: 1.5 miles south on State Highway 893 from its intersection with State Highway 121 in Cherry, then 1.5 miles west on paved county road and 45 meters south in cultivated field.

Use and Vegetation: Cropland - fallow when described - last crop was winter wheat.

Parent Material: Loess over coastal plain sediments.

Region: Southern Mississippi Valley Silty Uplands - MLRA 134.

Position: Upland - slightly concave.

Elevation: ----------

Drainage and Permeability: Somewhat poorly drained, moderately slowly permeable in upper 112 cm., slowly permeable below.

Water Table and Duration: Perched. Observed at about 100 cm. Probably rises to about 50 cm. during wet months. Expected duration from November to May.

Slope: Less than 1 percent.

Sampled and Described By: Larry F. Ratliff and Grant Thomas Date: 11-20-80

Ap -- 0 to 23 cm.; brown (7.5YR4/4) silt loam; weak fine and medium subangular blocky structure; very hard, very friable; common fine and medium roots; few fine Fe-Mn concretions; neutral; clear smooth boundary. (810767).

B21t -- 23 to 46 cm.; yellowish brown (10YR5/4, 5/6) silt loam; weak fine and medium subangular blocky structure; very hard, firm; common fine roots; few fine pores; thin patchy clay films on faces of peds; few Fe-Mn concretions; common medium distinct light brownish gray (10YR6/2) mottles; very strongly acid; gradual wavy boundary. (810768).

B22t -- 46 to 91 cm.; mottled light brownish gray (10YR6/2) and yellowish brown (10YR5/8) silty clay loam; weak medium subangular blocky strucure; very hard, firm; few fine roots and pores; thin patchy clay films on faces of peds; few fine Fe-Mn concretions; very strongly acid; gradual wavy boundary. (810769).

B23t -- 91 to 112 cm.; light brownish gray (10YR6/2) silt loam; weak medium subangular blocky structure; very hard, firm; slightly brittle in lower part; few fine roots and pores; thin patchy clay films on faces of peds; common medium and coarse prominant yellowish brown (10YR5/6, 5/8) mottles; very strongly acid, clear smooth boundary. (810770).

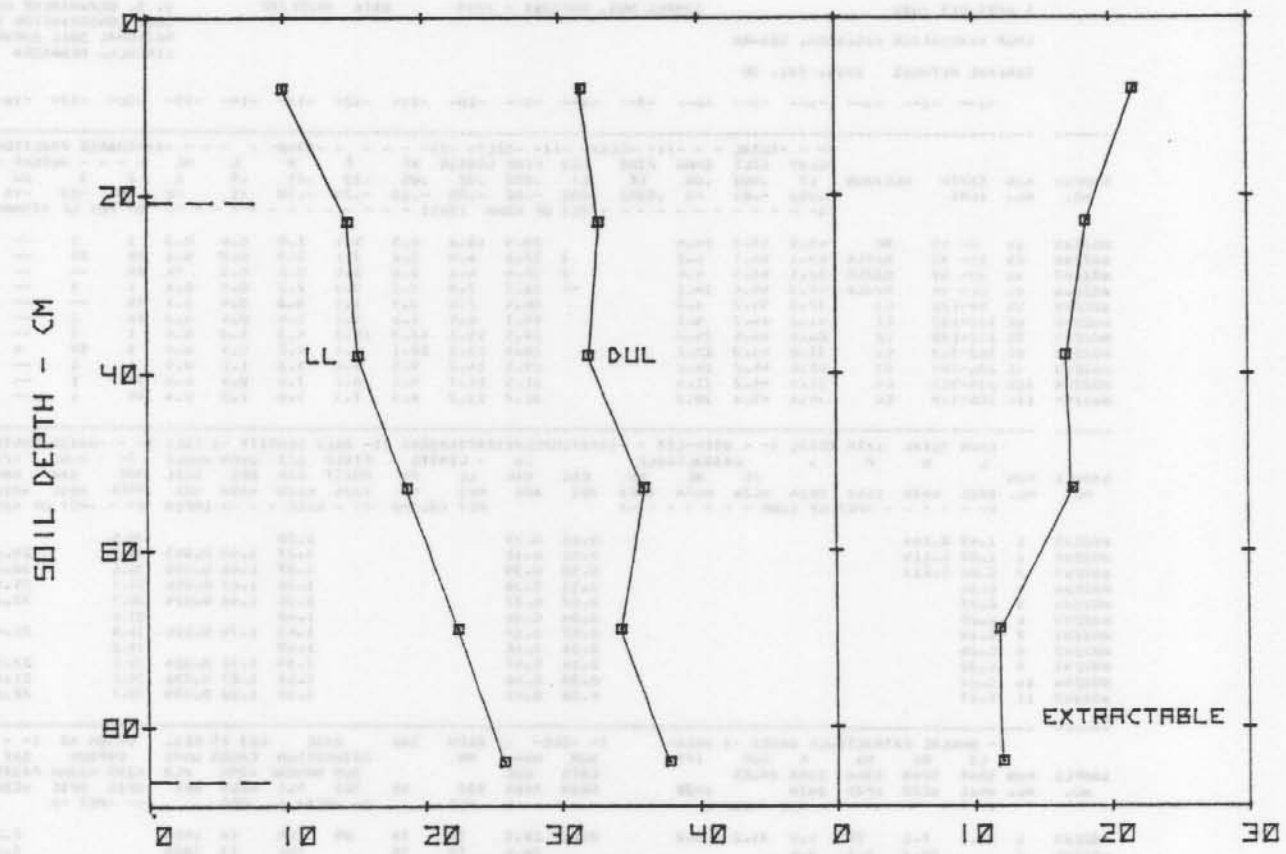
Bx1 -- 112 to 160 cm.; mottled yellowish brown (10YR5/8) and light brownish gray (10YR6/2) silt loam; weak medium platy structure; extremely hard, firm; few coarse pores; brittle brown parts make up about 60 percent of the matrix; gray seams are more silty; very strongly acid. (810771).

Remarks: [1/]Pedon sampled is an inclusion in an area mapped as Grenada sil. Soil is similar to the Calloway series except "glossic" properties are not well expressed, base saturation is slightly low, and depth to the fragipan is greater than allowed in the series. No brittleness was observed in the B2t horizons. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: G. W. Thomas and R. E. Phillips, Department of Agronomy, University of Kentucky.

Pedon Number: S80KY-035-2

FIELD MEASURED SOIL WATER LIMITS



SND-CALLOWAY CO.,KY. - SOYBEANS -1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
8	9.9	31.6	21.7
23	14.6	32.8	18.2
38	15.3	32.0	16.7
53	18.8	36.0	17.2
69	22.5	34.3	11.8
84	25.8	37.8	12.0

TOTAL WATER EXTRACTED FROM PROFILE = 14.9 Cm.

SAO

CLASSIFICATION: FINE, MONTMORILLONITIC, TYPIC CALCIUDOLL

S 80MT-015 -002 SAMPLE NOS. 80P2285 - 2295 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1a, 2A1, 2B

	-1--	-2--	-3--	-4--	-5--	-6--	-7--	-8--	-9--	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-	-18-	-19-	-20-
				(- - -TOTAL - - -)(- -CLAY- -)(- -SILT- -)(- - - - -SAND- - - - -)(-COARSE FRACTIONS(MM)-)(>2MM)																	
SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	CLAY LT .002	SILT .002 -.05	SAND .05 -2	FINE LT .0002	CO3 LT .002	FINE .002 -.02	COARSE .02 -.05	VF .05 -.10	F .10 -.25	M .25 -.50	C .5 -1	VC 1 -2	2 -5	5 -20	20 -75	.1- 75	PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
802285	1S	0- 15	AP	45.9	39.7	14.4			25.9	13.8	6.5	5.1	1.9	0.6	0.3	1	1	--	10	2
802286	2S	15- 33	B21CA	49.1	44.7	6.2		7	37.8	6.9	2.6	2.1	0.9	0.3	0.1	TR	TR	--	3	TR
802287	3S	33- 61	B22CA	52.1	43.5	4.4		3	37.4	6.1	2.0	1.6	0.6	0.2	TR	TR	--	--	2	TR
802288	4S	61- 94	B22CA	41.3	44.6	14.1		--	36.7	7.9	5.2	5.0	2.2	0.9	0.8	1	3	--	13	4
802289	5S	94-122	C1	37.5	59.2	3.3			36.4	2.8	0.9	1.1	0.8	0.4	0.1	TR	--	--	2	TR
802290	6S	122-152	C1	41.2	49.7	9.1			43.3	6.4	3.8	3.2	1.4	0.4	0.3	TR	1	--	6	1
802291	7S	152-183	C2	20.6	44.4	29.0			28.3	16.1	12.5	10.8	4.3	1.0	0.4	1	2	--	19	3
802292	8S	183-213	C2	31.0	43.8	25.2			28.5	15.3	10.1	9.6	4.2	0.9	0.4	1	TR	4	19	5
802293	9S	220-244	C3	31.6	44.2	24.2			29.5	14.7	9.5	9.4	3.8	1.1	0.4	1	1	--	16	2
802294	10S	274-305	C4	31.4	46.2	21.4			31.5	14.7	9.1	8.2	3.4	0.8	0.4	TR	1	--	14	1
802295	11S	305-335	C4	34.8	45.4	20.0			31.7	13.7	8.3	7.3	3.0	1.0	0.4	TR	1	--	13	1

		CRBN TOTAL C	TOTAL N	EXTR TOTAL P	S	(- - DITH-CIT - -) EXTRACTABLE FE	AL	MN	CEC	(RATIO/CLAY) Ca	(ATTERBERG - LIMITS - LL	PI	(- BULK DENSITY -) FIELD MOIST	1/3 BAR	OVEN DRY	COLE WHOLE SOIL	(- - -WATER CONTENT - - -) 2- 0.06 BAR	0.06 BAR	1/3 BAR	15 BAR	WRD WHOLE SOIL
SAMPLE NO.	HZN NO.	6A1C	6B1B	6S1A	6R3A	6G2B	6G7A	6G2A	8D1	8D1	4F1	4F	4A3A	4A1D	4A1M	4D1	4B1A	4B1C	4B1C	4B2	4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT	<0.4MM	<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - - ->				CM/CM
802285	1	1.45	0.144						0.61	0.33				1.20			20.5			15.3	
802286	2	1.09	0.119						0.50	0.32				1.27	1.45	0.045	24.2		29.8	15.9	0.18
802287	3	0.60	0.113						0.50	0.30				1.27	1.46	0.048	24.4		30.8	15.8	0.19
802288	4	0.36							0.51	0.30				1.38	1.63	0.056	21.7		25.4	12.2	0.18
802289	5	0.27							0.57	0.37				1.36	1.48	0.029	28.7		32.2	13.8	0.25
802290	6	0.25							0.54	0.36				1.40			27.0			14.8	
802291	7	0.19							0.57	0.37				1.63	1.76	0.026	16.8		21.4	9.9	0.19
802292	8	0.26							0.56	0.46				1.60			19.0			14.3	
802293	9	0.32							0.56	0.47				1.59	1.71	0.024	19.1		23.5	14.7	0.14
802294	10	0.29							0.59	0.46				1.68	1.87	0.036	20.2		21.0	14.7	0.11
802295	11	0.27							0.56	0.45				1.64	1.82	0.035	20.7		22.2	15.4	0.11

	(- NH4OAC EXTRACTABLE BASES -)					ACID- ITY	(- -CEC- -)		EXCH NA	SAR	BASE SATURATION		CO3 AS CACO3	RES. OHMS	CASO4 AS GYPSUM		(- - - -PH - - -) SAT PASTE	CACL2 .01M	H2O
SAMPLE NO.	HZN NO.	CA 5B4A 6N2E	MG 5B4A 6O2D	NA 5B4A 6P2B	K 5B4A 6Q2B	SUM BASES 6M2B	SUM CATS 5A3A	NH4-OAC 5A6A	5D2	5E	SUM 5C3	NH4OAC 5C1	<2MM 6E1B	/CM 8E1	<2MM 6F1C	<2MM 6F1C	8C1B	8C1E	8C1A
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->							PCT		<- -PCT- ->		PCT		<- -PCT ->			1:2	1:1
802285	1	23.1	7.1	TR	1.0	31.2	3.8		35.0	28.0	TR	TR	89	100	TR	1400		7.0	6.9	7.4
802286	2		10.7	0.1	0.6					24.6	TR	TR		100	13	1800		7.6	7.8	7.9
802287	3		18.8	0.2	0.6					25.8	1	TR		100	11	1700		7.9	7.8	8.3
802288	4		19.0	0.3	0.5					21.2	1	TR		100	8	530	TR	7.0	7.9	7.9
802289	5		23.1	0.8	0.6					21.2	2	1		100	5	510	3	7.7	7.8	7.8
802290	6		22.3	1.4	0.6					22.2	3	2		100	4	440	3	7.7	7.7	7.7
802291	7		14.8	1.7	0.4					15.2	5	3		100	6	460	1	7.8	7.9	7.9
802292	8		17.7	2.5	0.4					17.3	6	5		100	5	430	1	7.6	7.9	7.9
802293	9		18.7	3.5	0.4					17.6	9	6		100	5	410	1	7.7	7.9	7.9
802294	10		19.2	5.0	0.5					18.7	12	8		100	5	330	TR	7.8	8.0	8.1
802295	11		20.1	6.4	0.5					19.5	15	9		100	5	330	TR	7.8	8.0	8.1

	(- - - - - - - - -WATER EXTRACTED FROM SATURATED PASTE- - - - - - - - -)											(- - - - - - - - - -MINERALOGY - - - -)							TOT ANL 7C3 CLAY	
SAMPLE NO.	HZN NO.	CA 6A1B	MG 6Q1B	NA 6P1B	K 6Q1D	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A1A MMHOS /CM	(- - - - - - CLAY - - - - - -) X-RAY 7A2B	7A2B	7A2B	(- -DTA - -) 7A2B	(- -CEC - -) 7A3	7A3	K2O 603A	Fe 607A
		<- - - - - - - - - - - -MEQ / LITER - - - - - - - - - - ->									<- -PCT ->			<- RELATIVE AMOUNTS ->			<- - - - -PCT - - - ->				
802285	1	4.8	2.0	0.3	0.2	--	3.6	0.4	1.9	--	56.8	TR	0.65								
802286	2	3.2	1.6	0.4	0.1	--	2.8	0.3	0.7	--	63.1	TR	0.46	MT 4	MI 3	KK 3	CA 2	KK11		2.2	4.4
802287	3	1.6	2.3	0.5	0.1	--	2.6	0.2	0.7	--	60.4	TR	0.43								
802288	4	24.3	32.7	1.8	0.3	--	1.9	0.4	50.6	--	56.6	0.2	3.00								
802289	5	25.2	26.8	3.2	0.4	--	2.1	TR	50.0	--	65.0	0.2	3.73	MT 4	MI 3	KK 3	QZ 2	KK17		2.5	5.1
802290	6	23.8	38.8	11.2	0.4	--	1.3	0.5	67.0	--	60.3	0.2	4.70								
802291	7	22.3	40.9	19.3	0.4	--	1.3	--	91.3	--	49.3	0.2	5.84								
802292	8	21.4	43.7	20.6	0.6	--	1.5	1.4	92.7	--	54.3	0.3	6.06								
802293	9	21.9	46.3	36.1	0.6	--	1.4	1.7	103.5	1.9	54.6	0.3	6.76	MT 4	MI 3	KK 3	QZ 2	KK15		2.5	5.2
802294	10	17.1	43.3	45.3	0.5	--	1.7	1.9	104.2	--	58.5	0.3	7.05								
802295	11	15.4	46.5	51.7	0.6	--	1.7	2.1	115.0	--	65.4	0.4	7.80								

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 44 PCT .1-75MM 7

ESTIMATED BULK DENSITY FOR LAYER 1, 6, 8,

ANALYSES: 5= ALL OA SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE LA CALCITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Series Not Designated.

Pedon Number: S80MT-015-2

Classification: Fine, montmorillonitic Typic Calciborolls.

Location: Chouteau County, Montana: 30 meters east and 56 meters south of the NW corner of the SW1/4, Sec. 10, T.22N., R.8E.

Use and Vegetation: Cropland - presently in alfalfa (Kane Variety).

Parent Material: Glacial till.

Region: Brown Glaciated Plain - MLRA 52.

Position: Upland terrace.

Elevation: About 990 meters.

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: Less than 1 percent. E-SE aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-14-80

Ap - 0 to 15 cm.; dark brown (10YR3/3) clay, brown (10YR4/3) dry; weak fine and medium subangular blocky structure; slightly hard, friable; many fine roots; mildly alkaline; clear smooth boundary. (802285).

B21ca - 15 to 33 cm.; brown (10YR4/3) silty clay, pale brown (10YR6/3) dry; weak medium prismatic parting to weak medium subangular blocky structure; hard, firm; common fine and medium roots; many fine pores; carbonates are mainly in the form of threads and films on ped faces; violent effervescence, moderately alkaline; gradual smooth boundary. (802286).

B22ca - 33 to 94 cm.; dark grayish brown and grayish brown (2.5YR4/2,5/2) silty clay, grayish brown and brownish gray (2.5Y5/2,6/2) dry; weak medium prismatic parting to weak fine and medium subangular blocky structure; hard, firm; common fine roots mostly between peds; many fine and medium pores; few small pockets of (10YR3/1) clayey material; carbonates are mainly in the form of threads and films on ped faces; violent effervescence, moderately alkaline; clear wavy boundary. (802287, 288).

C1 - 94 to 152 cm.; light olive brown (2.5Y5/4) silty clay loam, pale yellow (2.5Y7/4) dry; massive but parts easily along horizontal planes of weakness about 1.5 cm. apart; hard, very firm; few fine roots concentrated along horizontal planes; few fine threads of CaCO3; few masses of gypsum and iron hydroxides; horizontal bands of (10YR3/1) clayey material from 3 to 5 mm. thick are irregularly distributed throughout the horizon; weak effervescence, moderately alkaline; gradual wavy boundary. (802289, 290).

C2 - 152 to 226 cm.; light olive brown (2.5Y5/4) clay loam, pale yellow (2.5Y7/4) dry; common medium distinct brownish yellow mottles; massive; hard, firm; few fine and medium roots; common fine pores; few small masses of gypsum and lignious material; weak effervescence, moderately alkaline; gradual wavy boundary. (802291, 292).

C3 - 226 to 274 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.5Y5/2) dry; massive; hard, firm; few fine pores; few small masses of gypsum and lignious material; few very thin horizontal bands and pockets of silty material; few small (<1 cm.) silica pebbles; weak effervescence, moderately alkaline; gradual wavy boundary. (802293).

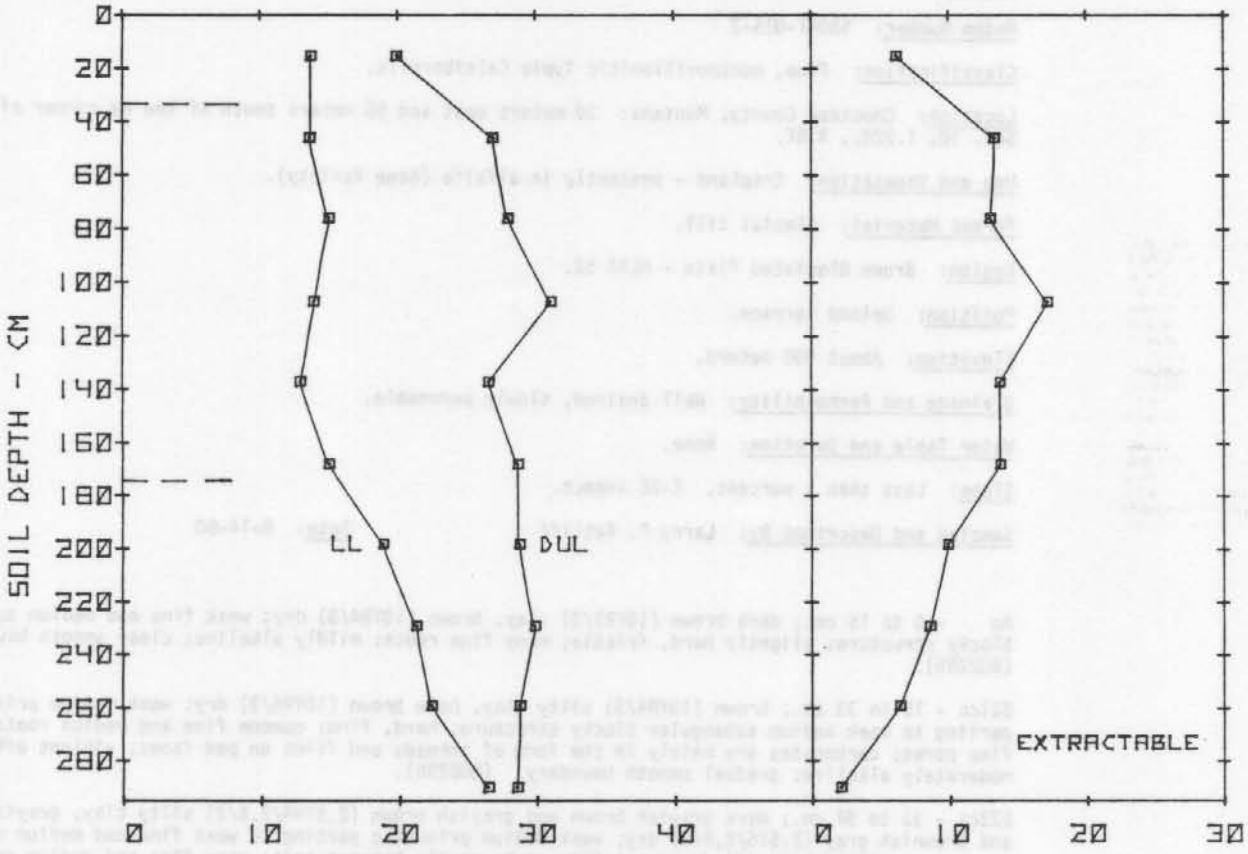
C4 - 274 to 389 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.5Y5/2) dry; massive; very hard, very firm; few fine pores; few small silica pebbles; weak effervescence, moderately alkaline. (802294, 295).

Remarks: The C1 horizon appears to be partially restrictive to roots.

Field Measured Soil Water Data Contributed By: P. L. Brown, USDA-AR, Plant and Soil Science Department, Montana State University.

Pedon Number: S80MT-015-2

FIELD MEASURED SOIL WATER LIMITS



SND-CHOUTEAU CO.,MT.-ALFALFA-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	13.7	19.9	6.2
46	13.6	26.9	13.3
76	15.0	28.0	13.0
107	13.9	31.1	17.2
137	12.9	26.6	13.7
168	15.0	28.7	13.7
198	18.9	28.8	9.9
229	21.3	29.9	8.6
259	22.4	28.8	6.4
290	26.5	28.6	2.1

TOTAL WATER EXTRACTED FROM PROFILE = 31.8 Cm.

SAD

CLASSIFICATION: FINE, MONTMORILLONITIC, CUMULIC HAPLOBOROLL

S 80MT-015 -001 SAMPLE NOS. 80P2273 - 2284 DATE 06/28/82

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	.1-75	>2MM WT PCT OF WHOLE SOIL
				-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-
				<- PCT OF <2MM (3A1)											->	<- PCT OF <75MM(3B1)			->	
802273	1S	0- 15	AP	40.7	41.2	18.1			24.7	16.5	9.0	5.8	2.5	0.6	0.2	TR	1	--	10	1
802274	2S	15- 51	B21T	38.2	40.8	21.0			22.4	18.4	11.5	6.5	2.3	0.5	0.2	TR	TR	--	9	TR
802275	3S	51- 76	B22T	32.0	55.5	12.5			32.4	23.1	7.8	3.2	1.1	0.3	0.1	TR	--	--	5	TR
802276	4S	76-119	B23CA	34.8	55.7	9.5			30.3	25.4	6.3	2.2	0.8	0.1	0.1	TR	--	--	3	--
802277	5S	119-163	B24CA	34.4	56.7	8.9			34.0	22.7	5.4	2.3	0.8	0.2	0.2	TR	1	--	4	1
802278	6S	163-239	C1CA	50.0	45.2	4.8			39.6	5.6	2.0	1.8	0.7	0.2	0.1	TR	--	--	3	--
802279	7S	239-305	C2CA	33.0	43.2	23.8			32.6	10.6	9.5	9.4	3.4	1.0	0.5	1	TR	--	15	1
802280	8S	305-335	C3	24.6	57.6	17.6			39.0	18.6	11.6	4.5	1.3	0.3	0.1	1	1	--	8	2
802281	9S	335-366	C3	27.5	46.2	26.3			30.4	15.8	10.7	9.9	4.1	1.2	0.4	1	--	--	16	1
802282	10S	366-396	C3	33.8	38.2	28.0			25.5	12.7	9.5	10.9	5.1	1.7	0.8	TR	TR	--	18	TR
802283	11S	396-427	C3	30.4	38.5	31.1			25.1	13.4	11.2	12.0	5.9	1.5	0.5	1	2	--	22	3
802284	12S	427-457	C3	30.5	35.8	33.7			22.2	13.6	10.7	13.1	7.1	2.0	0.8	--	--	--	23	--

Column numbers printed across the page: -1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	ORGN C 6A1C	TOTAL N 6B1B	EXTR P 6S1A	TOTAL S 6R3A	CITR-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	BULK DENSITY FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM						->			PCT <0.4MM		<- G/CC		->	CM/CM	<- PCT OF <2MM			->	CM/CM
802273	1	1.42	0.129						0.54	0.32				1.30			18.4			13.0	
802274	2	0.77	0.098						0.56	0.37				1.42	1.67	0.055	19.0		24.0	14.0	0.14
802275	3	0.75	0.082						0.55	0.37				1.39	1.54	0.035	18.4		23.3	11.9	0.16
802276	4	0.58							0.63	0.39				1.49	1.59	0.022	19.7		23.6	13.5	0.15
802277	5	0.40							0.69	0.41				1.54	1.75	0.043	21.0		22.7	14.1	0.13
802278	6	0.35							0.51	0.34				1.44	1.68	0.053	27.3		27.6	17.1	0.15
802279	7	0.27							0.58	0.38				1.38	1.61	0.052	20.3		32.5	12.5	0.27
802280	8	0.30							0.65	0.52				1.48	1.67	0.041	19.8		27.9	12.7	0.22
802281	9	0.34							0.59	0.45				1.50			18.9			12.4	
802282	10	0.26							0.54	0.38				1.52	1.76	0.050	20.1		22.5	12.9	0.15
802283	11	0.30							0.57	0.45				1.50			18.7			13.6	
802284	12	0.27							0.54	0.39				1.50			18.3			11.8	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A 6N2E	MG 5B4A 6O2D	NA 5B4A 6P2B	K 5B4A 6Q2B	SUM BASES	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4OAC 5A6A	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C	<20MM 6F1C	PH SAT PASTE 8C1B	CACL2 .01M 8C1E 1:2	H2O 8C1A 1:1
		<- MEQ / 100 G							->	PCT		<- PCT ->		PCT		<- PCT ->				
802273	1	13.1	6.1	0.2	1.4	20.8	7.0	27.8	22.1			75	94	--					7.0	7.7
802274	2	17.8	7.4	0.1	1.0	26.3	3.0	29.3	22.3	TR	TR	90	100	TR	1700			7.0	7.1	7.3
802275	3		9.8	0.2	0.7				17.7	1	TR		100	4	2100			7.8	7.8	8.0
802276	4		17.0	0.6	0.9				21.9	2	2		100	2	2000			8.0	8.0	8.4
802277	5		20.8	1.9	0.7				23.9	7	5		100	2	1700			8.1	8.1	8.7
802278	6		18.0	2.4	0.5				25.6	8	6		100	8	1500			8.1	7.9	8.4
802279	7		13.4	2.0	0.3				19.1	6	4		100	7	730	--		7.9	7.8	8.2
802280	8		12.8	2.6	0.2				15.9	12	8		100	7	920			8.1	7.9	8.3
802281	9		11.7	2.4	0.3				16.3	9	6		100	6	740			7.8	7.8	8.1
802282	10		13.2	2.5	0.4				18.3	11	7		100	5	690			7.8	7.8	8.1
802283	11		12.6	2.8	0.4				17.4	9	7		100	5	580	--		7.7	7.8	8.0
802284	12		10.9	2.6	0.4				16.5	8	6		100	5	510			7.6	7.7	7.9

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6N1B	MG 6O1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2B	7A2B	7A2E	7A2B	DTA <2U 7A3	7A3	TOT ANL CLAY 7C3 K2O 6Q3A	Fe 6C7A
		<- MEQ / LITER								->	<- PCT	->	/CM	<- RELATIVE AMOUNTS				->		<- PCT	->
802273	1												0.11								
802274	2	4.0	3.0	0.5	0.2	--	4.6	0.1	0.5	0.1	40.6	TR	0.60	MT 4	MI 3	KK 3	QZ 2	KK18		3.1	5.3
802275	3	2.6	2.6	0.6	0.2	--	2.7	0.2	2.1	--	47.4	TR	0.56								
802276	4	1.0	2.1	2.2	0.2	--	3.3	0.1	1.0	--	53.6	TR	0.50								
802277	5	0.6	1.3	4.8	0.1	--	3.2	0.3	1.8	0.1	55.3	TR	0.64	MT 4	MI 3	KK 3	QZ 2	KK17		2.6	5.9
802278	6	0.7	1.1	6.1	0.1	--	3.5	0.1	3.2	--	64.8	TR	0.75								
802279	7	8.9	11.3	14.1	0.2	--	1.6	0.1	34.1	--	55.0	0.1	2.88								
802280	8	4.1	5.0	17.4	0.2	--	2.2	0.8	22.0	--	45.6	0.1	2.52								
802281	9	10.4	4.8	20.0	0.3	--	2.0	--	35.1	--	47.2	0.1	3.42								
802282	10	7.1	6.8	18.2	0.2	--	2.0	1.5	26.3	--	50.6	0.1	2.90	MT 5	MI 3	KK 3	QZ 2	KK22		2.3	6.1
802283	11	12.2	11.4	24.1	0.3	--	1.8	2.5	43.0	1.0	53.0	0.1	3.71								
802284	12	16.7	16.2	25.3	0.4	--	1.7	3.1	47.8	2.2	49.2	0.2	4.44								

FAMILY CONTROL SECTION: DEPTH 15- 65 PCT CLAY 36 PCT .1-75MM 8

ESTIMATED BULK DENSITY FOR LAYER 1, 9, 11, 12.

MMHOS/CM OF 1:2 WATER EXTRACT (8I) FOR LAYERS 1.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Series Not Designated.

Pedon Number: S80MT-015-1

Classification: Fine, montmorillonitic Cumulic Haplaborolls.

Location: Chouteau County, Montana: 30 meters east and 31 meters south of the NW corner of the SW 1/4, Sec. 10, T.22N., R.8E.

Use and Vegetation: Cropland - presently in alfalfa (Beaver Variety).

Parent Material: Glacial till or possibly old alluvium over till.

Region: Brown Glaciated Plain - MLRA 52.

Position: Upland terrace.

Elevation: About 990 meters.

Drainage and Permeability: Well drained, slowly permeable.

Water Table and Duration: None.

Slope: About 1 percent. E-SE aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-13-80

Ap - 0 to 15 cm.; very dark grayish brown (10YR3/2) light silty clay, dark grayish brown (10YR4/2) dry; moderate medium platy structure in upper part, massive in lower part; hard, firm; many fine and medium roots; mildly alkaline; clear smooth boundary. (802273).

B21 - 15 to 51 cm.; very dark grayish brown (10YR3/2) clay loam, dark grayish brown (10YR4/2) dry; strong medium prismatic parting to moderate fine and medium blocky structure; very hard, very firm; common fine and medium roots almost entirely between peds - roots slightly flattened; common fine pores; thin nearly continuous clay films on faces of peds; few pressure faces; moderately alkaline; gradual wavy boundary. (802274).

B22 - 51 to 76 cm.; very dark grayish brown (10YR3.5/2) silty clay loam, grayish brown (10YR5/2) dry; moderate medium prismatic parting to moderate medium blocky structure; very hard, firm; common fine and medium, slightly flattened, roots between peds; common fine and medium pores; thin patchy clay films on faces of peds; common pressure faces; carbonates are finely dispersed but are visible as thin white coatings on vertical faces of peds; strong effervescence, moderately alkaline; clear wavy boundary. (802275).

B23 - 76 to 119 cm.; very dark grayish brown (10YR3/2) silty clay loam, dark grayish brown (10YR4/2) dry; moderate medium prismatic parting to moderate medium blocky structure; very hard, very firm; common fine roots between peds; common fine pores; common pressure faces; many fine threads of CaCO3 throughout but mostly concentrated on vertical prism faces; violent effervescence, moderately alkaline; clear wavy boundary. (802276).

B24ca - 119 to 163 cm.; dark grayish brown and very dark grayish brown (10YR4/2,3/2) silty clay loam, grayish brown and dark grayish brown (10YR5/2,4/2) dry; common fine distinct yellowish brown (10YR5/6) mottles; moderate medium prismatic parting to weak medium blocky structure; very hard, very firm; few fine and medium roots between peds; common fine pores; common pressure faces; many fine threads of CaCO3 mostly concentrated on vertical faces of prisms; violent effervescence, strongly alkaline; gradual wavy boundary. (802277).

C1ca - 163 to 239 cm.; grayish brown and dark grayish brown (10YR5/2,4/2) silty clay, light brownish gray and grayish brown (10YR6/2,5/2) dry; few fine distinct yellowish brown mottles; massive*; hard, firm; few fine and medium roots; common fine pores; common fine threads and soft masses CaCO3; common horizontal bands of (10YR3/2) clayey strata about 5 to 10 mm. thick and 5 to 10 cm. apart are throughout the horizon; violent effervescence, moderately alkaline; gradual wavy boundary. (802278).

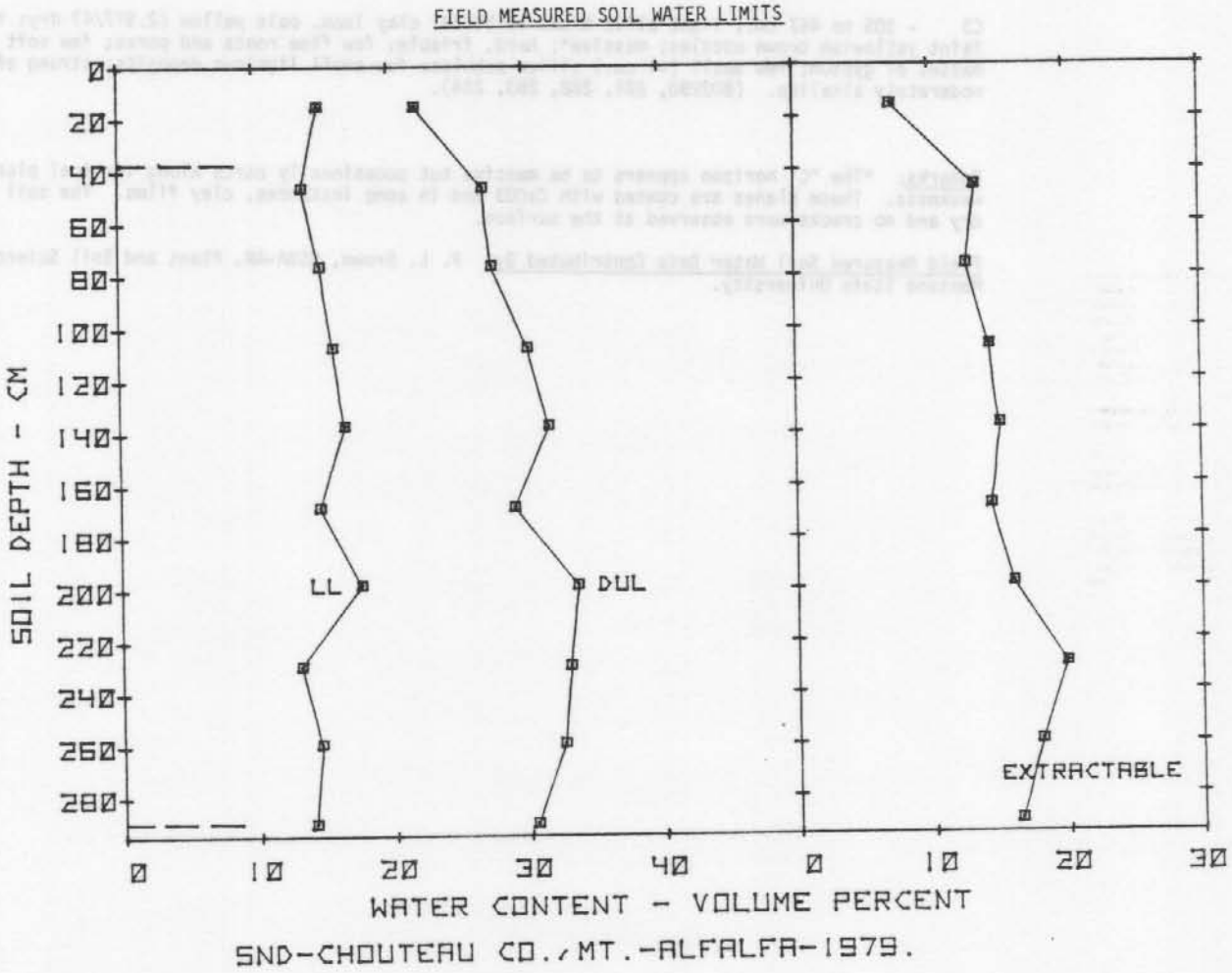
C2ca - 239 to 305 cm.; grayish brown (10YR5/2) clay loam, light brownish gray (10YR6/2) dry; few fine distinct yellowish brown mottles; massive*; hard, firm; few fine roots and pores; few widely spaced and thin horizontal bands of clayey strata; few fine threads of CaCO3 and soft crystalline masses of gypsum; violent effervescence, moderately alkaline; gradual wavy boundary. (802279).

C3 - 305 to 467 cm.; light olive brown (2.5Y5/4) clay loam, pale yellow (2.5Y7/4) dry; few fine faint yellowish brown mottles; massive*; hard, friable; few fine roots and pores; few soft crystalline masses of gypsum; few small (<1 cm.) silica pebbles; few small lignious deposits; strong effervescence, moderately alkaline. (802280, 281, 282, 283, 284).

Remarks: *The "C" horizon appears to be massive but occasionally parts along vertical planes of weakness. These planes are coated with CaCO3 and in some instances, clay films. The soil is very dry and no cracks were observed at the surface.

Field Measured Soil Water Data Contributed By: P. L. Brown, USDA-AR, Plant and Soil Sciences Department, Montana State University.

Pedon Number: S80MT-015-1



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	14.8	22.0	7.2
46	13.6	27.0	13.4
76	14.9	27.6	12.7
107	15.8	30.2	14.4
137	16.6	31.7	15.1
168	14.7	29.1	14.4
198	17.7	33.7	16.0
229	13.2	33.1	19.9
259	14.6	32.6	18.0
290	14.1	30.5	16.4

TOTAL WATER EXTRACTED FROM PROFILE = 45.1 Cm.

SAD

CLASSIFICATION: FINE-LOAMY, MIXED, THERMIC ARIDIC ARGIUSTOLL

S 80IX-303 -003 SAMPLE NOS. 81P 14 - 21 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND 2-.05	CLAY FINE LT .0002	SILT COARSE .002-.02	SILT FINE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.5	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM)-WEIGHT 2-5	5-20	20-75	>75MM WT PCT OF WHOLE SOIL
				PCT OF <2MM (3A1)											PCT OF <75MM (3B1)			
81 14	1	0- 15	AP	17.6	16.0	66.4			7.0	9.0	23.1	35.1	8.1	0.1	--	TR	--	--	43	--
81 15	2	15- 36	A12	18.4	19.6	62.0			7.8	11.8	21.5	31.9	8.5	0.1	--	TR	--	--	40	--
81 16	3	36- 57	B21T	30.3	21.7	48.0			10.6	10.9	16.7	24.2	7.0	0.1	--	--	--	--	31	--
81 17	4	57- 81	B22T	29.3	22.9	47.8			9.5	13.4	16.4	24.0	7.3	0.1	--	--	--	--	31	--
81 18	5	81-105	B23T	25.9	21.4	52.7			9.9	11.5	17.7	26.1	8.5	0.2	0.2	TR	--	--	35	TR
81 19	6	105-130	B24T	21.3	16.7	62.0			7.4	9.3	16.2	32.8	10.7	0.2	0.1	TR	TR	--	44	TR
81 20	7	130-165	B25TK	23.6	19.7	56.7	10	13.4	6.3	14.1	30.9	10.3	0.7	0.7	TR	--	--	--	43	TR
81 21	8	165-203	B26TK	20.7	17.5	61.3	6	10.9	8.8	14.4	35.2	10.7	0.6	0.4	1	1	--	--	46	2

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL S	EXTRACTABLE FE 6C2B	EXTRACTABLE AL 6C7A	EXTRACTABLE MN 6D2A	CEC 8A1	RATIO/CLAY 15 BAR 8B1	ATTERBERG LL 4F1	ATTERBERG PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2-0.06 BAR 4B1A	WATER CONTENT 0.06-15 BAR 4B1C	WRD 1/3-15 BAR 4B1C	WRD 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		PCT OF <2MM									PCT	<0.4MM	<- G/CC ->			CM/CM	<- -PCT OF <2MM ->				CM/CM
81 14	1	0.52	0.049						0.63	0.27			1.62	1.70	0.016		9.7	22.2	16.2	4.7	0.19
81 15	2	0.45	0.046						0.61	0.40			1.58	1.66	0.017		10.2	23.5	16.6	7.4	0.15
81 16	3	0.53	0.059						0.59	0.40			1.36	1.58	0.051		16.4	27.7	22.1	12.0	0.14
81 17	4	0.38							0.66	0.40			1.44	1.60	0.036		16.0		18.3	11.8	0.09
81 18	5	0.19							0.58	0.40			1.49	1.62	0.028		14.6		17.2	10.3	0.10
81 19	6	0.12							0.58	0.43			1.50	1.59	0.020		12.1		15.3	9.1	0.09
81 20	7	0.09							0.31	0.30			1.63	1.66	0.010		10.7		11.9	7.0	0.08
81 21	8	0.06							0.38	0.34			1.60				10.1			7.0	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A 6A2E	MG 5E5A 6D2D	NA 5E5A 6P2B	K 5E5A 6Q2B	SUM BASES 6H9A	ACIDITY	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8B	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM NH4OAC 5C3	CO3 AS CACO3 <2MM 5C1	CO3 AS CACO3 GRMS /CM 6E1G	RES. GRMS /CM 6E1	CASO4 AS GYPSUM <2MM 6F1A	CASO4 AS GYPSUM <20MM 6F4	SAT PASTE 8C1B	PH CACL2 .01M 8C1F	PH H2O 1:1 8C1F
		MEQ / 100 G								PCT		<- PCT ->		PCT		<- PCT ->			1:2	1:1
81 14	1	10.1	3.0	TR	0.9	14.0	0.8		14.8	11.1	TR	TR	95	100	--	2200		7.3	7.5	7.9
81 15	2	9.7	3.1	TR	0.7	13.5	0.9		14.4	11.3			94	100	--				7.4	8.0
81 16	3	15.1	4.4	0.1	0.7	20.3	1.7		22.0	17.9			92	100	--				7.5	8.0
81 17	4	15.7	4.0	0.2	0.7	20.6	--		20.8	17.5			100	100	--				7.6	8.1
81 18	5		4.3	0.3	0.7					15.1				100	2				7.8	8.2
81 19	6		4.5	0.4	0.8					12.4				100	2				7.8	8.4
81 20	7		3.3	0.5	0.4					7.2				100	21				7.9	8.4
81 21	8		3.8	0.2	0.5					7.8				100	15				7.9	8.4

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6D1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8A3A	ELEC. COND. 8D5	MINERALOGY CLAY X-RAY	MINERALOGY CLAY DTA	FS & VFS TOTAL DOM RES	FS & VFS TOTAL DOM WEATH
		MEQ / LITER									PCT		MMHOS /CM	RELATIVE AMOUNTS		PCT	
81 14	1	6.4	2.6	0.0	0.6	--	3.1	1.0	2.7	3.1	32.8	TR	1.01				
81 15	2												0.21				
81 16	3												0.21				
81 17	4												0.20	MT 3	MI 3	KK 2	QZ 1	KK17	89	FK10
81 18	5												0.23							
81 19	6												0.24							
81 20	7												0.24							
81 21	8												0.24	CA 3	MT 2	MI 2	KA 1	KK11	94	FK 4

ESTIMATED BULK DENSITY FOR LAYER 8.

MMHOS/CM OF 1:2 WATER EXTRACT (6B1) FOR LAYERS 2, 3, 4, 5, 6, 7, 8.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ FK FELDS-FELD
CA CALCITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

TOTAL ANALYSIS 7C1
CLAY

SAMPLE NO.	HZN NO.	K2O 6Q3A	Fe 6C7A
		<- - - PCT - - - ->	
81 17	4	2.4	5.6
81 21	8	1.8	3.3

Series: Series not designated[1/].

Pedon Number: S80TX-303-3

Classification: Fine-loamy, mixed, thermic Aridic Argiustolls.

Location: Lubbock County, Texas: 1 mile east on Farm Road 1294 from its intersection with U.S. Highway 87 then 297 meters south and 158 meters west. Site is 1 meter west of the center of Charles Wendt's small rainout shelter on the Texas A&M Research Center.

Usee and Vegetation: Cropland - presently in cotton.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1000 meters.

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: Less than 0.5 percent. Plane surface.

Sampled and Described By: Larry F. Ratliff Date: 9-16-80

Ap - 0 to 15 cm.; reddish brown (5YR4/4) fine sandy loam, dark reddish brown (5YR3/3) moist; weak fine and medium granular structure; very hard, very friable; common fine roots; moderately alkaline; abrupt smooth boundary. (810014).

A12 - 15 to 36 cm.; reddish brown (5YR4/4) fine sandy loam, dark reddish brown (5YR3/3) moist; weak coarse platy structure; very hard, firm; few fine roots and pores; moderately alkaline; clear smooth boundary. (810015).

B21t - 36 to 57 cm.; yellowish red (5YR4/6) sandy clay loam, dark reddish brown (5YR3/4) moist; moderate medium subangular blocky structure; extremely hard, firm; few fine roots; few fine and medium pores; thick continuous clay films on faces of peds; moderately alkaline; gradual smooth boundary. (810016).

B22t - 57 to 81 cm.; yellowish red (5YR5/6) sandy clay loam, reddish brown (5YR4/4) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common fine and medium pores; thin continuous clay films on faces of peds; moderately alkaline; gradual wavy boundray. (810017).

B23t - 81 to 109 cm.; yellowish red (5YR5/6) light sandy clay loam, yellowish red (5YR4/6) moist; weak fine and medium subangular blocky structure; hard, firm; few fine roots; many fine and medium pores; thin patchy clay films on faces of peds; few fine threads and soft masses white CaCO3; slightly effervescence, moderately alkaline; gradual wavy boundary. (810018).

B24t - 109 to 130 cm.; yellowish red (5YR5/6) light sandy clay loam, yellowish red (5YR4/6) moist; weak fine and medium subangular blocky structure; hard, friable; many fine and medium pores; thin patchy clay films on faces of peds; common fine threads of white CaCO3; slightly effervescence, moderately alkaline; abrupt smooth boundary. (810019).

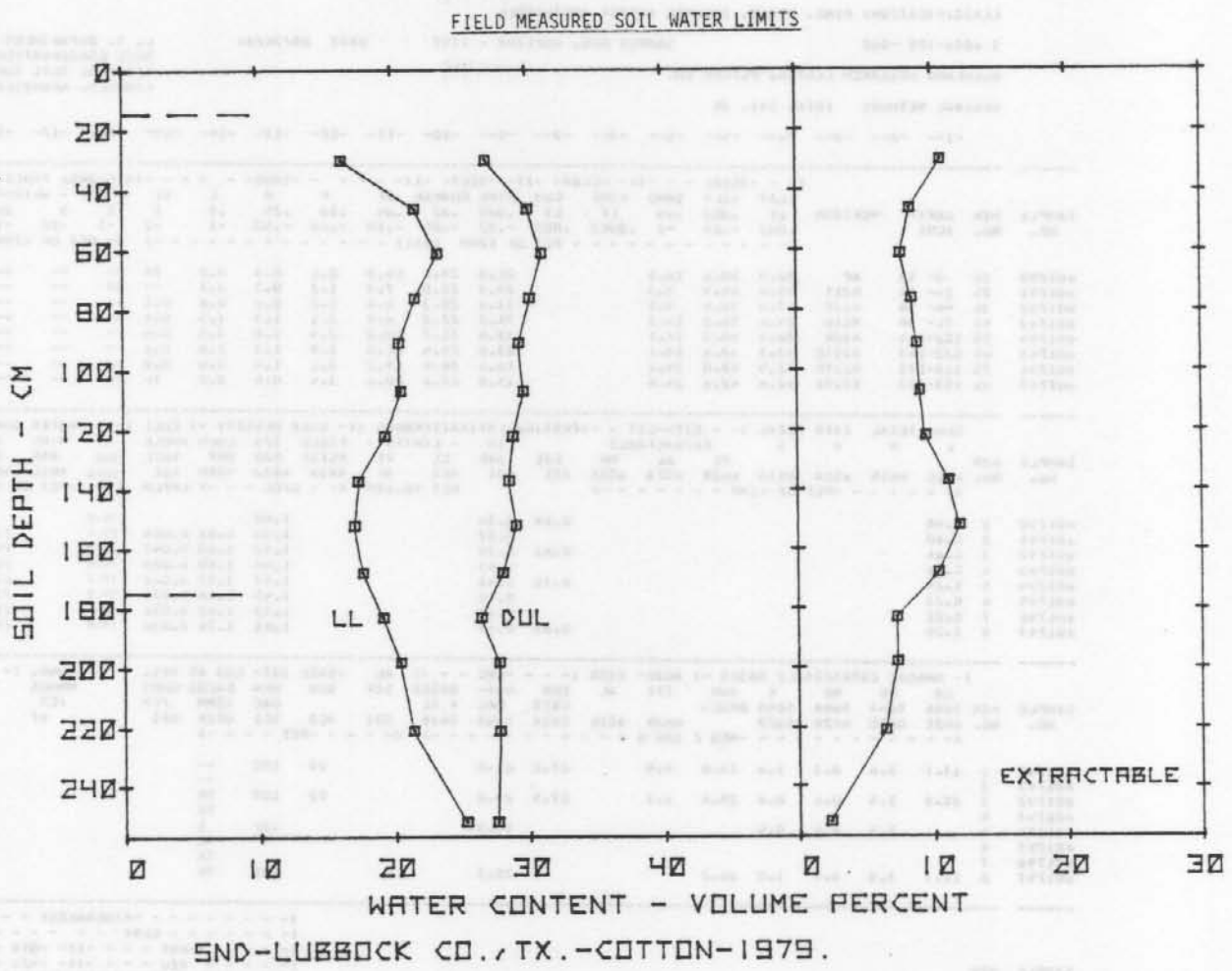
B25tca - 130 to 165 cm.; pink (5YR7/4) light sandy clay loam, reddish yellow (5YR6/6) moist; weak fine subangular blocky structure; very hard, friable; many fine and medium pores; few concretions up to 1 cm. diameter; violent effervescence, moderately alkaline; gradual wavy boundary. (810020).

B26tca - 165 to 203 cm.; pink (5YR7/4) light sandy clay loam; reddish yellow (5YR6/6) moist; weak fine subangular blocky structure; hard, friable; few fine pores; estimated 10 to 15 percent by volume white CaCO3, few large concretions; violent effervescence, moderately alkaline. (810021).

Remarks: [1/]Sampled as Acuff fine sandy loam. Soil differs from Acuff by having a vertical clay distribution that decreases with depth. The A12 horizon is a compact, well expressed plowpan. No clay films observed below 130 cm. Clod samples could not be collected in the B26tca horizon because of large concretions. Auger was stopped at 203 cm. in two separate locations.

Field Measured Soil Water Data Contributed By: Charles W. Wendt, Texas A&M Agriculture Research and Extension Center, Lubbock, Texas.

Pedon Number: S80TX-303-3



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	16.3	27.0	10.7
46	21.7	30.1	8.4
61	23.4	31.1	7.7
76	21.7	30.2	8.5
91	20.5	29.4	8.9
107	20.6	29.7	9.1
122	19.4	28.9	9.5
137	17.4	28.6	11.2
152	17.1	29.1	12.0
168	17.7	28.1	10.4
183	19.2	26.5	7.3
198	20.5	27.8	7.3
221	21.4	27.8	6.4
252	25.3	27.6	2.3

TOTAL WATER EXTRACTED FROM PROFILE = 22.1 Cm.

SND

CLASSIFICATION: FINE, MIXED, THERMIC ARIDIC ARGIUSTOLL

S 80TX-375 -002 SAMPLE NOS. 80P1790 - 1797 DATE 05/26/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

BUSHLAND RESEARCH CENTER, POTTER CO.

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM)-WEIGHT 2 -5	COARSE FRACTIONS(MM)-WEIGHT -20	COARSE FRACTIONS(MM)-WEIGHT -75	COARSE FRACTIONS(MM)-WEIGHT 75	WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
801790	1S	0- 15	AP	32.9	50.6	16.5			21.5	29.1	14.0	2.1	0.3	0.1	TR	--	--	--	2	--
801791	2S	15- 31	B21T	45.6	44.9	9.5			24.3	20.6	7.9	1.2	0.3	0.1	--	TR	--	--	2	--
801792	3S	46- 58	B22T	37.0	53.5	9.5			33.2	20.3	6.6	1.2	0.4	0.8	0.1	--	--	--	3	--
801793	4S	71- 84	A11b	29.6	56.2	14.2			34.2	22.0	8.9	2.1	1.3	1.5	0.4	--	--	--	5	--
801794	5S	102-114	A12B	28.9	55.5	16.1			33.8	21.7	10.2	2.4	1.6	1.5	0.4	--	--	--	6	--
801795	6S	132-147	B21TB	33.5	47.4	19.1			23.0	24.4	12.5	2.9	1.3	1.6	0.8	--	--	--	7	--
801796	7S	163-173	B21TB	32.9	43.0	24.1			16.6	26.4	19.2	3.1	1.0	0.6	0.2	--	--	--	5	--
801797	8S	193-203	B22TB	32.6	42.6	24.8			15.0	27.6	20.6	3.4	0.6	0.2	TR	TR	--	--	4	--

SAMPLE NO.	HZN NO.	CARBON TOTAL C 6A1C	TOTAL N 6B1B	EXTR TOTAL P 6S1A	S 6R3A	EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4F	FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	COLE 1/3 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM ->									PCT <0.4MM		<- G/CC ->			CM/CM	<- PCT OF <2MM ->				CM/CM
801790	1	0.98							0.64	0.36				1.40			16.0			11.9	
801791	2	0.80								0.37				1.50	1.83	0.069	23.4		23.9	16.8	0.11
801792	3	0.64							0.62	0.39				1.42	1.80	0.041	21.3		24.6	14.6	0.14
801793	4	0.36								0.43				1.48	1.80	0.026	20.0		21.8	12.8	0.13
801794	5	0.24							0.70	0.46				1.47	1.57	0.022	19.7		22.1	13.2	0.13
801795	6	0.23								0.43				1.45	1.56	0.025	19.8		23.2	14.5	0.13
801796	7	0.22								0.40				1.53	1.68	0.032	18.5		21.3	13.3	0.12
801797	8	0.26							0.63	0.43				1.61	1.76	0.030	19.6		19.3	12.9	0.09

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5B4A 6N2E	MG 5B4A 6U2D	NA 5B4A 6P2B	K 5B4A 6Q2B	SUM BASES 6H2B	ACID- ITY 6G1E	EXTR AL 5A3A	CEC - SUM CATS	NH4- OAC 5A8A	BASES + AL 5A3B	AL SAT 5G1	BASE SAT- SUM 5C3	NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1E	PH H2O 8C1A
		<- MEQ / 100 G ->										<- PCT ->						1:2	1:1
801790	1	17.7	3.6	0.1	1.6	23.0	4.0		27.0	21.0			85	100	--			6.9	7.1
801791	2														--			6.9	7.0
801792	3	20.8	3.9	0.1	0.8	25.6	2.3		27.9	23.0			92	100	TR			7.3	7.5
801793	4														TR			7.7	8.0
801794	5		3.3	0.6	0.9					19.9				100	1			7.8	8.1
801795	6														TR			7.7	8.1
801796	7														TR			7.7	8.1
801797	8	21.3	3.0	0.9	1.0	26.2				20.5				100	TR			7.6	8.1

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - <2U 7A2B	<2U 7A2B	<2U 7A2B	<2U 7A2B	DTA - <2U 7A3	DTA - <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- PCT ->	
801790	1	MI 3	MT 2	KK 2	QZ 1	KK 5		2.7	5.3
801791	2								
801792	3	MI 3	MT 2	KK 2	QZ 1	KK 7		2.5	5.3
801793	4								
801794	5	MI 3	MT 3	KK 2	QZ 1	KK		2.5	4.9
801795	6								
801796	7								
801797	8	MI 3	MT 3	KK 2	QZ 1	KK 6		2.5	5.4

FAMILY CONTROL SECTION: DEPTH 15- 58 PCT CLAY 27 PCT .1-75MM 1

ESTIMATED BULK DENSITY FOR LAYER 1,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA MT MONTMORILL KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Series not designated[1/].

Pedon Number: S80-TX-375-2

Classification: Fine, mixed, thermic Aridic Argiustolls.

Location: Potter County, Texas: 300 meters south and 75 meters west of the NW corner of Sec. 197, Block 1, plot 6 of W. C. Johnson study - Bushland Research Center.

Use and Vegetation: Fallow - previously cropped to wheat and grain sorghum.

Parent Material: High Plains eolian mantle.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1140 meters.

Drainage and Permeability: Well drained in upper 64 cm., moderately well drained below. Slowly permeable.

Water Table and Duration: Appears to be a perched water table above the buried profile for brief periods following rains.

Slope: About 0.3 percent. Plane surface.

Sampled and Described By: Larry F. Ratliff and F. Pringle Date: 6-25-80

Ap - 0 to 15 cm.; brown (7.5YR4/2) silty clay loam, dark brown (7.5YR3/2) moist; weak fine granular structure; hard, friable; few fine roots; common fine pores; neutral; clear smooth boundary. (801790).

B21t - 15 to 46 cm.; dark reddish brown (5YR3/2) silty clay, dark reddish brown (5YR2.5/2) moist; moderate medium blocky structure; very hard, firm; few fine roots between peds; common fine pores; thick continuous clay films on faces of peds; neutral; clear wavy boundary. (801791).

B22t - 46 to 64 cm.; brown (7.5YR5/2) silty clay loam, dark brown (7.5YR3/2) moist; moderate medium blocky structure; very hard, firm; few fine roots mostly between peds; common fine pores; few silt coatings and thin patchy clay films on faces of peds; mildly alkaline; clear wavy boundary. (801792).

A11b - 64 to 89 cm.; brown (7.5YR5/2) silty clay loam, dark brown (7.5YR4/2) moist; few fine faint gray mottles; moderate medium blocky structure; hard, friable; few fine roots and pores; common silt coatings on faces of peds; horizon is slightly brittle; slight effervescence, moderately alkaline; gradual wavy boundary. (801793).

A12b - 89 to 132 cm.; pale brown (10YR6/3) silty clay loam, brown (10YR5/3) moist; few fine faint gray mottles; weak fine and medium subangular blocky structure; hard, friable; few fine roots and pores; common silt coatings on faces of peds; horizon is slightly brittle; slight effervescence; moderately alkaline; clear smooth boundary. (801794).

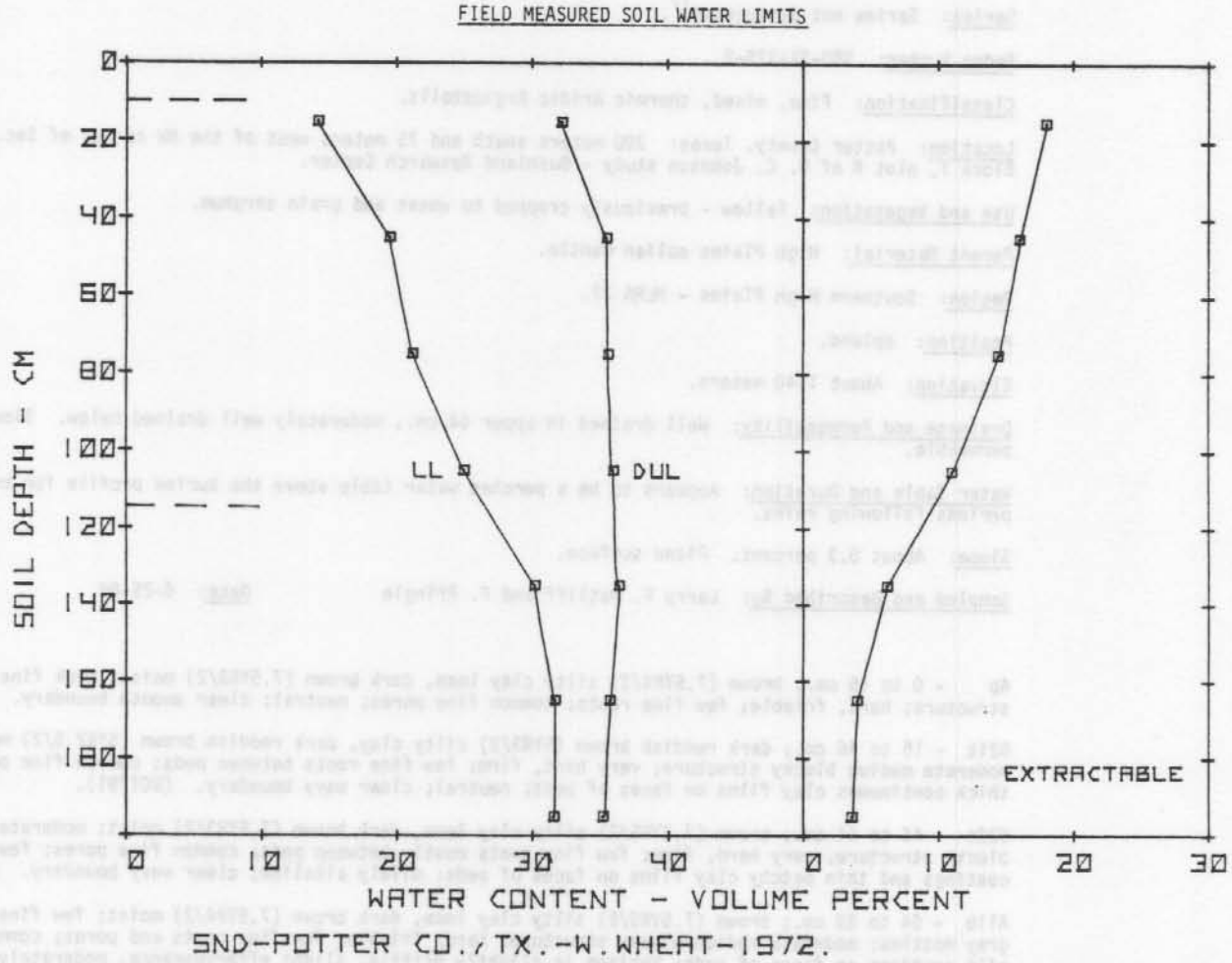
B21tb - 132 to 191 cm.; strong brown (7.5YR5/6) clay loam, strong brown (7.5YR4/6) moist; moderate fine and medium blocky structure; very hard, firm; few fine pores; common distinct dark and very dark gray coatings on the faces of some peds; slight effervescence, moderately alkaline; gradual wavy boundary. (801795, 796).

B22tb - 191 to 229 cm.; strong brown (7.5YR5/6) clay loam, strong brown (7.5YR4/6) moist; moderate medium blocky structure; very hard, firm; few fine pores; common light brownish gray silt coatings on faces of peds; weak effervescence, moderately alkaline (801797).

Remarks: [1/]Soil is an unnamed inclusion in Pullman soils. Soil appears to have formed in an old drainageway leading to a playa lake to the north. There is no visible indication of the inclusion at the surface. Site was sampled because of difference in pattern of water extraction from surrounding Pullman soils. Average rainfall about 46 cm.

Field Measured Soil Water Data Contributed By: W. C. Johnson (retired), USDA-AR, Conservation and Production Research Laboratory, Bushland, Texas.

Pedon Number: S80TX-375-2

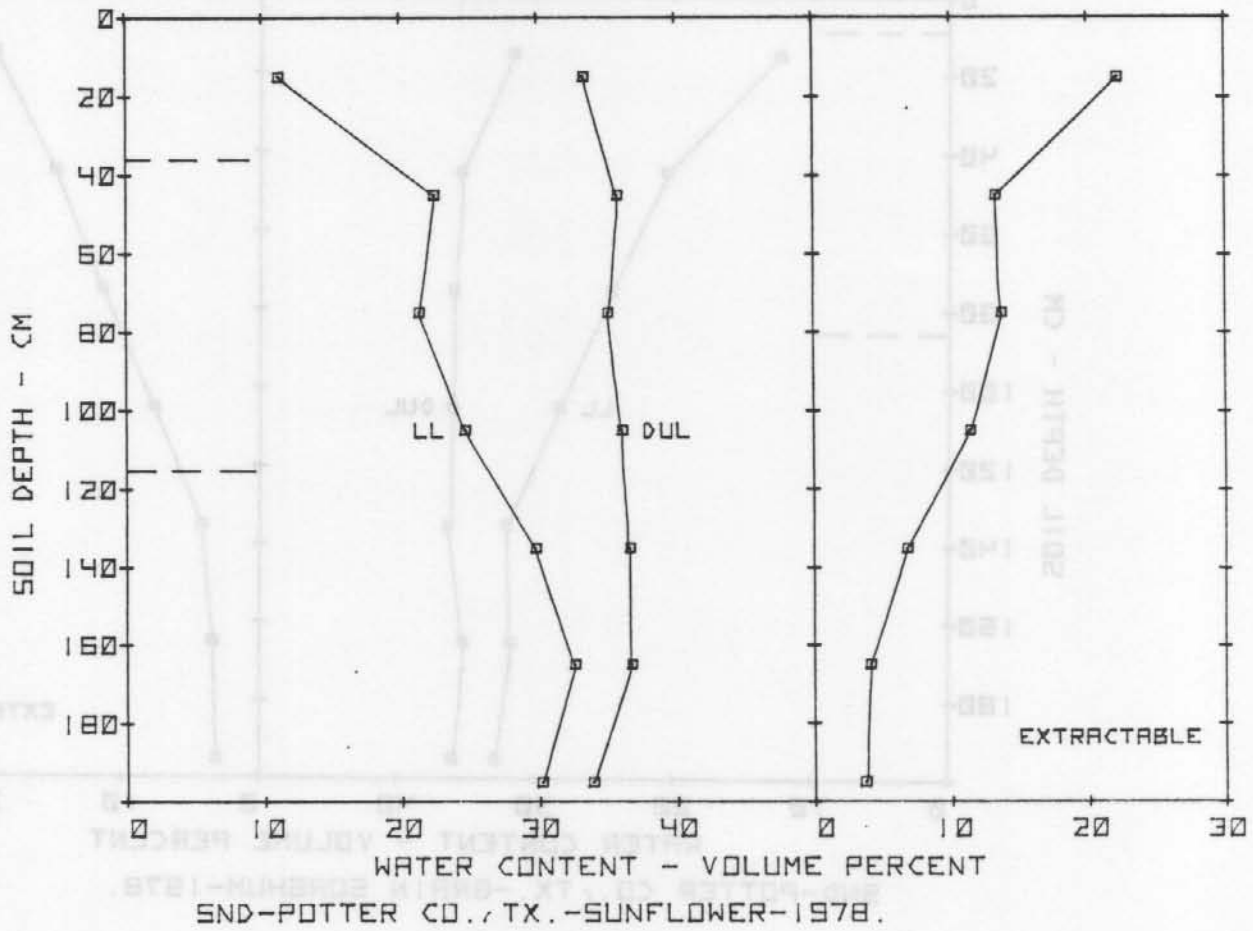


SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	14.2	32.2	18.0
45	19.5	35.5	16.0
75	21.2	35.6	14.4
105	25.0	36.0	11.0
135	30.2	36.4	6.2
165	31.7	35.7	4.0
195	31.6	35.2	3.6

TOTAL WATER EXTRACTED FROM PROFILE = 22.0 Cm.

Pedon Number: S80TX-375-2

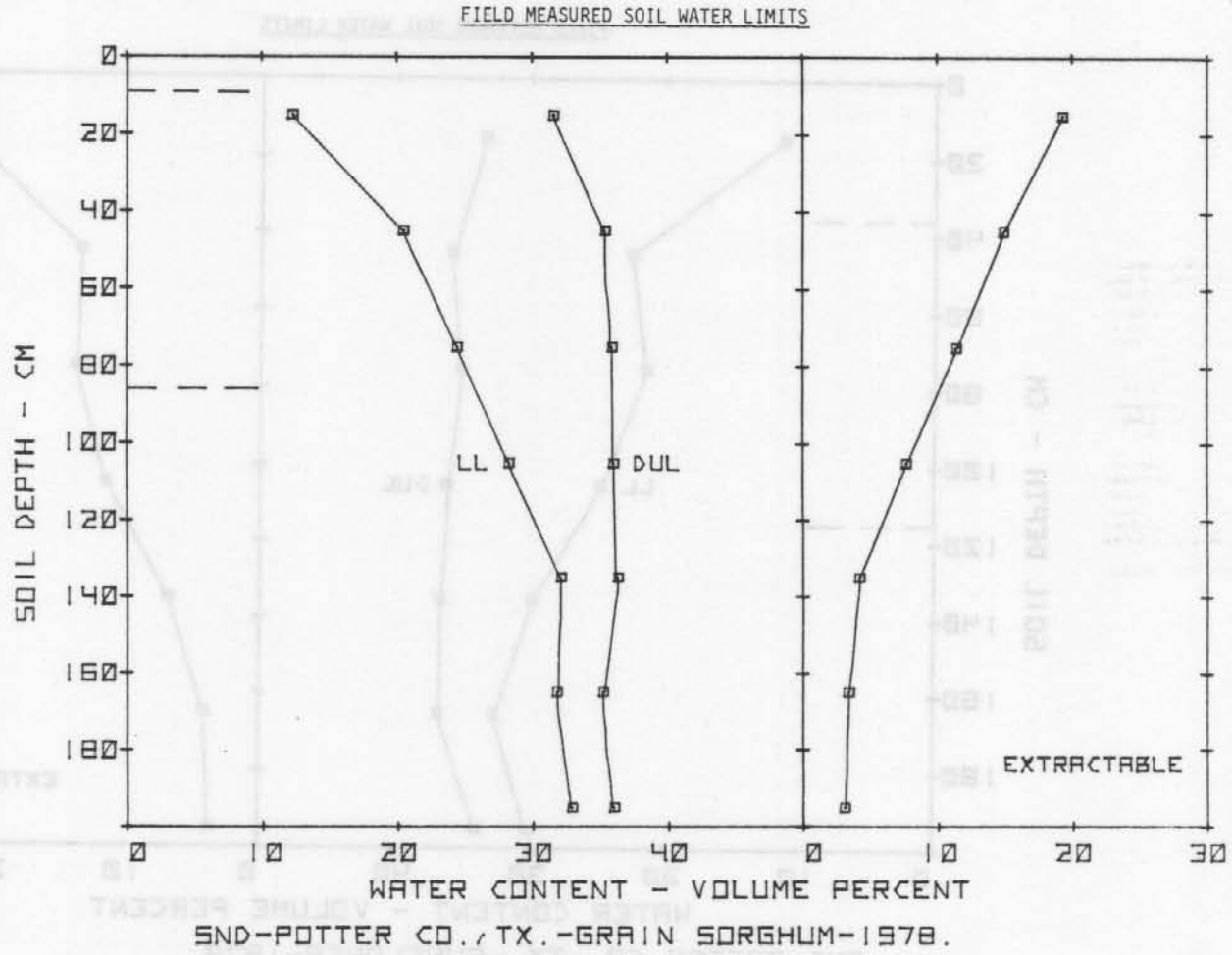
FIELD MEASURED SOIL WATER LIMITS



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	11.2	33.4	22.2
45	22.5	35.8	13.3
75	21.4	35.1	13.7
105	24.7	36.1	11.4
135	29.8	36.6	6.8
165	32.6	36.7	4.1
195	30.2	33.9	3.7

TOTAL WATER EXTRACTED FROM PROFILE = 22.6 Cm.

Pedon Number: S80TX-375-2



SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	12.3	31.6	19.3
45	20.5	35.4	14.9
75	24.5	35.9	11.4
105	28.3	36.0	7.7
135	32.1	36.3	4.2
165	31.8	35.2	3.4
195	32.9	36.0	3.1

TOTAL WATER EXTRACTED FROM PROFILE = 19.2 Cm.

SHELLABARGER V

CLASSIFICATION: FINE-LOAMY, MIXED, THERMIC UDIC ARGIUSTOLL

S 80EK-81 -002 SAMPLE NOS. 81P 900 - 904 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2A1, 2B

-1- -2- -3- -4- -5- -6- -7- -8- -9- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND -2	CLAY FINE LT .0002	SILT CO3 LT .002	SILT FINE .002 -.02	SILT COARSE -.05 -.10	SAND VF .10 -.25	SAND F .25 -.50	SAND M -1	SAND C -2	SAND VC -5	COARSE FRACTIONS(MM) WEIGHT 2	5	20	>2MM -1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 900	1S	0- 15	A1	17.6	44.9	37.5		10.9	34.0	19.2	10.4	5.0	2.4	0.5	1	2	1	22	4
81 901	2S	15- 30	B1	22.5	46.1	31.4		7.9	32.2	17.9	10.1	5.0	3.1	1.3	2	5	--	25	7
81 902	3S	30- 64	B21T	20.1	30.5	49.4		8.2	22.3	23.3	13.7	5.9	4.4	2.1	1	9	--	33	10
81 903	4S	64- 99	B22T	18.9	26.7	54.4		9.4	17.4	24.4	14.6	5.4	5.7	4.8	3	10	6	44	19
81 904	5S	99-127	2B23T	44.9	31.6	23.5		15.8	15.8	14.4	6.9	0.9	0.6	0.7	2	TR	--	11	2

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	S	DITH-CIT EXTRACTABLE FE 6G2B	AL 6G7A	MN 6G2A	RATIO/CLAY CEC 8B1	15 BAR 8B1	ATTERBERG LIMITS - LL 4F1	PI 4F	FIELD 1/3 BAR 4A1A	BULK DENSITY 1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4B1	COLE - - WATER CONTENT - - 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT	<0.4MM	<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 900	1	2.01	0.159						0.70	0.45				1.41	1.48	0.016	11.7		15.3	8.0	0.10
81 901	2	1.33	0.108						0.58	0.40				1.35	1.48	0.030	12.8	26.7	20.0	9.1	0.14
81 902	3	0.49	0.043						0.53	0.35				1.38	1.53	0.033	10.6	25.6	20.3	7.0	0.17
81 903	4	0.28							0.46	0.33				1.63	1.92	0.048	9.1	21.9	21.1	6.1	0.21
81 904	5	0.19							0.51					1.52	1.96	0.087	23.5		25.4		0.13

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5B5A 6N2E	MG 5B5A 6O2D	NA 5B5A 6P2B	K 5B5A 6Q2E	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC - SUM CATS	NH4- OAC	BASES + AL 5A3B	BASE SAT SUM 5G1	NH4 OAC 5C3	CO3 AS CACO3 <2MM 5C1	RES. OHMS /CM 6E1G	COND. MMHOS /CM 8E1	PH - CACL2 .01M 8C1F	H2O 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - ->										<- - - - -PCT - - - ->					1:2	1:1
81 900	1	3.6	2.3	0.1	0.8	10.8	4.3		15.1	12.4		72	87				5.3	5.8
81 901	2	7.9	2.8	TR	0.7	11.4	3.2		14.6	13.0		78	88				5.6	6.3
81 902	3	6.1	3.3	TR	0.3	9.7	2.1		11.8	10.7		82	91				5.8	6.7
81 903	4	4.7	3.0	0.2	0.2	8.1	2.1		10.2	8.8		79	92				6.0	6.9
81 904	5	13.9	9.5	1.5	0.7	25.6	2.2		27.8	23.1		92	100	TR			7.2	8.0

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - <2U 7A2I	7A2I	7A2I	7A2I	7A3	7A3	TOT ANL 7C3 CLAY - <2U - K20 603A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
81 900	1	MI 3	KK 2	MT 1	QZ 1			2.5	5.3
81 901	2	MI 3	MI 3	KK 2	QZ 1	KK19		2.1	5.8
81 902	3	MI 4	MT 3	KK 2	CL 1	KK16		3.5	5.6
81 903	4								
81 904	5								

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE MT MONTMORILL QZ QUARTZ CL CHLORITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Shellabarger Variant.

Pedon Number: S80-OK-017-2

Classification: Fine-loamy, mixed, thermic Udic Argiustolls.

Location: Canadian County, Oklahoma: In the SE 1/4 of Sec. 4, T.12N., R.8W., of the Oklahoma State University Agriculture Experiment Station near El Reno. Site is 1.5 meters north of Tube 3, Watershed 4 of the Water Quality Research Study.

Use and Vegetation: Native rangeland - predominantly little bluestem, with some sideoats, switchgrass and Indiangrass.

Parent Material: Assumed to be forming in colluvium over red beds.

Region: Central Rolling Red Prairies - MLRA 80A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well-drained. Moderately permeable in the upper 100 cm., slowly permeable below.

Water Table and Duration: None.

Slope: About 5 percent. Upper side slope.

Sampled and Described By: Larry F. Ratliff Date: 12-10-80

A1 -- 0 to 15 cm.; brown (7.5YR4/2) loam, dark brown (7.5YR3/2) moist; weak medium prismatic parting to weak fine and medium subangular blocky structure; hard, friable; many fine and medium roots; common fine and medium pores; few angular coarse fragments mostly less than 10 mm. in diameter; medium acid; clear smooth boundary. (810900).

B1 -- 15 to 30 cm.; reddish brown (5YR4/3) loam, dark reddish brown (5YR3/3) moist; weak medium prismatic parting to weak fine and medium subangular blocky structure; hard, friable; many fine and medium roots; common fine and medium pores; thin patchy clay films on faces of peds; few angular coarse fragments mostly less than 10 mm. in diameter; slightly acid; gradual wavy boundary. (810901).

B21t -- 30 to 64 cm.; reddish brown (5YR5/4) loam, reddish brown (5YR4/4) moist; weak medium prismatic parting to weak fine and medium subangular blocky structure; hard, firm; common fine roots; common fine and medium pores; thin patchy clay films on faces of peds; about 5 to 10 percent by volume of angular and rounded coarse fragments up to 2 cm. in diameter; neutral; gradual wavy boundary. (810902).

B22t -- 64 to 99 cm.; yellowish red (5YR5/6) gravelly sandy loam, yellowish red (5YR4/6) moist; weak fine and medium subangular blocky structure; hard, firm; common fine roots and pores; thin patchy clay films on ped faces, films are continuous around gravel; about 10 percent by volume of angular and rounded coarse fragments up to 4 cm. in diameter; neutral; clear wavy boundary. (810903).

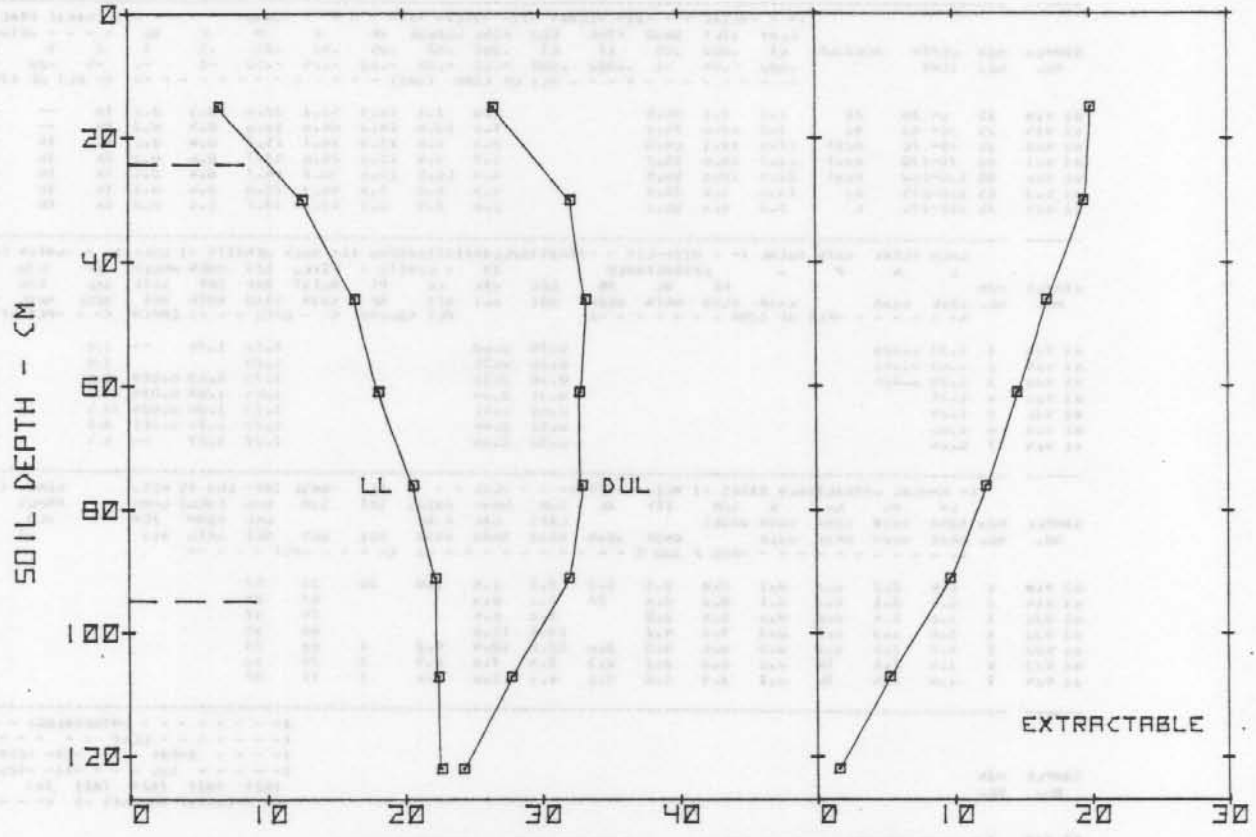
IIB23t -- 99 to 127 cm.; red (2.5YR5/6) clay, red (2.5YR4/6) moist; strong medium prismatic parting to strong medium and coarse blocky structure; extremely hard, very firm; few fine roots between peds; thick continuous clay film on faces of peds; few coarse fragments less than 5 mm. in diameter; moderately alkaline. (810904).

Remarks: Soil differs from Shellabarger by having a clayey IIBt horizon. Soil was moist to about 45 cm. and very dry below. Core samples difficult to obtain because of dryness and coarse fragments. Average Annual Rainfall about 75 cm.

Field Measured Soil Water Data Contributed By: R. G. Menzel and G. A. Coleman, USDA-AR, Southern Plains Watershed and Water Quality Laboratory, Durant and Chickasha, OK.

Pedon Number: S80OK-017-2

FIELD MEASURED SOIL WATER LIMITS



SHELLABARGER VARIANT-CANADIAN CO., OK.-RANGELAND-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	6.6	26.6	20.0
30	12.7	32.2	19.5
46	16.5	33.3	16.8
61	18.2	32.8	14.6
76	20.7	33.0	12.3
91	22.3	32.0	9.7
107	22.5	27.8	5.3
122	22.7	24.3	1.6

TOTAL WATER EXTRACTED FROM PROFILE = 16.7 Cm.

SILANA

CLASSIFICATION: FINE-LOAMY, SILICEOUS, THERMIC ULTIC HAPLUSTALF

S 80IX-145 -002 SAMPLE NOS. 81P 916 - 924 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CRLP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	(- - -TOTAL - - -)(- -CLAY- -)(- -SILT- -)(- - - - - -SAND- - - - - -)(-COARSE FRACTIONS(MM)-)(>2MM) WT																
				CLAY LT .002	SILT .05	SAND -2	FINE .0002	CO3 FINE LT .002	COARSE .002-.02	VF .02-.05	F .05-.10	M .10-.25	C .25-.5	VC .5-1	1-2	2-5	5-20	20-75	.1- 75	PCT OF WHOLE
				<- - - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				SOIL
81 916	1S	0- 30	A1	2.0	7.1	90.9		4.0	3.1	14.5	53.1	22.6	0.3	0.2	TR	--	--	76	TR	
81 917	2S	30- 45	A2	3.2	17.6	79.2		7.2	10.4	14.8	44.9	18.8	0.3	0.2	TR	--	--	64	--	
81 920	3S	45- 76	B21T	17.9	18.1	64.0		8.5	9.6	13.0	34.7	15.7	0.4	0.2	TR	TR	--	51	--	
81 921	4S	76-130	B22T	28.7	15.6	55.7		5.7	7.9	11.6	29.6	13.7	0.6	0.2	TR	TR	--	44	TR	
81 922	5S	130-160	B23T	22.9	20.6	56.5		4.5	16.1	10.6	30.7	14.7	0.4	0.1	TR	TR	--	46	--	
81 923	6S	160-215	B3	14.6	9.5	75.9		4.5	5.0	7.9	46.3	21.0	0.6	0.1	TR	TR	--	68	--	
81 924	7S	215-276	C	7.3	4.9	88.3		1.6	2.9	0.1	43.2	37.7	1.1	0.2	TR	TR	--	82	--	

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR P	TOTAL 6A3A	(- - DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6C2A	CEC 8D1	(-RATIO/CLAY)(ATTERBERG (- BULK DENSITY -) COLE 15 - LIMITS - LL 4F1	PI 4F	FIELD MOIST 4A3A	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1	(- - -WATER CONTENT - - -) WRD 2- BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1E	15 BAR 4B2A	WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->								PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 916	1	0.33	0.020						0.70	0.60			1.78	1.78	--	2.0		4.2	1.2	0.05
81 919	2	0.09	0.011						0.28	0.28			1.78			2.0			0.4	
81 920	3	0.19	0.024						0.36	0.36			1.73	1.83	0.019	9.6		11.8	6.6	0.09
81 921	4	0.21							0.38	0.39			1.65	1.85	0.039	15.0		16.0	11.3	0.11
81 922	5	0.19							0.46	0.41			1.73	1.86	0.024	12.5		15.2	9.3	0.10
81 923	6	0.06							0.52	0.44			1.73	1.79	0.011	8.5		10.4	6.4	0.08
81 924	7	0.09							0.52	0.45			1.27	1.27	--	4.5		12.9	3.3	0.12

SAMPLE NO.	HZN NO.	(- NH4OAC EXTRACTABLE BASES -) CA 5B5A 6A2E	MG 5B5A 6A2D	NA 5B5A 6P2E	K 5B5A 6A2G	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G4A	(- - - CEC - - -) SUM CATS	NH4OAC 5A3A	BASES + AL 5A8B	AL SAT 5A3B	BASE SAT- SUM NH4 5C1	CACO3 6E1G	AS RES. LIMS <2MM /CM 6E1	COND. MMHOS /CM 8A1	(- - - -PH - - -) CACL2 .01M 8C1F	H2O 8C1F
		<- - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->						1:2	1:1
81 916	1	0.4	0.2	0.1	0.1	0.8	1.5	0.2	2.3	1.4	1.0	20	35	57				4.1	4.5
81 919	2	0.4	0.1	0.2	0.1	0.8	0.4	TR	1.2	0.4			67	89				4.7	5.3
81 920	3	3.0	1.4	0.2	0.2	5.6	2.0		7.6	6.4			74	87				5.5	6.1
81 921	4	5.6	3.3	0.1	0.3	9.3	4.2		13.5	11.0			69	85				5.2	5.6
81 922	5	4.7	3.5	0.1	0.3	8.6	4.0	0.0	12.6	10.9	9.2	7	68	79				4.7	5.3
81 923	6	3.4	2.6	TR	0.2	6.2	2.2	0.3	8.4	7.6	6.5	5	74	82				4.7	5.4
81 924	7	1.8	1.4	TR	0.1	3.3	1.0	0.1	4.3	3.8	3.4	3	77	87				4.7	5.5

SAMPLE NO.	HZN NO.	(- - - - - - - - -MINERALOGY - - - -) (- - - - - - - CLAY - - - - - - -) (- - - - X-RAY - - - -)(- -DTA - -) (- - - <2U - - - -)(- -<2U - -) 7A2I	7A2I	7A2I	7A2I	7A3	7A3	TOT ANL 7C3 CLAY K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
81 916	1								
81 919	2	MI 2	KK 2	QZ 2				1.7	3.4
81 920	3								
81 921	4	KK 3	MI 3	MT 2	QZ 1	KK35		2.0	6.2
81 922	5								
81 923	6	MT 3	MI 3	KK 3	QZ 1	KK23		2.0	5.9
81 924	7								

ESTIMATED BULK DENSITY FOR LAYER 2.

ANALYSES: ON ALL UNSIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE QZ QUARTZ MT MONTMORILL

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Silawa.

Pedon Number: S80TX-145-2.

Classification: Fine-loamy, siliceous, thermic Ultic Haplustalfs.

Location: Falls County, Texas: 2.4 miles northwest on FM 2027 from its intersection with FM 1048 at Pleasant Grove, then 0.75 miles northeast on an unpaved road to gate and 200 meters southeast in field.

Use and Vegetation: Improved pasture - Coastal Bermudagrass (6 yrs. old).

Parent material: Sandy and loamy alluvium.

Region: Texas Claypan Area - MLRA 87.

Position: High terrace of Brazos River.

Elevation: ----------

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: About 1.5 percent on convex upper sideslope.

Sampled and Described By: Larry F. Ratliff Date: 12-4-80

A1 - 0 to 30 cm.; light yellowish brown (10YR6/4) fine sand, dark yellowish brown (10YR6/4) moist; single grain; slightly hard, very friable; many fine and medium roots; very strongly acid; clear smooth boundary. (810918).

A2 - 30 to 45 cm.; very pale brown (10YR7/4) loamy fine sand, yellowish brown (10YR5/4) moist; single grain; slightly hard, very friable; many fine and medium roots; strongly acid; clear wavy boundary. (810919).

B21t - 45 to 70 cm.; red (2.5YR5/6) heavy fine sandy loam, red (2.5YR4/6) moist; few fine faint yellowish red mottles; weak medium subangular blocky structure; hard, friable; many fine and medium roots; common fine pores; thin patchy clay films on faces of peds; slightly acid; clear wavy boundary. (810920).

B22t - 70 to 130 cm.; red (2.5YR5/6) sandy clay loam, red (2.5YR4/6) moist; common medium and coarse reddish yellow (5YR6/6) and yellowish red (5YR5/8) mottles; moderate medium and coarse blocky structure; very hard, firm and compact in place; common fine and medium roots; few fine and medium pores; thick continuous clay films on faces of peds; medium acid; gradual wavy boundary. (810921).

B23t - 130 to 180 cm.; red (2.5YR5/8) sandy clay loam, red (2.5YR4/8) moist; weak medium subangular blocky structure; very hard, friable; common fine and medium roots; few fine and medium pores; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary. (810922).

B3 - 180 to 215 cm.; red (2.5YR5/8) fine sandy loam, red (2.5YR4/8) moist; weak fine subangular blocky structure; hard, very friable; few fine and medium roots; common fine and medium pores; thin patchy clay films on faces of some peds; few lenses and pockets of reddish yellow loamy sand - percentage increases with depth; strongly acid; diffuse wavy boundary. (810923).

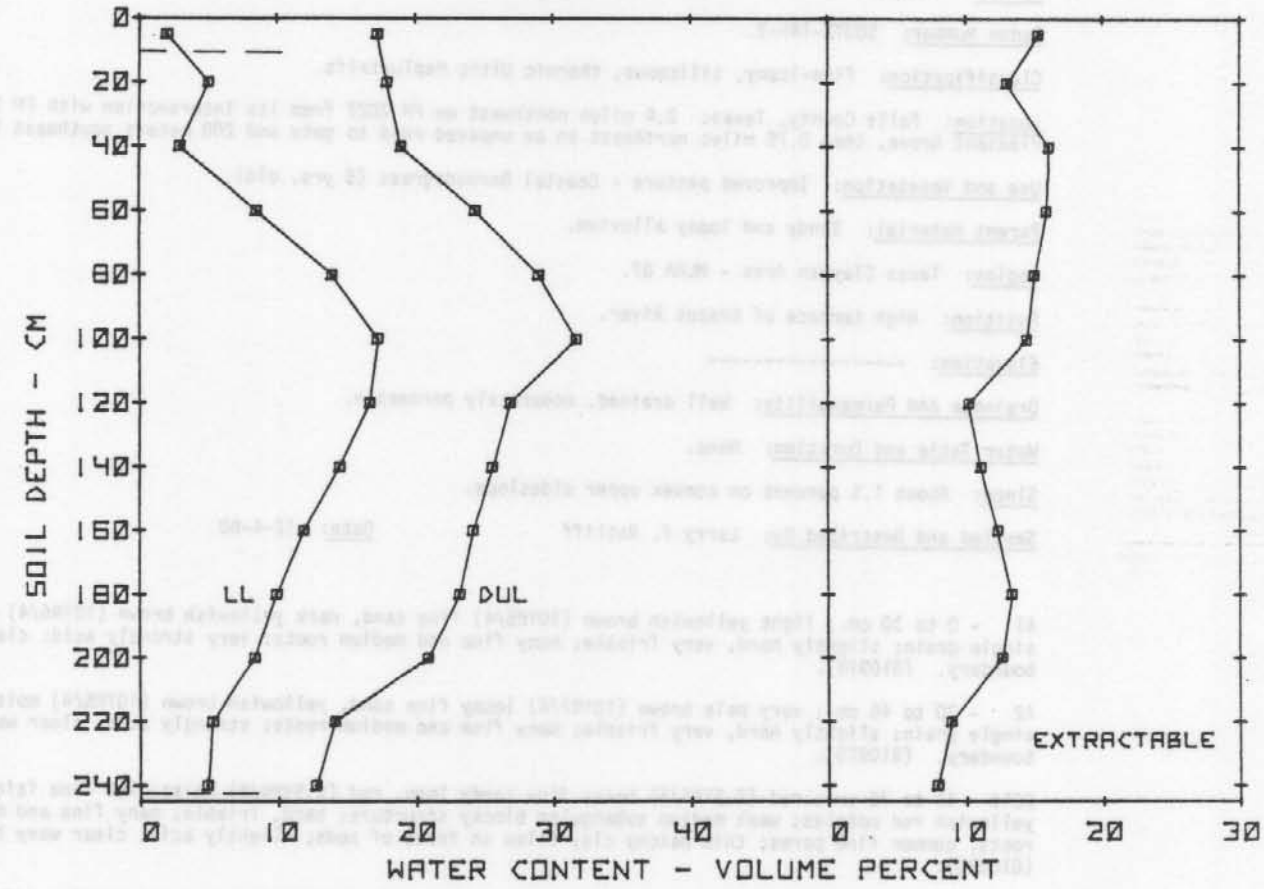
C - 215 to 270 cm.; reddish yellow (5YR7/8) loamy sand, reddish yellow (5YR6/8) moist; massive; hard, very friable; few fine and medium roots; few lenses of yellowish red loamy materal; strongly acid. (810924).

Remarks: Average Annual Rainfall is about 86 cm. Beginning at about 130 cm., the clay content gradually decreases with depth. The soil was moist when described - the A2 horizon was near saturation. Water apparently perches for brief periods following rains at the contact of the A2 and Bt horizon.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S80TX-145-2

FIELD MEASURED SOIL WATER LIMITS



SILAWA FS-FALLS CO.,TX.-COASTAL BERMUDA-1980.

SOIL DEPTH	LL	DUL	EXTRACTABLE
Cm.	Volume Percent Water		
5	2.0	17.3	15.3
20	5.0	18.0	13.0
40	2.9	19.0	16.1
60	8.5	24.4	15.9
80	14.0	29.0	15.0
100	17.3	31.7	14.4
120	16.7	26.9	10.2
140	14.5	25.6	11.1
160	11.9	24.2	12.3
180	9.9	23.2	13.3
200	8.3	20.9	12.6
220	5.2	14.1	8.9
240	4.8	12.7	7.9

TOTAL WATER EXTRACTED FROM PROFILE = 31.7 Cm.

SILAMA I

CLASSIFICATION: FINE-LOAMY, SILICEOUS, FRIGID ULTIC HAPLUSTALF

S 81A-145 -003 SAMPLE NOS. 81P 925 - 931 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	TOTAL FINE SAND .05 -.10	CLAY LT .002	FINE SILT .002 -.02	COARSE SILT .02 -.05	VF SAND .05 -.10	F SAND .10 -.25	M SAND .25 -.5	C SAND .5 -1	VC SAND 1 -2	COARSE FRAG (2MM) WEIGHT 2 -5	5 -20	20 -75	75 -381	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1) ->				
81 925	1S	0- 18	AP	32.8	16.1	81.1			4.4	11.7	13.8	44.5	21.3	1.3	0.2	TR	--	--	67	--
81 926	2S	18- 48	A12	2.8	10.0	79.2			0.0	12.0	13.4	45.0	20.1	0.6	0.1	TR	--	--	66	--
81 927	3S	48- 86	B21T	22.1	18.5	59.4			0.5	12.0	11.9	34.0	12.0	0.5	0.2	TR	TR	--	47	--
81 928	4S	86-112	B22T	14.2	24.0	61.8			0.5	13.5	13.5	33.8	13.8	0.5	0.4	TR	TR	--	48	--
81 929	5S	112-152	B23T	12.2	25.0	62.8			0.9	10.7	13.8	33.3	13.6	0.9	0.6	TR	TR	--	48	TR
81 930	6S	152-208	B24T	22.1	24.1	53.8			9.0	13.1	10.9	30.6	11.8	0.4	0.1	TR	TR	--	43	--
81 931	7S	208-274	C	10.0	24.8	57.2			9.8	15.0	10.8	29.6	5.9	0.4	0.5	TR	TR	--	46	--

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	TOTAL N 6B3A	EXTR TOTAL P	TOTAL S 6K3A	DITH-CIT EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC 8A1	TITRATIC/CLAY 15 BAR 8A1	ATTERBERG LIMITS LL 4F1	PI 4J	BULK DENSITY FIELD MOIST 4A3A	1/3 OVEN DRY 4A1D	WHOLE SOIL 4A1H	COLE 4D1	WATER CONTENT 2- 0.06 BAR 4B1A	0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 925	1	0.31	0.029						0.57	0.43			1.70				2.2			1.2	
81 926	2	0.11	0.003						0.36	0.36			1.93	1.93	--		2.1		6.1	1.0	0.10
81 927	3	0.29	0.040						0.43	0.41			1.70	1.78	0.015		12.2		13.5	9.1	0.07
81 928	4	0.16							0.40	0.40			1.67	1.72	0.010		8.5		9.9	5.7	0.07
81 929	5	0.11							0.41	0.43			1.72	1.78	0.011		7.7		10.6	5.3	0.09
81 930	6	0.14							0.50	0.43			1.65	1.76	0.022		13.5		16.9	9.6	0.12
81 931	7	0.09							0.58	0.44			1.66	1.77	0.016		11.9		15.2	8.0	0.12

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5E5A	MG 5B5A	NA 5B5A	K 5B5A	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G9A	CEC SUM CATS 5A3A	SUM + AL 5A8B	NH4- BASES 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT- NH4 5C1	CACO3 AS RES. CACO3 <2MM 6E1G	OHMS /CM 6E1	COND. MMHOS /CM 8F	PH CACL2 .01M 8C1F	H2O 8C1F
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->											<- - - - -PCT - - - ->					1:2	1:1
81 925	1	1.5	0.3	0.1	0.1	2.0	0.2		2.2	1.6			91	100	--			6.7	7.4
81 926	2	0.9	0.2	0.2	0.1	1.4	--		1.4	1.0			100	100	--			6.4	7.1
81 927	3	5.0	2.1	0.3	0.4	7.8	2.9		10.7	9.5			73	82				5.2	5.6
81 928	4	2.4	1.4	0.2	0.2	4.2	3.1	0.5	7.3	5.7	4.7	11	58	74				4.3	5.0
81 929	5	2.2	1.3	0.2	0.1	3.8	2.2	0.3	6.0	5.0	4.1	7	63	76				4.4	5.1
81 930	6	5.0	2.9	0.1	0.3	8.3	4.4	0.7	12.7	11.0	9.0	8	65	75				4.5	5.0
81 931	7	5.1	2.9	0.1	0.3	8.4	3.0	0.4	11.4	10.1	8.8	5	74	83				4.7	5.3

SAMPLE NO.	HZN NO.	MINERALOGY - CLAY - X-RAY - 7A2I	7A2I	7A2I	7A2I	DTA - <2U - 7A3	7A3	TOT ANL 7C3 CLAY - <2U - K20 6Q3A	Fe 6G7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 925	1								
81 926	2	MI 2	KK 2	QZ 2				1.8	3.1
81 927	3								
81 928	4	KK 3	MI 3	MT 2	VR 1	KK23		1.6	5.4
81 929	5								
81 930	6	MT 3	KK 3	MI 3	VR 1	KK35		1.6	5.7
81 931	7								

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE QZ QUARTZ MT MONTMORILL VR VERMICULITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Silawa taxadjunct[1/].

Pedon Number: S80TX-145-3

Classification: Fine-loamy, siliceous, thermic Ultic Haplustalfs.

Location: Falls County, Texas: 1.8 miles northwest on FM 2027 from its intersection with FM 1048 at Pleasant Grove, then 1.1 miles southwest and 0.3 miles northwest on unpaved road, then 75 feet southwest in field.

Use and Vegetation: Presently fallow - previously cropped to grain sorghum.

Parent Material: Sandy and loamy alluvium.

Region: Texas Claypan Area - MLRA 87.

Position: High terrace of Brazos River.

Elevation: ----------

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None.

Slope: Less than 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 12-19-80

Ap - 0 to 18 cm.; dark brown (10YR3/3) loamy fine sand; single grain; slightly hard, very friable; common fine and very fine roots; mildly alkaline; clear smooth boundary. (810925).

A12 - 18 to 48 cm.; yellowish brown (10YR5/4) loamy fine sand; single grain; slightly hard, very friable; common fine and very fine roots; neutral; abrupt smooth boundary. (810926).

B21t - 48 to 86 cm.; yellowish red (5YR4/6) sandy clay loam; few fine distinct pale brown mottles; moderate medium blocky structure; very hard, firm; few fine roots and pores; thick continuous clay films on faces of peds; few fine lenses of sandy material; medium acid; gradual wavy boundary. (810927).

B22t - 86 to 112 cm.; strong brown (7.5YR5/6) fine sandy loam; weak medium subangular blocky structure; very hard, friable; occasional fine root; few fine and medium pores; thin patchy clay films on faces of peds; few fine soft masses and concretions of Fe-Mn; strongly acid; gradual wavy boundary. (810928).

B23t - 112 to 152 cm.; reddish yellow (7.5YR6/6) fine sandy loam; few fine and medium distinct strong brown (7.5YR4/6,5/6) mottles some of which have firm centers; weak medium subangular blocky structure; hard, friable; few fine and medium pores; thin patchy clay films on faces of peds; few fine soft masses and concretions of Fe-Mn; strongly acid; clear wavy boundary. (810929).

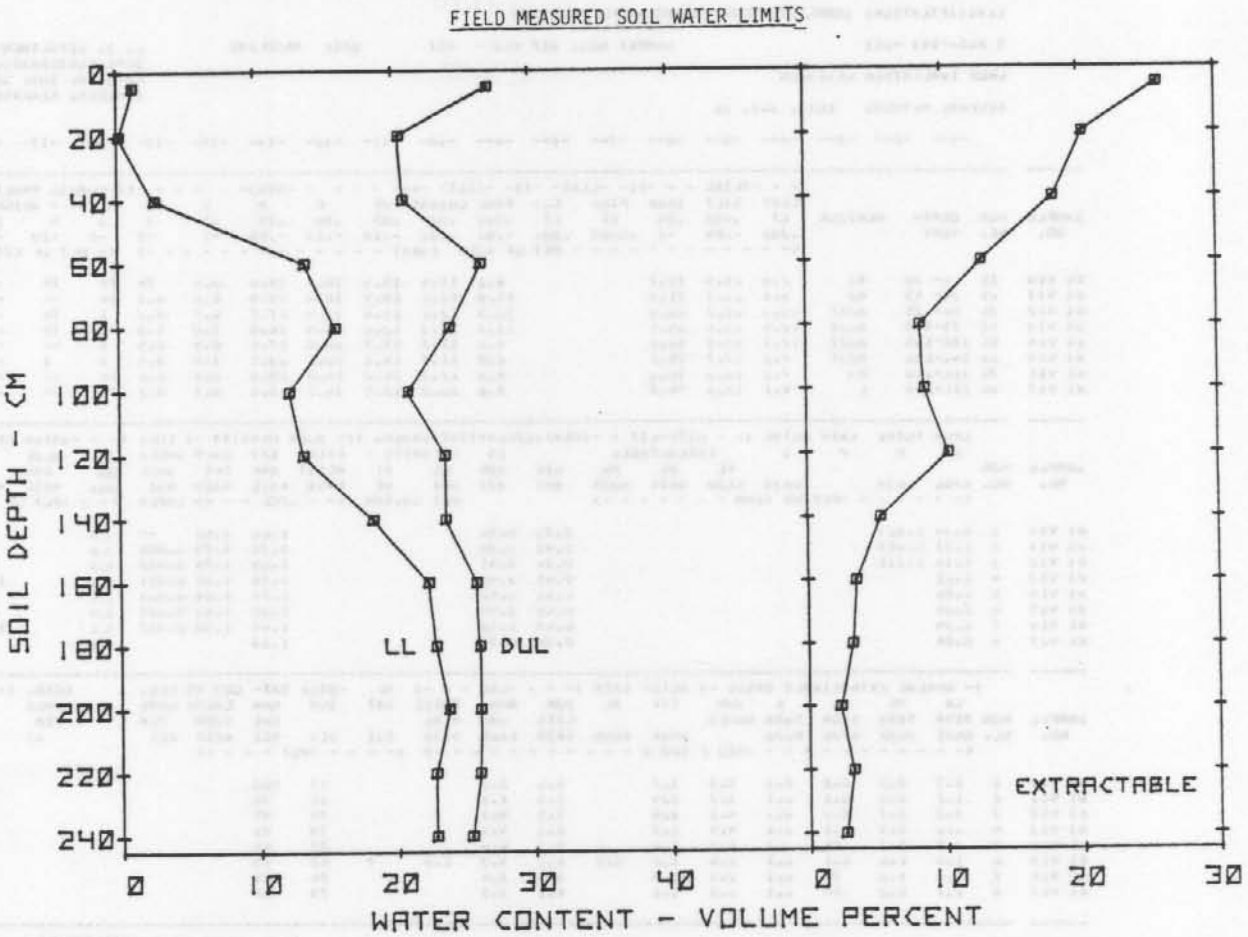
B24t - 152 to 208 cm.; reddish yellow (7.5YR6/6) light sandy clay loam; many medium and coarse prominant red (2.5YR4/6) mottles; common fine and medium distinct gray (10YR6/1) and light brownish gray (10YR6/2) mottles; moderate medium subangular blocky structure; very hard, firm; few fine and medium pores; thin patchy clay films on faces of peds; few fine soft masses and concretions of Fe-Mn; strongly acid; gradual wavy boundary. (810930).

C - 208 to 274 cm.; mottled yellowish red (5YR4/6), reddish yellow (7.5YR6/6) and light gray (10YR7/1,7/2) light sandy clay loam; massive; hard, firm; common lenses of gray loamy sand; common fine soft masses and concretions of Fe-Mn; strongly acid. (810931).

Remarks: [1/]Differs from Silawa by having a double clay bulge. No evidence of skeletans was observed in the B22t or B23t horizons. Colors are for moist soil.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S80TX-145-3



SILAWA TAXADJ.-FALLS CO.,TX.-GRAIN SORGHUM-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
5	1.2	27.0	25.8
20	0.2	20.5	20.3
40	2.7	20.8	18.1
60	13.6	26.4	12.8
80	15.8	24.1	8.3
100	12.4	21.0	8.6
120	13.4	23.7	10.3
140	18.4	23.7	5.3
160	22.4	25.9	3.5
180	22.9	26.1	3.2
200	23.8	26.1	2.3
220	22.8	26.0	3.2
240	22.8	25.4	2.6

TOTAL WATER EXTRACTED FROM PROFILE = 22.4 Cm.

SILSTIC

CLASSIFICATION: LOAMY, SILICEOUS, THERMIC ARENIC PALEUSTALF

S 80TA-145 -001 SAMPLE NOS. 81P 910 - 917 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	FINE CLAY LT .0002	COARSE CLAY .0002-.002	FINE SILT .002-.02	COARSE SILT .02-.05	VF SAND .05-.10	F SAND .10-.25	M SAND .25-.50	C SAND .5-1	VC SAND 1-2	COARSE FRACTIONS(2MM) WEIGHT 2-5	5-20	20-75	75-381	>2MM WT PCT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1)->				
81 910	1S	0- 30	A1	2.8	23.5	73.7			8.1	15.4	15.9	30.9	18.8	8.5	TR	TR	TR	--	58	--
81 911	2S	30- 55	A2	4.4	23.7	71.9			11.6	12.1	15.5	30.8	18.9	8.0	0.1	TR	--	--	56	--
81 912	3S	55- 75	B21t	11.3	22.7	66.0			10.5	12.2	13.4	33.9	17.7	6.7	0.3	1	TR	--	53	1
81 913	4S	75-110	B22t	12.9	22.6	64.5			11.3	11.3	12.0	33.9	16.8	1.8	1.0	2	TR	--	53	2
81 914	5S	110-140	B23t	12.1	19.3	68.6			8.1	11.2	13.7	36.0	17.5	0.9	0.5	1	--	--	55	1
81 915	6S	140-180	B24t	7.2	17.7	75.1			6.0	11.7	14.1	38.2	20.5	1.4	0.4	1	1	--	62	2
81 916	7S	180-210	B3	7.2	16.8	76.0			4.8	12.0	14.0	39.8	20.8	0.8	0.6	TR	--	--	62	--
81 917	8S	210-240	C	9.7	15.8	74.7			5.0	10.0	12.5	39.7	21.6	0.7	0.2	TR	--	--	62	--

SAMPLE NO.	HZN NO.	TOTAL C 6A1G	TOTAL N 6B3A	EXTR P	TOTAL S 6H3A	EXTRACTABLE FE 6C2B	AL 6G7A	MN 6D2A	CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS LL 4F1	PI 4F	FIELD 1/3 BAR 4A1C	OVEN DRY 4A1P	AMBLE SOIL 4D1	COLE WATER CONTENT 2- 0.06 BAR 4B1A	0.06 1/3 BAR 4B1C	1/3 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- PCT OF <2MM - - - - - ->									PCT <0.4MM		<- G/CC - ->		CM/CM	<- - -PCT OF <2MM - ->			CM/CM
81 910	1	0.39	0.02						0.75	0.54			1.66	1.66	--	3.0	5.5	1.5	0.07
81 911	2	0.11	0.015						0.41	0.36			1.71	1.75	0.008	3.6	7.9	1.6	0.11
81 912	3	0.14	0.020						0.36	0.41			1.68	1.74	0.012	6.9	9.9	4.6	0.09
81 913	4	0.12							0.41	0.46			1.76	1.82	0.011	8.2	10.6	5.9	0.08
81 914	5	0.08							0.41	0.40			1.79	1.84	0.009	7.1	9.4	4.8	0.08
81 915	6	0.04							0.46	0.49			1.80	1.83	0.005	5.0	6.8	3.5	0.06
81 916	7	0.04							0.47	0.46			1.69	1.90	0.002	5.1	11.3	3.3	0.12
81 917	8	0.04							0.36	0.39			1.90			5.6		3.8	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E5A	MG 5E5A	NA 5E5A	K 5E5A	SUM BASES 6H2B	ACIDITY 6H3A	EXTR AL 6G9A	CEC SUM CATS 5A3B	CEC NH4-OAC 5A8B	CEC BASES + AL 5A3B	AL SAT 5G1	BASE SUM 5C3	SAT NH4 OAC 5C1	CO3 AS CACO3 <2MM 6E1G	RES. OHMS /CM 8E1	COND. MMHOS /CM 8C1	PH CACL2 .01M 8C1F 1:2	PH H2O 8C1F 1:1
		<- - - - - - - - - - -MEQ / 100 G - - - - - - - - - ->										<- - - -PCT - - - ->							
81 910	1	1.7	0.3	0.2	0.1	2.3	1.7		4.6	2.1			57	100				5.4	5.9
81 911	2	1.2	0.3	0.1	0.1	1.7	0.9		2.1	1.8			81	94				5.6	6.3
81 912	3	3.2	0.7	0.1	0.1	4.1	1.4		5.5	4.3			75	95				6.0	6.7
81 913	4	3.6	0.9	0.1	0.1	4.9	1.3		6.2	5.3			79	92				6.1	6.8
81 914	5	2.7	1.3	TR	0.1	4.1	1.6		5.7	4.9			72	84				5.3	5.8
81 915	6	1.4	1.6	0.1	0.1	3.6	1.0	0.2	4.2	3.3	2.8	7	62	79				4.5	5.1
81 916	7	1.6	1.2	TR	0.1	2.9	1.0		3.9	3.4			74	85				5.2	5.7
81 917	8	1.7	1.2	TR	0.1	3.0	1.1		4.1	3.5			73	86				5.5	6.0

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	7A2I	7A2I	7A2I	7A3	7A3	TOT ANL 7C3 CLAY -OTA <2U K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
81 910	1								
81 911	2	MI 4	KK 3	GZ 2	MI 1			1.9	4.1
81 912	3								
81 913	4	KK 4	MI 3	VR 2	MI 1	KK26		1.6	4.9
81 914	5								
81 915	6	KK 3	MI 3	VR 2	GZ 1	KK27		1.5	4.4
81 916	7								
81 917	8								

ESTIMATED BULK DENSITY FOR LAYER d,

ANALYSES: ST ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MICA KK KAOLINITE GZ QUARTZ MI MONTMORILL VR VERMICULITE

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Silstid[1/].

Pedon Number: S80TX-145-1

Classification: Loamy, siliceous, thermic Arenic Paleustalfs.

Location: Falls County, Texas: 2.4 miles northwest on FM 2027 from its intersection with FM 1048 at Pleasant Grove, then 0.75 miles northeast on unpaved road to gate and 350 meters southeast in field.

Use and Vegetation: Improved pasture - Coastal Bermudagrass (6 yrs. old).

Parent Material: Sandy and loamy alluvium.

Region: Texas Claypan Area - MLRA 87.

Position: High terrace of the Brazos River.

Elevation: ----------

Drainage and Permeability: Moderately well drained and moderately permeable.

Water Table and Duration: Observed at 210 cm., duration unknown. See remarks.

Slope: Less than 1 percent. Slightly concave surface.

Sampled and Described By: Larry F. Ratliff Date: 12-3-80

A1 - 0 to 30 cm.; pale brown (10YR6/3) loamy fine sand, brown (10YR4/3) moist; single grain; slightly hard, very friable; many fine and medium roots; medium acid; clear smooth boundary. (810910).

A2 - 30 to 55 cm.; very pale brown (10YR7/4) loamy fine sand, yellowish brown (10YR5/4) moist; single grain; slightly hard, very friable; many fine and medium roots; slightly acid; gradual wavy boundary. (810911).

B21t - 55 to 75 cm.; light yellowish brown (10YR6/4) fine sandy loam, yellowish brown (10YR5/4) moist; weak fine subangular blocky structure; hard, very friable; thin patchy clay films on faces of some peds; few fine Fe-Mn concretions; neutral; clear smooth boundary. (810912).

B22t - 75 to 140 cm.; light yellowish brown (10YR6/4) fine sandy loam, yellowish brown (10YR5/4) moist; common medium distinct (10YR5/8) mottles some of which have slightly hard centers; few fine distinct light brownish gray (10YR6/2) mottles; weak medium subangular blocky structure; very hard, firm; common fine and medium roots; common fine pores; thin patchy clay films on faces of peds; common Fe-Mn concretions up to 1 cm. in diameter; few rounded coarse fragments; slightly acid; gradual wavy boundary. (810913, 914).

B23t - 140 to 180 cm.; light gray (10YR7/2) fine sandy loam, light brownish gray (10YR6/2) moist; common medium distinct yellowish brown (10YR5/6,5/8) mottles some of which have slightly hard centers; weak fine subangular blocky structure; hard, friable; common fine and medium roots; common fine pores; thin patchy clay films on faces of peds; common Fe-Mn concretions up to 1 cm. in diameter; few coarse fragments; strongly acid; gradual wavy boundary. (810915).

B3 - 180 to 210 cm.; light gray (10YR7/2) light fine sandy loam, light brownish gray (10YR6/2) moist; many coarse distinct mottles in shades of brown and yellow; weak fine subangular blocky structure; hard, friable; horizon is slightly compact and centers of mottles are brittle; few fine and medium roots; common Fe-Mn concretions up to 2 cm. in diameter; medium acid; gradual wavy boundary. (810916).

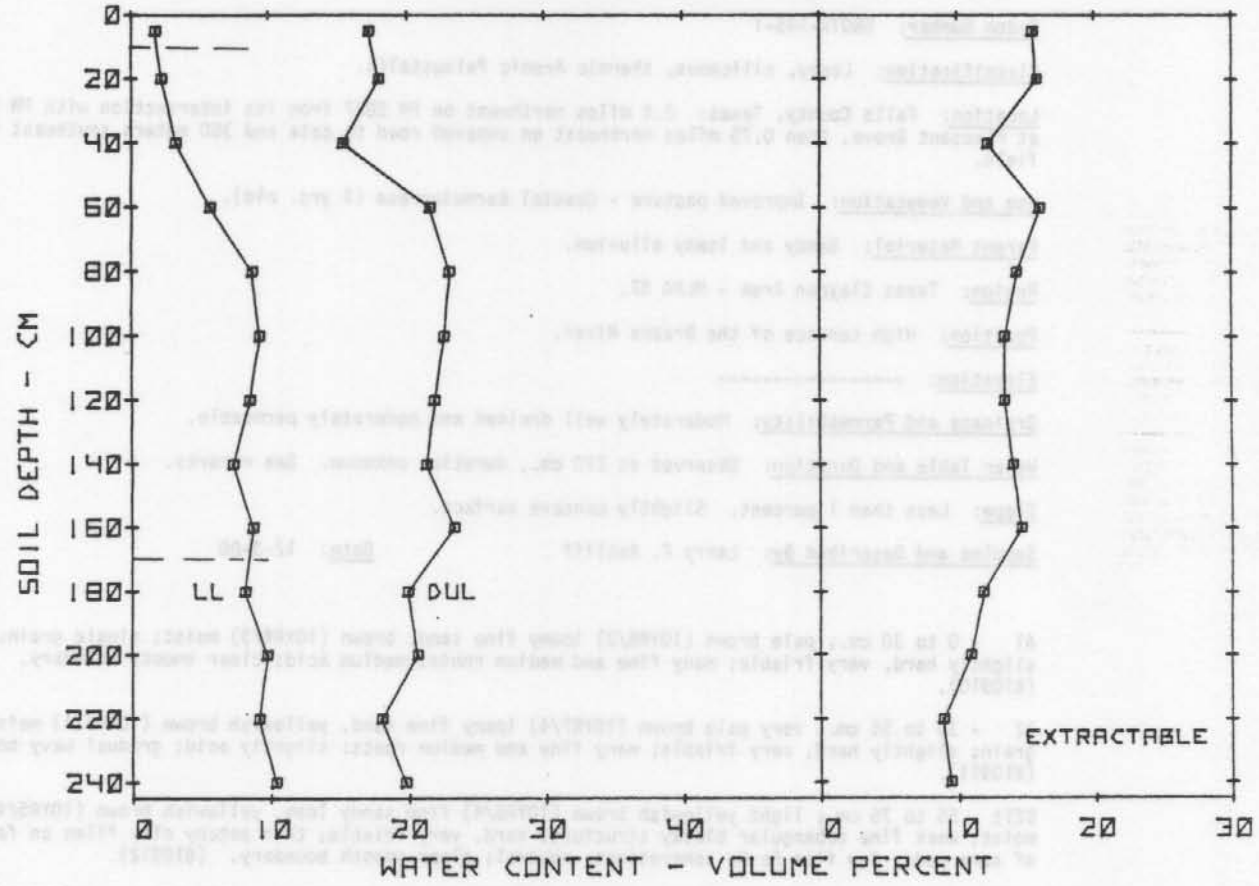
C - 210 to 240 cm.; mottled light brownish gray (10YR6/2) light gray (10YR7/2) and yellowish red (5YR5/6,5/8) light fine sandy loam; massive and compact in place; hard, friable; few fine and medium roots; common Fe-Mn concretions up to 2 cm. in diameter; medium acid. (810917).

Remarks: [1/]Soil differs from Silstid by having less than 18 percent clay in the control section. Pedon is borderline to Aquic sub-group. A water table was observed on two different occasions immediately above the compact C horizon. The C horizon apparently perches water for about 10 days following heavy rains.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S80TX-145-1

FIELD MEASURED SOIL WATER LIMITS



SILSTID LFS-FALLS CO., TX.-COASTAL BERMUDA-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
5	1.8	17.3	15.5
20	2.2	18.0	15.8
40	3.2	15.4	12.2
60	5.7	21.7	16.0
80	8.8	23.1	14.3
100	9.3	22.7	13.4
120	8.6	22.0	13.4
140	7.4	21.4	14.0
160	8.8	23.4	14.6
180	8.2	20.0	11.8
200	9.8	20.7	10.9
220	9.2	18.1	8.9
240	10.4	19.8	9.4

TOTAL WATER EXTRACTED FROM PROFILE = 32.5 Cm.

SOIL CLASSIFICATION- COARSE-LOAMY, MIXED, THERMIC UDIC PALEUSTALFS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, WTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SERIES - - - - - - - SPRINGER

SOIL NO - - - - - - S75TX-17-2 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760289-760299 DECEMBER 1978

DEPTH	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1B, 3A1C														RATIO		
		SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	SAND COS 1-.5	SAND MEDS .5-.25	SAND FNES .25-.10	SAND VFNS .10-.05	SILT COSI .05-.02	SILT FNSI .02-.002	SILT VFSI .002-.10	SAND TI .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	8D1 15-BAR TO CLAY
CM		PCT LT 2MM													PCT	PCT	CLAY
000-015	A1	83.9	10.0	6.1	4.1	.1	2.4	11.0	48.2	22.2	7.3	2.7		61.7	67		.88
015-032	B11T	82.4	7.0	10.6	8.1	TR	2.8	10.5	46.7	22.4	5.0	2.0		60.0	76		.43
032-057	B12T	71.4	11.6	17.0	13.2	TR	2.8	9.0	37.6	22.0	7.2	4.4		49.4	78		.39
057-076	B2T	68.2	12.8	19.0	14.6	TR	2.6	8.4	35.0	22.2	7.5	5.3		46.0	77		.37
076-096	B11tb	71.8	11.9	16.3	12.5	.1	2.6	9.3	37.4	22.2	7.2	4.7		49.6	77		.38
096-120	B12TB	75.4	7.7	16.9	13.5	.1	3.1	9.6	38.8	23.8	5.0	2.7		51.6	80		.39
120-142	B2Tb	72.7	6.6	20.7	17.3	.1	3.0	8.9	38.9	21.8	4.8	1.8		50.9	84		.42
142-159	B3TCAB	74.4	6.7	18.9	14.1	.1	3.7	8.9	38.4	23.3	5.1	1.6		51.1	75		.43
159-187	IIB21CA	53.9	22.6	23.5	1.7	13.9	8.4	6.3	10.2	11.1	7.0	15.6		42.8	7	9	.30
187-238	IIB22CA	44.4	28.2	27.4	2.3	2.3	4.9	5.9	17.4	13.9	7.0	21.2		30.5	8	7	.22
238-265	IIB23CA	53.7	22.6	23.7	4.3	1.3	4.5	6.6	25.1	16.3	6.4	16.2		37.5	18	11	.29

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2	WEIGHT GT 75	75-20	20-5	5-2	LT .074	BULK DENSITY 20-2	4A1D 1/3-BAR	4A1H OVEN DRY	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR	4B1C 1/3-BAR	4B2 15-BAR	4C1 WRD	CARBONATE 6B1B LT	6A1A LT	8C1A 1/1	8C1S 1/2
CM	PCT	PCT	PCT LT 75			LT20	PCT	G/CC	G/CC		PCT	PCT	PCT	CM/CM	2 PCT	.002 PCT	H2O	CACL
000-015	0	0	0	0	0	26	0	1.50A					2.7		TR		7.1	6.9
015-032	0	0	0	0	0	27	0	1.50	1.57	.015		10.8	8.6	.09	TR		7.0	6.7
032-057	0	0	0	0	0	39	0	1.45	1.56	.025		18.1	6.7	.17	TR		7.2	6.7
057-076	0	0	0	0	0	42	0	1.53	1.65	.026		14.6	7.1	.11	0		7.1	6.6
076-096	0	0	0	0	0	39	0	1.64	1.70	.012		10.6	6.2	.07	0		7.2	6.7
096-120	0	0	0	0	0	35	0	1.63	1.70	.014		12.6	6.6	.10	TR		7.3	6.9
120-142	0	0	0	0	0	37	0	1.60	1.70	.021		14.8	8.7	.10	TR		7.5	7.2
142-159	0	0	0	0	0	35	0	1.57	1.71	.029		17.7	8.1	.15	TR		7.8	7.5
159-187	0	0	0	0	0	52	0						7.1		67	15	8.1	7.7
187-238	0	0	0	0	0	63	0						6.0		62	20	8.3	7.6
238-265	0	0	0	0	0	54	0						6.9		39	13	8.5	8.1

DEPTH	(ORGANIC MATTER) ORGN CARB	6A1A NITG	C/N	IRON EXT FE	PHOS TOTL	(EXTRACTABLE BASES 5B8A) 6N2E CA	6O2D MG	6P2B NA	6Q2E K	SUM	ACTY 6H1A BACL TPA	AL 6G1F KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NH4C	RATIO 8D1 NH4C TO CLAY	RATIO CA TC MG	CA SAT NH4C ACTY	(BASE SAT) 5F1 5C3 EXTB PCT	5C1 NH4C ACTY PCT
CM	PCT	PCT		PCT	PCT	(- - - - - - - - - - MEQ / 100 G- - - - - - - - - -)									CLAY				
000-015	.54	.046	12	.3		.7	TR	.8							4.8	.79			
015-032	.44	.046	10	.4		1.2	.1	.6		1.8					6.9	.68			
032-057	.45	.053	8	.6		2.1	TR	.7							10.1	.61			
057-076	.38	.047	8	.6	8.5	2.3	.1	.6	11.5	1.6			13.1	11.2	.59	3.7	76	88	103
076-096	.23			.5	7.0	2.0	.1	.5	9.6	1.1			10.7	9.4	.58	3.5	78	90	102
096-120	.17			.5		2.1	.1	.6		1.1				9.8	.56				
120-142	.16			.6		2.8	.1	.7						11.7	.57				
142-159	.14			.6		2.9	.1	.6						11.8	.60				
159-187	.15			.1		1.6	.1	.2						3.9	.17				
187-238	.11			.1		3.6	.1	.2						6.7	.17				
238-265	.08			.2		4.6	.2	.3						7.2	.30				

DEPTH	(SATURATED PASTE) 8R1 REST CHM-	8C1B PH	8A H2O	NA ESP	NA SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A EC MMHOS/CM	(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -) 6A1A CA	6N1B MG	6P1B NA	6Q1B K	6C1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1B NO3	ATTERBERG 4F1 LQID LIMIT	4F2 PLST INDX
CM			PCT	PCT		PPM	PCT	(- - - - - - - - - - MEQ / LITER - - - - - - - - - -)									PCT	
000-015																		
015-032																		
032-057																		
057-076																		
076-096																		
096-120	3600	7.4	29.9				.43											
120-142																		
142-159																		
159-187																		
187-238																		
238-265																		

CLAY MINERALOGY (7A2C).
057-76 MI4 MM3 KK3.
120-142 MI4 KK3 MM2 MC1.
238-265 MT3 CA3 MI2 KK2.
COMMENTS: MM IS POORLY ORDERED, MOSTLY A LOW CHARGE MONTMORILLONITE.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE CA = CALCITE MM = MONTMORILLONITE-MICA
MC = MONTMORILLONITE-CHLORITE.

SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
056-76 VFNS - RE90 QZ88 FE1 TM ZP SP FD10 CL GN HN. FNPS - RE96 QZ95 CD1 FR4 (352 GRAINS).
120-142 VFNS - RE87 QZ85 FE1 TM ZR SP FD12 HN1 PS SO VR.
238-265 VFNS - RE69 QZ66 FE1 ZR1 TM SP CB19 FD11 HN MS GN.
COMMENTS: WEIGHTED AVERAGE OF 94 PCT. RESISTANT MINERALS IN THE BGT.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS CL = CHLORITE FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE QT = QUARTZ
TM = TOURMALINE ZR = ZIRCON FK = POTASSIUM FELDSPAR CF = CARBONATE AGGREGATES CD = CHALCEDONY
SP = SPHENE GN = GARNET SO = STAUROLITE VR = VERMICULITE.

(A) ESTIMATED

Series: Springer.

Pedon Number: S75TX-17-2

Classification: Coarse-loamy, mixed, thermic Udic Paleustalfs. According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 396 meters north on Farm Road 1731 from its intersection with Farm Road 746. Site is 46 meters west of road in native pasture. (Soil Moisture Site #1).

Use and Vegetation: Rangeland - a blue grama, buffalograss community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1200 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None observed.

Slope: Less than 1 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff.

Sampled By: D. Blackstock and G. Threlkeld Date: 10-14-75

A1 - 0 to 15 cm.; brown (7.5YR5/3 dry) or dark brown (7.5YR3.5/3 moist) loamy fine sand; breaks out as very weak coarse subangular blocks which commonly fracture into weak medium and coarse plates; soft, very friable; few roots between plants, roots common beneath them; noncalcareous; neutral; clear wavy boundary. (760249).

B11t - 15 to 32 cm; reddish brown (5YR5/4 dry, 3.5/4 moist) loamy fine sandy; weak coarse subangular blocky structure; slightly hard, friable; few roots; noncalcareous; mildly alkaline; clear wavy boundary. (760250).

B12t - 32 to 57 cm.; reddish brown (5YR5/4 dry, 3.5/4 moist) heavy fine sandy loam; compound weak coarse prismatic and weak coarse subangular blocky structure; hard, friable; few roots; few fine tubular pores; noncalcareous; mildly alkaline; clear wavy boundary. (760251).

B2t - 57 to 76 cm.; reddish brown (6YR5/4 dry, 3.5/4 moist) fine sandy loam; compound weak coarse prismatic and weak medium and coarse subangular blocky structure; very hard, firm; few roots; common fine and very fine tubular pores; noncalcareous; mildly alkaline; clear wavy boundary. (760252).

B11tb - 76 to 96 cm.; reddish brown (5YR5/4 dry, 4/4 moist) fine sandy loam; compound weak coarse prismatic and very weak coarse subangular blocky; very hard, friable; reddish clay coatings on sand grains; krotovina, 15-20 cm. diameter, filled with loose, fine earth; common fine and very fine tubular pores; noncalcareous; mildly alkaline; clear wavy bounary. (760253).

B12tb - 96 to 120 cm.; red (3.5YR5/6 dry, 4/6 moist) fine sandy loam; compound weak coarse prismatic and weak medium subangular blocky; slightly hard, friable; common fine tubular pores; reddish clay coatings on sand grains; krotovina, about 10 cm. wide, extends from horizon above, into and through this horizon, terminating (in cross section) in the horizon below; very few roots (mostly on faces of prisms) except for krotovina, where fine roots are common; noncalcareous; mildly alkaline, clear wavy boundary. (760254).

B2tb - 120 to 142 cm.; red (2.5YR5/6 dry, 3.5/6 moist) sandy clay loam; compound weak coarse prismatic and weak medium and coarse subangular blocky; hard, friable; very few roots; common fine and very fine tubular pores; clay coatings on sand grains; noncalcareous; moderately alkaline; clear wavy boundary. (760255).

B3tcab - 142 to 159 cm.; red (2.5YR5/6 dry, 3.5/6 moist) heavy fine sandy loam; compound weak coarse prismatic and weak coarse subangular blocky; hard, friable; very few roots; carbonate filaments on faces of some prisms, especially in lower part of horizon; common fine and very fine tubular pores; the lower 2 cm. has texture of light sandy clay loam and has carbonate as filaments and grain coatings; most parts of this lower 2 cm. effervesce strongly and a few parts are noncalcareous, remainder of horizon is noncalcareous; moderately alkaline; abrupt smooth boundary. (760256).

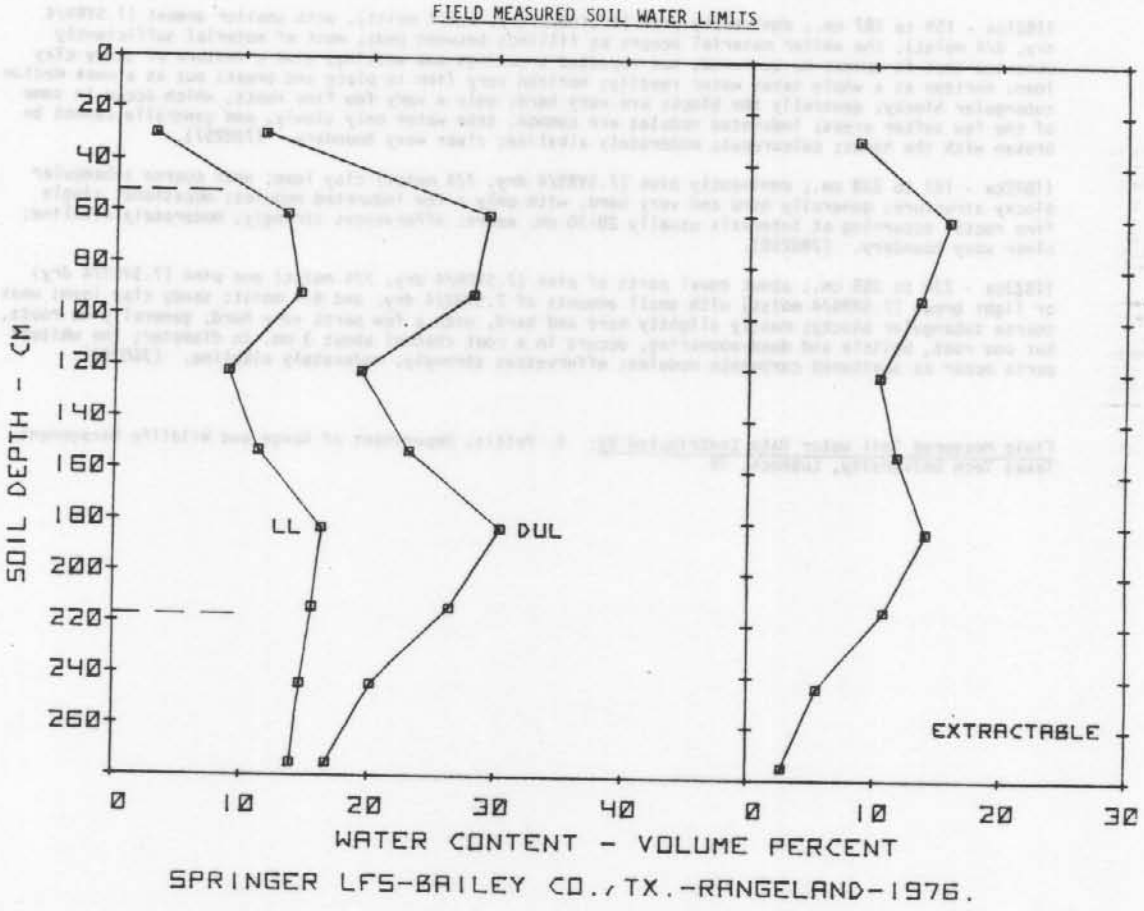
IIB21ca - 159 to 187 cm.; dominantly pink (7.5YR8/4 dry, 6.5/4 moist), with smaller amount (7.5YR9/4 dry, 8/4 moist); the whiter material occurs as fillings between peds; most of material sufficiently cemented that it cannot be textured, but repeated breakings and wettings give a texture of sandy clay loam; horizon as a whole takes water readily; horizon very firm in place and breaks out as a weak medium subangular blocky; generally the blocks are very hard; only a very few fine roots, which occur in some of the few softer areas; indurated nodules are common, take water only slowly, and generally cannot be broken with the hands; calcareous; moderately alkaline; clear wavy boundary. (760257).

IIB22ca - 187 to 238 cm.; dominantly pink (7.5YR9/4 dry, 7/4 moist) clay loam; weak coarse subangular blocky structure; generally hard and very hard, with only a few indurated nodules; occasional single fine roots, occurring at intervals usually 20-30 cm. apart; effervesces strongly; moderately alkaline; clear wavy boundary. (760258).

IIB23ca - 238 to 265 cm.; about equal parts of pink (7.5YR8/4 dry, 7/4 moist) and pink (7.5YR7/4 dry) or light brown (7.5YR6/4 moist) with small amounts of 7.5YR9/4 dry, and 8/4 moist; sandy clay loam; weak coarse subangular blocky; mostly slightly hard and hard, with a few parts very hard; generally no roots, but one root, brittle and dead-appearing, occurs in a root channel about 3 mm. in diameter; the whitest parts occur as scattered carbonate nodules; effervesces strongly; moderately alkaline. (760259).

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.

Pedon Number: S75TX-017-2



SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	2.9	11.6	8.7
61	13.4	29.3	15.9
92	14.5	28.1	13.6
122	8.9	19.3	10.4
153	11.3	23.1	11.8
183	16.3	30.4	14.1
214	15.6	26.4	10.8
244	14.7	20.2	5.5
275	14.0	16.8	2.8

TOTAL WATER EXTRACTED FROM PROFILE = 29.9 Cm.

SOIL CLASSIFICATION- COARSE-LOAMY, MIXED, THERMIC ARIDIC PALEUSTALF

SERIES - - - - - - - SPRINGER TAXADJUNCT

SOIL NO - - - - - - S75TX-17-1   COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B   SAMPLE NOS. 760239-760248

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DECEMBER 1978

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	COS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTF .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -)				FINE (- - - SAND				- - -)	(- - SILT - -)							
		(- - - PCT LT 2MM														- - -) PCT		
000-004	A1	88.6	6.6	4.8	4.1	.2	2.2	13.5	56.1	16.6	3.9	2.7		72.0		85		.50
004-017	B1	84.5	4.8	10.7	10.2	TR	1.9	11.5	51.3	19.8	2.7	2.1		64.7		95		.45
017-037	B21T	82.6	5.1	12.3	11.3	TR	3.3	11.0	42.8	25.5	3.1	2.0		57.1		92		.43
037-054	B22TCA	82.0	4.8	13.2	11.1	.1	2.3	7.8	48.1	23.7	3.0	1.8		58.3		84		.39
054-078	B31TCA	84.0	3.4	12.6	11.4	.1	1.0	4.4	52.8	25.7	1.9	1.5		58.3		90		.39
078-094	B32TCA	85.3	3.5	11.2	10.5	.1	.8	7.6	58.8	18.0	2.0	1.5		67.3		94		.40
094-095	C1																	
095-130	B	81.4	5.3	13.3	11.2	.1	1.9	9.5	45.4	24.5	3.5	1.8		56.9		84		.41
095-130	C2	84.8	3.6	11.6	9.9	TR	3.6	18.1	47.6	15.5	2.5	1.1		69.3		85		.37
130-160	C3&BT	89.3	3.1	7.6	6.9	.1	10.3	26.6	42.3	10.0	1.7	1.4		79.3		91		.46

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1B 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)		(- - - PCT LT 75			- - -)		(BULK DENSITY		)	(- - - WATER CONTENT			- - -)				
000-004	0	0	0	0	0	18	0	1.50B					2.4		0		7.2	6.6
004-017	0	0	0	0	0	24	0	1.54	1.61	.015		10.9	4.8	.09	0		7.2	6.6
017-037	0	0	0	0	0	29	0	1.54	1.62	.017		12.5	5.3	.11	3		7.4	7.0
037-054	0	0	0	0	0	28	0	1.50	1.59	.020		13.5	5.2	.12	TR		8.2	7.6
054-078	0	0	0	0	0	26	0	1.51	1.56	.011		13.1	4.9	.12	TR		8.1	7.7
078-094	0	0	0	0	0	22	0	1.57	1.63	.013		14.1	4.5	.15	TR		8.3	7.7
094-095																		
095-130	0	0	0	0	0	28	0	1.51	1.58	.015		12.3	5.4	.10	TR		8.1	7.6
095-130	0	0	0	0	0	22	0	1.63	1.68	.010		9.9	4.3	.09	TR		8.2	7.7
130-160	0	0	0	0	0	14	0	1.60B					3.5		3		8.1	7.7

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - - MEQ / 100 G								- - -)					
000-004	.47	.043	11	.3		3.6	.7	.0	.4	4.7	.6		5.3	4.2	.88	5.1	86	89	112
004-017	.53	.054	10	.4		6.8	1.1	.0	.5	8.4	1.0		9.4	8.1	.76	6.2	84	89	104
017-037	.33	.032	10	.5		8.1	1.1	TR	.4	9.6	.9		10.5	8.7	.71	7.4	93	91	110
037-054	.16	.023	7	.5			1.0	.0	.4					8.3	.63				
054-078	.24			.5			.9	TR	.3					7.7	.61				
078-094	.11			.4			.9	.1	.3					7.2	.64				
094-095																			
095-130	.00			.5			1.4	.1	.3					8.1	.61				
095-130	.10			.4			1.2	.3	.3					6.4	.55				
130-160	.09			.3			1.6	.1	.3					4.8	.63				

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - - MEQ / LITER							- - -)			
000-004																			
004-017																			
017-037																			
037-054																			
054-078																			
078-094	5800	7.9	25.1					.27											
094-095																			
095-130																			
095-130																			
130-160																			

CLAY MINERALOGY (7A2C).
017-37 MM3 MI3 KK2.
130-210 MI3 MM3 KK2.
COMMENTS: MM IS POORLY ORDERED, MOSTLY A LOW CHARGE MONTMORILLONITE.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA.

SAND MINERALOGY (7B1)   PLACEMENT: SILICEOUS.
017-37 VFNS - RE85 QZ61 FF2 ZR1 TM SP BK FD14 CL CB EP GN. FNES - RE93 QZ89 CD3 FK7 (328 GRAINS).
130-210 VFNS - RE91 QZ88 FF1 TM1 ZR1 SP FD8 TE8 GN.
COMMENTS: WEIGHTED AVERAGE OF 90.4 PCT. RESISTANT MINERALS IN B21T. BORDERLINE TO MIXED FAMILY MINERALOGY.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS CL = CHLORITE EP = EPIDOTE FD = FELDSPARS QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON FK = POTASSIUM FELDSPAR CB = CARBONATE AGGREGATES CD = CHALCEDONY SE = SPHENE
BK = BROOKITE GN = GARNET TE = TREMOLITE.

(A) NO SAMPLE
(B) ESTIMATED

Series: Springer taxadjunct[1/].

Pedon Number: S75TX-17-1

Classification: Coarse-loamy, mixed, thermic Aridic Paleustalfs[1/]. According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 640 meters north on Farm Road 1731 from its intersection with Farm Road 746. Site is 53 meters west of road in native pasture. (Soil Moisture Site #2).

Use and Vegetation: Rangeland - a sideoats grama, purple three-awn communitiy.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1204 meters.

Drainage and Permeability: Well drained and moderately permeable.

Water Table and Duration: None observed.

Slope: Less than 1 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff.

Sampled By: D. Blackstock, R. Pettit, G. Threlkeld Date: 10-13-75

A1 - 0 to 4 cm.; dark reddish brown (5YR3/4 dry, 5YR4/4 moist) fine sand; weak very fine crumb structure; soft, very friable; few roots except beneath plants, where roots are common; noncalcareous; neutral; abrupt smooth boundary. (760239).

B1t - 4 to 17 cm.; dark reddish brown (5YR3/3 dry, 5YR4/4 moist) loamy fine sand; weak coarse prismatic, massive internally; few roots except beneath plants, where roots are common; noncalcareous; neutral; clear wavy boundary. (760240).

B21t - 17 to 37 cm.; red (2.5YR-5YR5/6 dry, 2.5YR-5YR3/6 moist) fine sandy loam; weak coarse prismatic, massive internally; few roots; noncalcareous; moderately alkaline; clear wavy boundary. (760241).

B22tca - 37 to 54 cm.; yellowish red (slightly redder than 5YR5/6 dry, 5YR3/6 moist); fine sandy loam; compound weak coarse prismatic and weak coarse subangular blocky structure; few roots; common very fine tubular pores; common carbonate filaments on ped faces and in pores; most parts calcareous, a few spots noncalcareous; moderately alkaline; clear wavy boundary. (760242).

B31tca - 54 to 78 cm.; yellowish red (5YR5/6 dry, and 5YR4/6 moist) loamy fine sand; compound very weak coarse prismatic and very weak medium subangular blocky structure; slightly hard, very friable; few roots; few carbonate filaments on ped faces; calcareous; moderately alkaline; clear wavy boundary. (760243).

B32tca - 78 to 94 cm.; yellowish red (5YR5/6 dry, 4/6 moist) light loamy fine sand; massive; slightly hard, very friable; few roots; very few carbonate filaments; calcareous; moderately alkaline, abrupt smooth boundary. (760244).

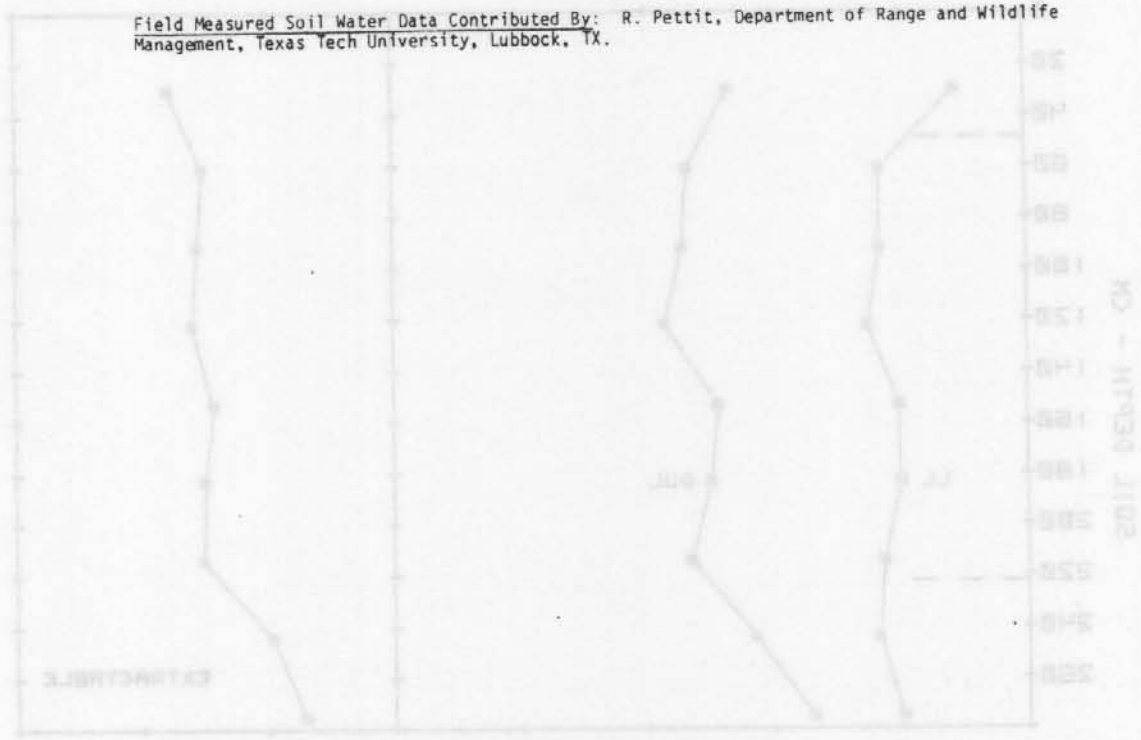
C1 - 94 to 95 cm.; reddish yellow (7.5YR8/6 dry, 7.5YR6/6 moist) fine sand; massive and single grain; soft and loose; very few roots; calcareous; moderately alkaline; abrupt smooth boundary.

B & C2 - 95 to 130 cm.; yellowish red (5YR5/6 dry, 5YR4/6 moist) loamy fine sand; massive; slightly hard, very friable; very few roots; consists of material generally without macroscopic stratification (designated B material), dominant in upper and lower parts of the horizon, and material with macroscopic stratification (designated C material) dominant in the center of the horizon; very few carbonate filaments; calcareous; moderately alkaline; clear wavy boundary. (760246, 247).

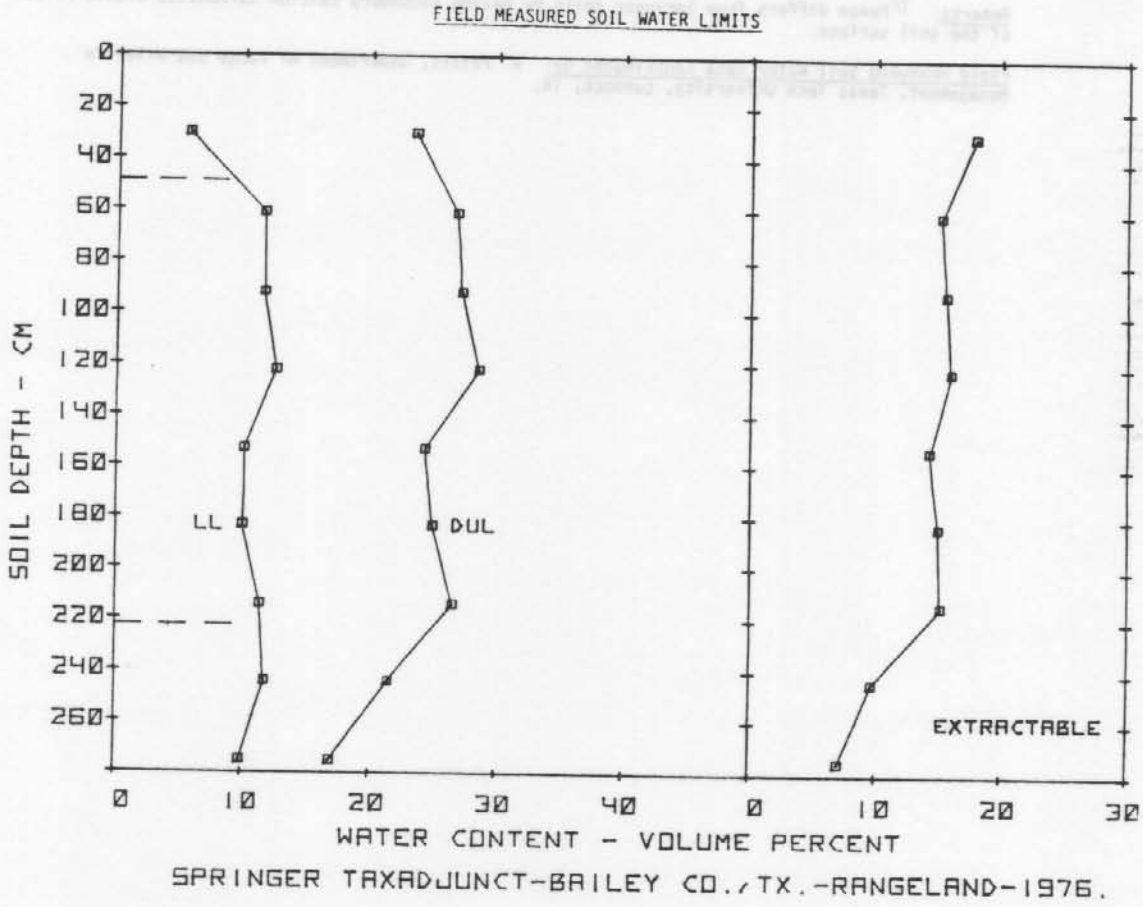
C3 & Bt - 130 to 210 cm.; yellowish red (5YR5/6 dry, 4/6 moist); alternating zones of (1) light fine sandy loam, commonly ranging from 5 to 10 cm. thick in which strata cannot be seen or are faintly visible and (2) coarser-textured material (loamy fine sand and fine sand) in which strata 1-2 mm. thick are evident; massive; slightly hard, very friable; very few roots; noncalcareous except for occasional strata of sand, 0.5-1 cm. thick, which effervesce weakly; moderately alkaline. (760248).

Remarks: 1/ Pedon differs from Springer soils by having secondary calcium carbonates within 90 cm. of the soil surface.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.



Pedon Number: S75TX-017-1



SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	5.6	23.5	17.9
61	11.6	26.8	15.2
92	11.6	27.2	15.6
122	12.6	28.6	16.0
153	10.1	24.4	14.3
183	10.0	25.0	15.0
214	11.4	26.6	15.2
244	11.8	21.5	9.7
275	9.9	17.0	7.1

TOTAL WATER EXTRACTED FROM PROFILE = 41.2 Cm.

SOIL CLASSIFICATION- LOAMY, MIXED THERMIC ARENIC ARIDIC HAPLUSTALF

SERIES - - - - - - -TIVOLI (PHASE)

SOIL NO - - - - - - S75TX-17-8 COUNTY - - - BAILEY

GENERAL METHODS- - -1A,1B1B,2A1,2B

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SAMPLE NOS. 760637-760645

DECEMBER 1978

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	COS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -)																
		(- - - PCT LT 2MM - - -)																
000-012	A1	91.9	3.9	4.2	1.0	.3	5.9	23.6	49.6	12.5	3.6	.3		79.4		28		.48
012-031	E1	94.4	1.7	3.9	.5	.1	5.9	24.0	49.9	14.5	1.4	.3		79.9		13		.41
031-061	B21	95.3	.8	3.9	.8	TR	7.5	26.0	50.2	11.6	.6	.2		83.7		21		.41
061-084	B22	96.3	1.6	2.1	.4	TR	5.6	24.4	51.9	14.4	1.3	.3		81.9		19		.71
084-112	B31	96.5	1.3	2.2	1.3	TR	4.2	22.7	53.9	15.7	.9	.4		80.8		59		.45
112-151	B32	95.0	3.0	2.0	.4	TR	3.1	19.1	55.3	17.5	2.8	.2		77.5		20		.40
151-168	B1B	95.2	3.0	1.8	.4	TR	3.4	22.3	55.0	14.5	2.6	.4		80.7		22		.50
168-182	B21TB	80.3	5.9	13.8	8.7	.0	2.6	14.4	46.6	16.7	4.0	1.9		63.6		63		.41
182-206	B22TB	82.5	7.6	9.9	6.2	TR	2.9	15.1	45.0	19.5	5.6	2.0		63.0		63		.43

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1F 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)		(- - - PCT LT 75 - - -)					(BULK DENSITY)			(- - -WATER CONTENT- - -)							
000-012	0	0	0	0	0	14	0				6.2A		2.0		TR		7.1	6.7
012-031	0	0	0	0	0	12	0				3.9A		1.6		0		6.8	6.4
031-061	0	0	0	0	0	10	0				4.7A		1.6		0		7.1	6.2
061-084	0	0	0	0	0	9	0				3.0A		1.5		0		6.9	5.9
084-112	0	0	0	0	0	9	0				3.3A		1.0		0		6.6	5.9
112-151	0	0	0	0	0	14	0				3.7A		.8		0		7.0	6.0
151-168	0	0	0	0	0	10	0				4.0A		.9		0		6.9	6.3
168-182	0	0	0	0	0	28	0				20.1A		5.7		0		6.9	6.4
182-206	0	0	0	0	0	27	0				16.3A		4.3		0		6.1	5.6

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	6N2E CA	6O2D MG	6P2E NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	CAT EXCH 5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	BASE SAT 5C1 NHAC PCT
						(- -EXTRACTABLE BASES 5B4A- -)													
						(- - - MEQ / 100 G - - -)													
000-012	.44	.056	8	.2			.6	TR	.3		.4			3.5	.83				
012-031	.24	.038	6	.2		2.0	.4	TR	.2	2.6	.4		3.0	2.3	.59	5.1	87	87	113
031-061	.16	.020	8	.2		1.7	.4	TR	.2	2.3	.4		2.7	2.2	.56	4.3	77	85	105
061-084	.10	.015	7	.2		1.3	.3	TR	.2	1.8	.2		2.0	1.9	.58	4.3	68	90	95
084-112	.07			.2		1.0	.4	TR	.1	1.5	.3		1.8	1.4	.47	2.5	71	83	107
112-151	.04			.2		1.0	.3	TR	.1	1.4	.1		1.5	1.4	.45	3.3	71	93	100
151-168	.04			.2		1.1	.4	TR	.2	1.7	.1		1.8	1.5	.48	2.8	73	94	113
168-182	.13			.4		5.7	1.8	TR	.4	7.9	1.4		9.3	8.1	.59	3.2	70	85	98
182-206	.07			.3		4.4	1.4	.1	.3	6.2	1.1		7.3	6.2	.63	3.1	71	85	100

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	ATTERBERG 4F2 PLST INDX
									(- - - SATURATION EXTRACT 8A1 - MEQ / LITER - - -)										
000-012																			
012-031																			
031-061																			
061-084																			
084-112	24000	7.2	22.6					.17											
112-151																			
151-168																			
168-182																			
182-206																			

CLAY MINERALOGY (7A2C).
031-61 MI3 KK2 MM1.
168-182 MM3 MI/ KK3.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE MM = MONTMORILLONITE-MICA.
SAND MINERALOGY (7B1) PLACEMENT: SILICEOUS.
031-61 VFNS - RE88 QZ85 FE2 TM -ZR SP FD11 MS GN. FNES - RE94 QZ91 CD3 FK6 (347 GRAINS).
168-182 VFNS - RE86 QZ83 FE2 ZR1 TM SP FD14 GN.
COMMENTS: WEIGHTED AVERAGE OF 94 PCT. RESISTANT MINERALS IN THE B21.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: RE = RESISTANT MINERALS FD = FELDSPARS MS = MUSCOVITE QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON
FK = POTASSIUM FELDSPAR CD = CHALCEDONY SP = SPHENE GN = GARNET.

(A) METHOD 4B1A

Series: Tivoli[1/].

Pedon Number: S75TX-17-8

Classification: Loamy, mixed, thermic Arenic Aridic Haplustalfs[1/].According to the Texas Soil Survey Staff.

Location: Bailey County, Texas: About 1.1 miles north on Farm Road 1731 from its intersection with Farm Road 746. Site is 244 meters east of road in native pasture. (Soil Moisture Site #8).

Use and Vegetation: Rangeland - a sumac, red lovegrass community.

Parent Material: Noncalcareous eolian sediments.

Region: Southern High Plains - MLRA 77.

Position: Upland.

Elevation: About 1200 meters.

Drainage and Permeability: Excessively drained and rapidly permeable.

Water Table and Duration: None observed.

Slope: About 4 percent.

Described By: L. H. Gile; Revised by the Texas Soil Survey Staff

Sampled By: L. H. File Date: 11-8-75

A1 - 0 to 12 cm.; brown (7.5YR5/4 dry) or dark brown (7.5YR3/4 moist) sand; massive; soft, very friable, some parts loose; fine roots common; noncalcareous; moderately alkaline; abrupt wavy boundary. (760637).

B1 - 12 to 31 cm.; dominantly light brown (7.5YR6/4 dry) or brown (7.5YR5/4 moist) with some parts slightly darker as in the A1, and some slightly redder as in the B21; sand; massive; slightly hard, very friable; few roots; noncalcareous; moderately alkaline; clear wavy boundary. (760638).

B21 - 31 to 61 cm.; yellowish red (5YR5.5/6 dry, 5YR4/6 moist) fine sand; massive; slightly hard, very friable; few roots, mostly 1 to 2 mm. diameter, but several up to 5 cm. diameter; scattered krotovinas, with one being diagonal, about 35 cm. long and 10 cm. wide, filled with loose material including sand, fecal pellets and fine roots; noncalcareous; moderately alkaline; clear wavy boundary. (760639).

B22 - 61 to 84 cm.; reddish yellow (5YR6/6 dry) or yellowish red (5YR4/6 moist) fine sand, massive, slightly hard, very friable; few roots, mostly 1 to 2 mm. diameter, but several 8 to 10 diameter; several krotovinas, with the longest being diagonal, about 45 cm. long and 10 cm. wide, most of which is tightly packed with fine sand which is lighter in color than the main part of the horizon; organic material, fecal pellets, and loose sand occur along the lower margin and the east end of the krotovina; noncalcareous; moderately alkaline; clear wavy boundary. (760640).

B31 - 84 to 112 cm.; reddish yellow (6YR6/6 dry) or yellowish red (6YR4/6 moist) fine sand; massive, slightly hard, very friable; very few roots; noncalcareous; moderately alkaline; clear wavy boundary. (760641).

B32 - 112 to 151 cm.; reddish yellow (6YR6/6 dry) or yellowish red (6YR4/6 moist) fine sand; massive; slightly hard, very friable; very few roots; noncalcareous; moderately alkaline; abrupt wavy boundary. (760642).

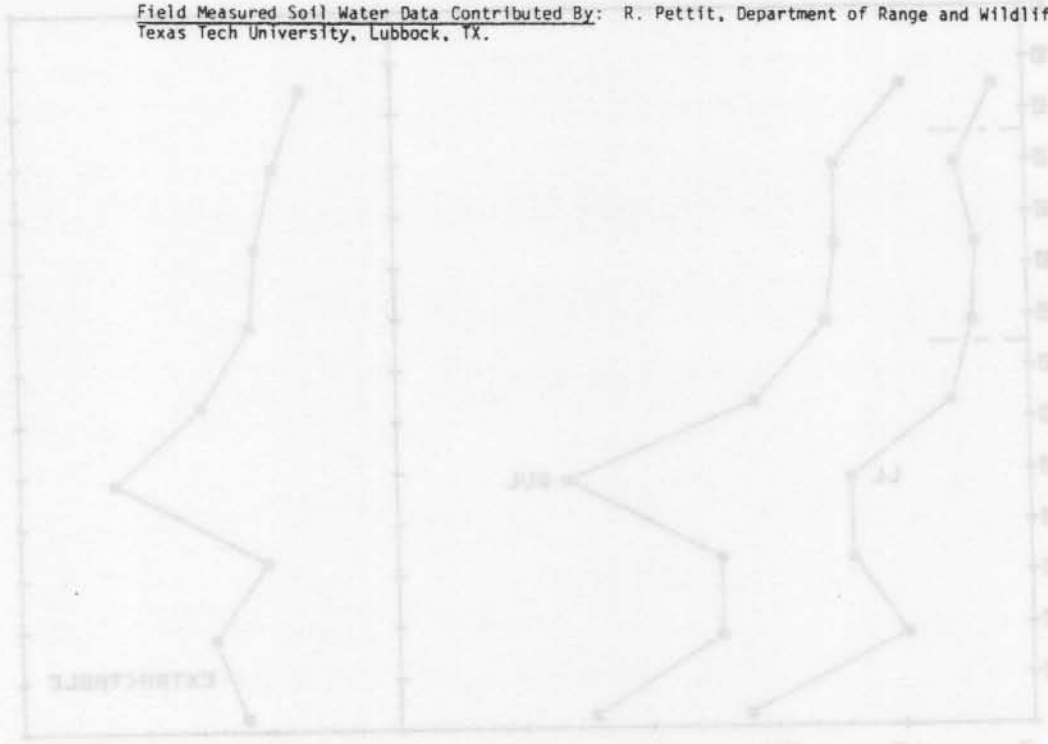
B1b - 151 to 168 cm.; dominantly light reddish brown (5YR6/4 dry) or reddish brown (5YR5/4 moist) with parts 5YR6/6 dry; fine sand; massive, slightly hard, very friable; very few roots; noncalcareous; moderately alkaline; abrupt smooth boundary. (760643).

B21tb - 168 to 182 cm.; reddish brown (5YR5/4 dry, 5YR4/4 moist) fine sandy loam; very hard, friable; compound very weak coarse prismatic and weak coarse subangular blocky structure; very few roots, about 1 mm. and less in diameter; moderately alkaline; noncalcareous; clear wavy boundary. (760644).

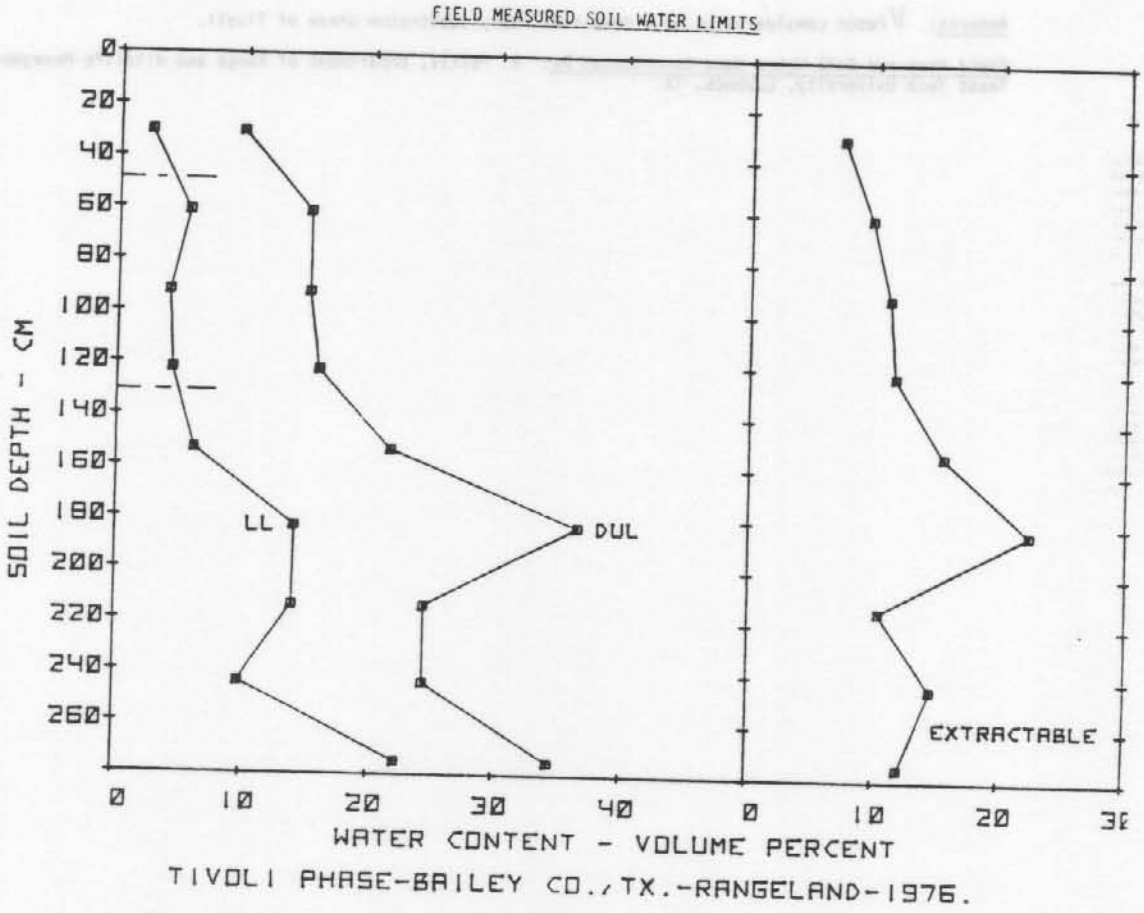
B22tb - 182 to 206 cm.; yellowish brown (9YR5/4 dry) or dark yellowish brown (9YR4/4 moist) with a few parts of 5YR hue; loamy fine sand; very hard, friable; compound very weak coarse prismatic and very weak coarse subangular blocky structure; very few roots, 1 mm. and less in diameter; noncalcareous; neutral. (760645).

Remarks: 1/ Pedon considered to be a deep over loamy substratum phase of Tivoli.

Field Measured Soil Water Data Contributed By: R. Pettit, Department of Range and Wildlife Management, Texas Tech University, Lubbock, TX.



Pedon Number: S75TX-017-8



TIVOLI PHASE-BAILEY CO., TX.-RANGELAND-1976.

SOIL DEPTH (cm)	LL	DUL	EXTRACTABLE
	Volume Percent Water		
30	2.4	9.7	7.3
61	5.5	15.1	9.6
92	4.0	15.1	11.1
122	4.3	15.9	11.6
153	6.1	21.6	15.5
183	14.1	36.5	22.4
214	14.0	24.4	10.4
244	9.8	24.4	14.6
275	22.3	34.4	12.1

TOTAL WATER EXTRACTED FROM PROFILE = 36.2 Cm.

VENUS I

CLASSIFICATION: FINE-LOAMY, MIXED, THERMIC TYPIC HAPLUSTOLL

S 81TX-027-001 SAMPLE NOS. 81P1562 - 1568 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION STUDY

GENERAL METHODS 1B1a, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	>75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81562	15	0- 13	AP	10.2	23.8	66.2			3.7	14.9	35.4	27.0	2.8	0.8	0.2	TR	TR	--	31	TR
81563	25	13- 20	A12	17.7	29.2	53.1			8.8	22.6	26.4	14.2	5.2	1.9	0.4	TR	--	--	27	TR
81564	35	20- 56	A13	28.1	33.7	38.2			12.6	21.1	17.0	11.5	6.8	2.4	0.5	TR	TR	--	21	TR
81565	45	56- 76	B21	33.1	34.6	33.3			12.6	22.0	16.4	10.3	5.5	2.2	0.9	TR	TR	--	19	TR
81566	55	76-130	B22	30.5	30.4	39.6		1	18.8	20.1	13.8	7.7	4.7	2.5	1.9	2	TR	--	18	2
81567	65	130-173	C1A	25.6	30.2	44.2		1	14.4	15.8	13.2	14.1	8.4	6.9	3.1	3	3	--	35	6
81568	75	173-208	C	5.7	5.6	88.7		1	2.8	2.8	3.6	14.4	39.7	21.5	9.5	4	4	--	86	8

SAMPLE NO.	HZN NO.	TOTAL C 6A1L	TOTAL N 6B3A	EXTR P	TOTAL S	DITH-CIT EXTRACTABLE FE 6G2B	AL 6G7A	MN 6D2A	RATIO/CLAY CEC 8D1	15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	PI 4P	BULK DENSITY FIELD 1/3 BAR 4A1C	OVEN DRY 4A1H	WHOLE SOIL 4D1	CLOD 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2A	WHOLE SOIL 4C1
		<- - - - - - PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->		CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81562	1	0.40							0.74	0.41			1.60			6.2			4.2	
81563	2	0.55							0.75	0.41			1.67	1.78	0.021	11.3	22.6	16.3	7.2	0.15
81564	3	0.60							0.79	0.43			1.57	1.76	0.043	17.3	25.3	20.5	12.2	0.13
81565	4	0.61							0.73	0.42			1.63	1.82	0.037	18.1		17.6	12.5	0.08
81566	5	0.43							0.64	0.39			1.61	1.85	0.047	17.0		14.6	11.9	0.11
81567	6	0.23							0.51	0.35			1.60	1.71	0.022	13.8		10.4	8.9	0.02
81568	7	0.08							0.46	0.35			1.60			3.4			2.0	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6Q2D	NA 5B5A 6P2B	K 5B5A 6W2B	SUM BASES	ACID-EXTR ITY 6H5A	AL 6G9A	CEC SUM CATS 5A3A	NH4- OAC 5A8B	BASES + AL 5A3B	BASE SAT SUM 5G1	NH4 OAC 5C3	CACO3 EQUIV <2MM 6E1C	LIMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	H2O 1:2 8C1F
		<- - - - - - - - - - - - -MEQ / 100 G - - - - - - - - - - - ->										<- - - - -PCT - - - ->						
81562	1		0.6	--	0.4					7.5				3			7.4	8.3
81563	2		0.7	TR	0.4					13.2				1			7.5	8.2
81564	3	22.8	0.8	0.1	0.6	24.3	0.0		24.9	22.1		98	100	TR			7.5	8.1
81565	4		0.9	0.1	0.6					22.0				1			7.6	8.3
81566	5		1.0	TR	0.5					19.5				12			7.7	8.3
81567	6		1.0	TR	0.4					13.1				23			7.7	8.4
81568	7		0.5	--	0.1					2.6				27			7.8	8.6

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY 7A2I	7A2I	7A2I	7A2I	-DTA- 7A3	7A3	TOT ANL CLAY <2U K2O 6Q3A	Fe 6C7A
		<- RELATIVE AMOUNTS ->						<- - - - -PCT - - - ->	
81562	1								
81563	2								
81564	3								
81565	4								
81566	5	MI 3	MI 2	KK 2	QZ 2	KK12		2.2	4.5
81567	6								
81568	7								

ESTIMATED BULK DENSITY FOR LAYER 1, 7,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE QZ QUARTZ

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Venus taxadjunct[1/].

Pedon Number: S81TX-027-1

Classification: Fine-loamy, mixed, thermic Typic Haplustolls[1/].

Location: Bell County, Texas: 0.67 mile northwest on County Road 436 from its intersection with the Leon River, then 0.76 mile north-northeast on paved road to gate. Site is 255 meters east-southeast on field road and 12 meters south in cultivated field.

Use and Vegetation: Cropland - fallow when described - previous crop was grain sorghum.

Parent Material: Loamy alluvium.

Region: Grand Prairie - MLRA 85.

Position: High Terrace.

Elevation: ----------

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None observed.

Slope: less than 1 percent. Slightly convex.

Sampled and Described By: Larry F. Ratliff Date: 2-19-81

Ap - 0 to 13 cm.; dark grayish brown (10YR4/2) very fine sandy loam; massive; slightly hard, very friable; few fine and very fine roots; strong effervescence, moderately alkaline; abrupt smooth boundary. (811582).

A12 - 13 to 20 cm.; very dark grayish brown (10YR3/2) very fine sandy loam; massive and slightly compact; slightly hard; very friable; few fine and very fine roots; few streaks of (10YR4/2) fine sandy loam; strong effervescence, moderately alkaline; clear smooth boundary. (811583).

A13 - 20 to 56 cm.; very dark grayish brown (10YR3/2) light clay loam; moderate medium prismatic parting to moderate medium subangular blocky structure; slightly hard, friable; few fine and medium roots; few fine and medium pores; slight effervescence, moderately alkaline; gradual wavy boundary. (811584).

B21 - 56 to 76 cm.; dark brown (7.5YR3/4) clay loam; strong medium prismatic parting to moderate medium subangular blocky structure; hard, firm; few fine and very fine roots; few fine pores; few thin and patchy clay films on vertical faces of peds; few fine soft masses of CaCO3; strong effervescence, moderately alkaline; gradual wavy boundary. (811585).

B22 - 76 to 130 cm.; brown (7.5YR4/4) clay loam; moderate medium prismatic parting to moderate medium subangular blocky structure; hard, firm; few fine roots and pores; few thin and patchy clay films on vertical faces of peds; few fine soft masses and few fine concretions of CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (811586).

Cca - 130 to 173 cm.; brown (7.5YR4/4,5/4) heavy loam; percentage clay decreases with depth; weak medium prismatic structure parting to weak medium subangular blocky structure; hard, friable; few fine and medium pores; common soft masses and few fine concretions of CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (811587).

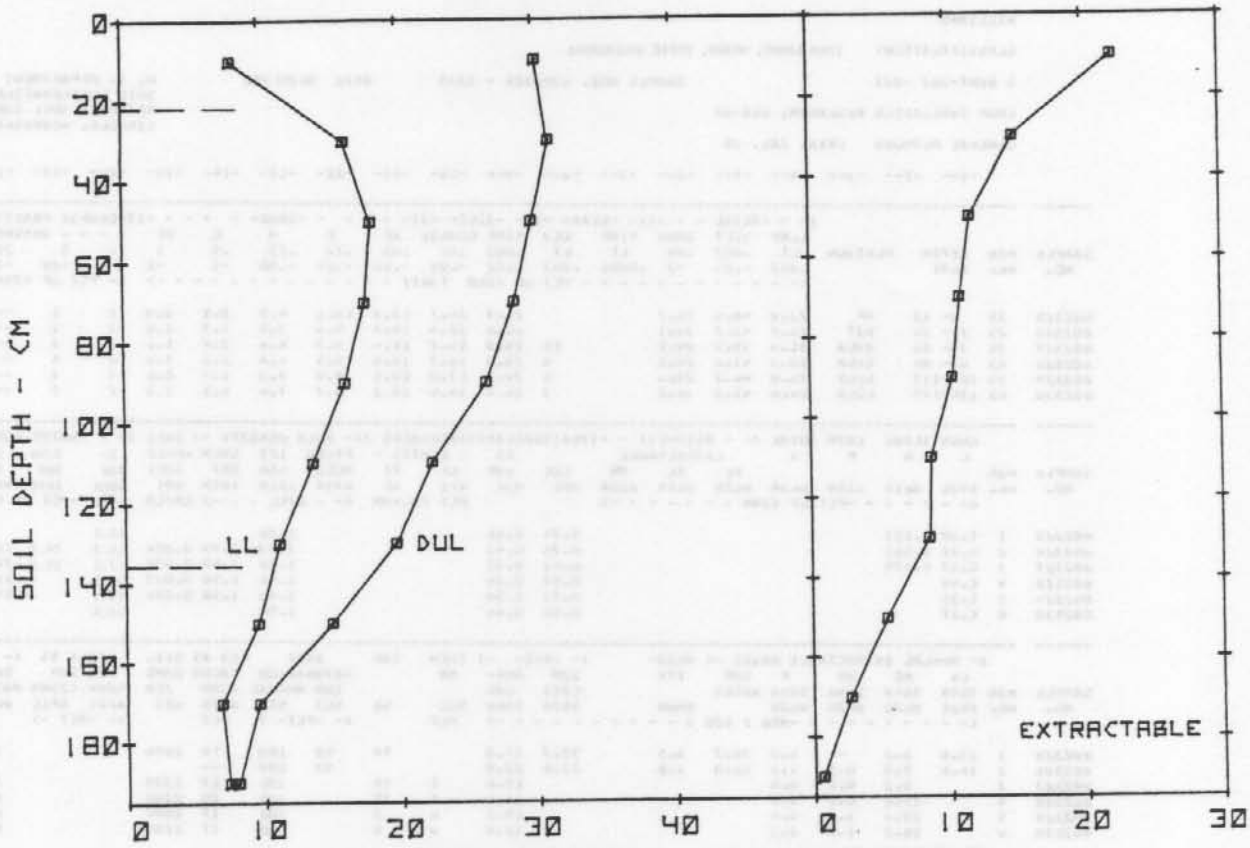
C - 173 to 208 cm.; strong brown (7.5YR5/6) coarse sand; single grain; loose; very friable; few soft masses CaCO3; about 5 percent by volume of rounded quartz gravel mostly less than 1.5 cm. in diameter; strong effervescence, strongly alkaline. (811588).

Remarks: [1/]The calcic horizon is below a depth typical for Venus soils. The Ap and A12 horizons appear to be recent deposits presumably from adjacent uplands. Roots are mostly along vertical ped faces. Colors are for moist soil. No core samples could be collected for the Ap or C horizons.

Field Measured Soil Water Data Contributed By: P. J. Shouse, Blackland Research Center, Temple, Texas.

Pedon Number: S81TX-027-1

FIELD MEASURED SOIL WATER LIMITS



VENUS TAXADJ.-BELL CO.,TX.-GRAIN SORGHUM-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
10	8.0	30.2	22.2
30	16.2	31.1	14.9
50	18.1	29.8	11.7
70	17.6	28.5	10.9
90	16.1	26.4	10.3
110	13.7	22.4	8.7
130	11.2	19.7	8.5
150	9.6	15.0	5.4
170	6.9	9.6	2.7
190	7.4	8.0	0.6

TOTAL WATER EXTRACTED FROM PROFILE = 19.2 Cm.

WILLIAMS

CLASSIFICATION: FINE-LOAMY, MIXED, TYPIC ARGIBOROLL

S 80MT-083 -001 SAMPLE NOS. 80P2325 - 2330 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002 <- PCT OF <2MM (3A1) ->	TOTAL SILT .002 -.05	TOTAL SAND .05 -2	CLAY FINE .0002	CLAY CO3 LT .002	SILT FINE .002 -.02	SILT COARSE .02 -.05	SAND VF .05 -.10	SAND F .10 -.25	SAND M .25 -.50	SAND C .5 -1	SAND VC 1 -2	COARSE FRACTIONS(MM) WEIGHT 2- -5	5 -20	20 -75	>2MM .1- 75	WT PCT OF WHOLE SOIL
802325	1S	0- 13	AP	22.9	46.4	30.7			21.7	24.7	13.3	10.1	4.3	2.1	0.9	1	1	--	19	2
802326	2S	15- 30	B2T	26.7	43.2	30.1			20.8	22.4	14.4	5.4	3.6	1.7	1.0	2	1	--	18	3
802327	3S	38- 53	B3CA	31.4	39.5	29.1		11	24.8	14.7	11.4	5.7	4.4	2.4	1.2	2	3	--	22	5
802328	4S	66- 84	C1CA	30.7	41.0	28.1		6	24.3	16.7	10.6	9.5	4.4	2.2	1.4	2	4	--	22	6
802329	5S	102-117	C2CA	28.8	46.2	25.0		4	29.2	17.0	10.5	8.9	3.3	1.7	0.6	1	3	--	18	4
802330	6S	130-145	C2CA	24.6	41.2	34.2		2	26.6	14.6	10.3	9.7	7.4	4.5	2.5	2	7	--	31	9

SAMPLE NO.	HZN NO.	ORGN C 6A1C <- PCT OF <2MM ->	TOTAL N 6B1B	EXTR P 6S1A	TOTAL S 6A3A	EXTRACTABLE FE 6G2B	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6G2A	CEC 8D1	15 BAR 8D1	LIMITS - LL 4F1 PCT	LIMITS - PI 4F <0.4MM	FIELD MOIST 4A3A <- G/CC ->	1/3 BAR 4A1D	OVEN DRY 4A1H	WHOLE SOIL 4D1 CM/CM	BAR 4B1A	BAR 4B1C	1/3 BAR 4B1C	15 BAR 4B2	WHOLE SOIL 4C1 CM/CM
802325	1	1.30	0.101						0.74	0.41			1.30				15.2			9.5	
802326	2	0.87	0.081						0.75	0.42			1.33	1.44	0.026		16.3	24.9	21.0	11.1	0.13
802327	3	0.83	0.079						0.43	0.33			1.28	1.40	0.030		17.2	25.9	20.8	10.4	0.13
802328	4	0.48							0.47	0.36			1.41	1.56	0.033		16.5		18.6	11.0	0.10
802329	5	0.35							0.52	0.39			1.46	1.58	0.026		17.9		19.5	11.3	0.12
802330	6	0.37							0.50	0.48			1.50				15.6			11.9	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E4A <- MEQ / 100 G ->	MG 5B4A	NA 5E4A	K 5B4A	SUM BASES 6Q2B	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-OAC 5A6A	EXCH NA 5D2 PCT	SAR 5E	BASE SATURATION SUM 5C3 <- PCT ->	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1B PCT	RES. OHMS /CM 6E1	GASG4 AS GYPSUM <2MM 6F1C <- PCT ->	GASG4 AS GYPSUM <20MM 6F1C	SAT PASTE 8C1B	CACL2 .01M 8C1E 1:2	H2O 8C1A 1:1
802325	1	23.8	5.2	--	1.2	30.2	0.5	30.7	17.0		TR	98	100	TR	2600			7.6	7.5	7.9
802326	2	14.6	5.5	0.3	1.2	22.0	1.6	23.6	20.0			93	100	--					7.0	7.5
802327	3		8.2	0.1	0.4				13.6	1	TR		100	23	2300			7.7	7.7	8.1
802328	4		15.1	0.2	0.4				14.6	1	TR		100	20	2200			8.0	7.9	8.4
802329	5		20.2	1.2	0.4				15.3	6	5		100	17	2000			8.4	8.3	8.9
802330	6		15.2	1.2	0.3				12.4	4	6		100	17	2200			8.5	8.4	9.1

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B <- MEQ / LITER ->	MG 6D1B	NA 6P1B	K 6W1B	CO3 6T1B	HCO3 6J1C	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 4A <- PCT ->	TOTAL SALTS EST. 8D5 MMHOS /CM	ELEC. COND. 8A1A	MINERALOGY CLAY X-RAY <- RELATIVE AMOUNTS -> 7A2B	7A2B	7A2B	DTA <2U 7A2B	<2U 7A3	TOT ANL 7C3 CLAY <- PCT -> 7A3	K2O 603A	Fe 6C7A
802325	1	3.9	1.6	0.1	0.7	--	4.0	0.1	0.5	0.1	40.4	TR	0.55								
802326	2												0.17	MT 4	MI 3	KK 3	CL 1	KK12		2.5	5.8
802327	3	2.7	2.3	0.2	0.3	--	2.7	0.1	0.5	0.6	47.3	TR	0.54								
802328	4	1.1	2.5	0.7	0.2	--	3.4	0.1	0.5	0.2	48.4	TR	0.47	MT 3	MI 2	KK 2	CA 2	KK 9		1.9	4.7
802329	5	0.2	1.5	4.3	0.1	--	4.2	0.2	1.0	0.2	51.6	TR	0.58								
802330	6	0.2	1.4	5.2	0.1	--	4.6	0.1	1.1	0.3	45.7	TR	0.64	MT 4	MI 3	KK 3	CL 2	KK12		2.5	5.5

ESTIMATED BULK DENSITY FOR LAYER 1, 6.

MMHOS/CM OF 1:2 WATER EXTRACT (8A1) FOR LAYERS 2,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE CL CHLORITE CA CALCITE

RELATIVE AMOUNT 6 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Williams.

Pedon Number: S80MT-083-1

Classification: Fine-loamy, mixed Typic Argiborolls.

Location: Richland County, Montana: 780 meters south and 240 meters east of the NW corner of Sec. 11, T.23N., R.58E. Rasmussan Research Site.

Use and Vegetation: Presently fallow - previously cropped to Spring wheat.

Parent Material: Glacial till.

Region: Northern Dark Brown Glaciated Plain - MLRA 53A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, moderate to moderately slow permeability.

Water Table and Duration: None.

Slope: Less than 1 percent.

Sampled and Described By: Larry F. Ratliff Date: 8-19-80

Ap - 0 to 13 cm.; very dark grayish brown (10YR3/2) loam, dark grayish brown (10YR4/2) dry; weak fine granular structure; slightly hard, very friable; common fine and very fine roots; few small pebbles; moderately alkaline; clear smooth boundary. (802325).

B2t - 13 to 33 cm.; dark brown (10YR3/3) clay loam, brown (10YR4/3) dry; moderate medium prismatic parting to weak fine and medium subangular blocky structure; slightly hard, friable; common fine roots and pores; thin patchy clay films on vertical faces of prisms; 2 to 3 percent by volume small (<1 cm.) pebbles; mildly alkaline; gradual smooth boundary. (802326).

B3ca - 33 to 64 cm.; brown (10YR5/3) clay loam, pale brown (10YR6/3) dry; weak fine prismatic parting to weak fine and medium subangular blocky structure; slightly hard, friable; few fine roots; many fine pores; few thin and patchy clay films on vertical faces of prisms; 3 to 5 percent by volume small pebbles; 15 to 20 percent by volume of threads and soft masses $CaCO_3$; strong effervescence, moderately alkaline; gradual wavy boundary. (802327).

C1ca - 64 to 102 cm.; light olive brown (2.5Y5/4) clay loam, light yellowish brown (2.5Y6/4) dry; weak fine prismatic structure; hard, friable; few fine roots; common fine and medium pores; 2 to 6 percent by volume small pebbles; 15 to 20 percent by volume of threads and soft masses $CaCO_3$; strong effervescence, moderately alkaline; gradual wavy boundary. (802328).

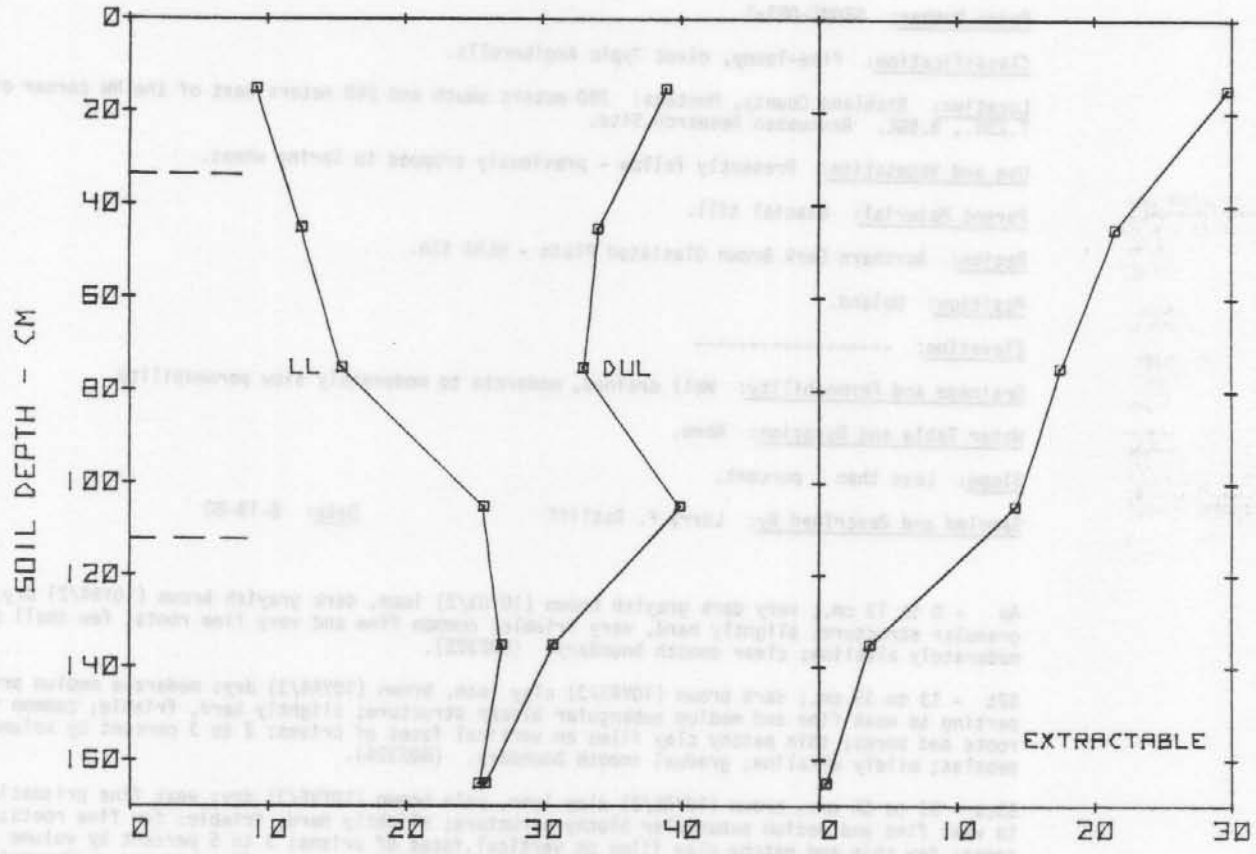
C2ca - 102 to 150 cm.; light olive brown (2.5Y5/4) clay loam, light yellowish brown (2.5Y6/4) dry; massive; hard, firm; few fine pores; 5 to 10 percent by volume of silica pebbles, percentage increasing with depth; 15 to 20 percent by volume of threads, masses and concretions $CaCO_3$; strong effervescence, strongly alkaline. (802329, 330).

Remarks: Percentage pebbles increases with depth and samples could not be obtained below 150 cm.

Field Measured Soil Water Data Contributed By: F. H. Siddoway, USDA-AR, Northern Plains Soil and Water Research Center, Sidney, Montana.

Pedon Number: S80MT-083-1

FIELD MEASURED SOIL WATER LIMITS



WILLIAMS L-RICHLAND CO./MT.-SP.WHEAT-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	9.2	38.9	29.7
45	12.5	34.0	21.5
75	15.4	32.9	17.5
105	25.7	39.9	14.2
135	27.0	30.7	3.7
165	25.3	25.8	0.5

TOTAL WATER EXTRACTED FROM PROFILE = 26.1 Cm.

WILLIAMS

CLASSIFICATION: FINE-LOAMY, MIXED, TYPIC ARGIBOROLL

S 80P1-083 -002 SAMPLE NOS. 80P2331 - 2337 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002 (PCT OF <2MM)	TOTAL SILT .002-.05 (PCT OF <2MM)	TOTAL SAND 2-.05 (PCT OF <2MM)	CLAY FINE LT .0002 (PCT OF <2MM)	CLAY CO3 FINE LT .002 (3A1)	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .10-.25	SAND F .25-.50	SAND M .50-1	SAND C 1-2	SAND VC 2-5	GRAVEL 5-20	GRAVEL 20-75	>75MM (3B1)	WHOLE SOIL
802331	1S	0- 13	A1	14.2	33.1	52.7		16.3	16.8	10.0	18.9	16.5	6.2	1.1	1	1	--	44	2
802332	2S	13- 30	B21	22.5	32.8	44.7		14.6	18.2	10.9	16.4	11.8	4.4	1.2	2	7	3	42	12
802333	3S	30- 38	B22A	NO SAMPLE											--	--	--		--
802334	4S	38- 53	C1CA	32.4	33.1	34.5	5	20.6	12.3	9.2	11.8	8.2	3.6	1.7	2	8	5	37	15
802335	5S	69- 84	C2CA	25.8	34.6	39.6	7	22.1	12.5	8.4	14.8	10.4	4.4	1.6	2	3	3	37	8
802336	6S	102-114	C3	22.1	32.5	45.4	3	20.1	12.4	9.9	16.9	11.8	4.9	1.9	2	5	3	42	10
802337	7S	130-140	C3	22.1	33.1	44.8	3	20.1	13.0	9.5	16.8	11.2	5.1	2.2	2	11	--	44	13

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C (PCT OF <2MM)	TOTAL N 6B1B (PCT OF <2MM)	EXTR TOTAL P 6A1A (PCT OF <2MM)	EXTR TOTAL S 6K3A (PCT OF <2MM)	DITH-CIT EXTRACTABLE FE 6C2B (PCT OF <2MM)	DITH-CIT EXTRACTABLE AL 6C7A (PCT OF <2MM)	DITH-CIT EXTRACTABLE MN 6D2A (PCT OF <2MM)	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1 (PCT <0.4MM)	ATTERBERG LIMITS - PI 4F	BULK DENSITY - FIELD MOIST 4A3A (G/CC)	BULK DENSITY - 1/3 BAR 4A1D (G/CC)	BULK DENSITY - OVEN DRY 4A1H (G/CC)	BULK DENSITY - WHOLE SOIL 4D1 (G/CC)	COLE 2-0.06 BAR 4A1A (CM/CM)	WATER CONTENT - 1/3 BAR 4B1C (PCT OF <2MM)	WATER CONTENT - 15 BAR 4B1C (PCT OF <2MM)	WRD WHOLE SOIL 4G2 (CM/CM)	WRD WHOLE SOIL 4G1 (CM/CM)
802331	1	1.68	0.120						0.67	0.50			1.39	1.46	0.016	11.3	19.6	16.0	7.1	0.12	
802332	2	0.99	0.081						0.79	0.47			1.40	1.54	0.030	15.1	22.4	18.4	10.6	0.10	
802333	3																				
802334	4	0.57							0.56	0.34			1.50			16.6			11.1		
802335	5	0.49							0.47	0.36			1.50			14.7			9.2		
802336	6	0.32							0.58	0.38			1.50			13.3			8.5		
802337	7	0.30							0.59	0.41			1.50			13.4			9.1		

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES - CA 5E4A (MEQ / 100 G)	MG 5B4A (MEQ / 100 G)	NA 5B4A (MEQ / 100 G)	K 5B4A (MEQ / 100 G)	SUM BASES (MEQ / 100 G)	ACIDITY 6H2B (MEQ / 100 G)	CEC SUM CATS 5A3A (MEQ / 100 G)	CEC NH4-OAC 5A6A (MEQ / 100 G)	EXCH NA 5D2 (PCT)	SAR 5E	BASE SATURATION SUM 5C3 (PCT)	BASE SATURATION NH4OAC 5C1 (PCT)	CO3 AS CACO3 <2MM 6E1B (PCT)	RES. OHMS /CM 6E1	CASO4 AS GYPSUM <2MM 6F1C (PCT)	CASO4 AS GYPSUM <20MM 6F1C (PCT)	SAT PASTE .01M 8C1B	CACL2 6C1E 1:2	H2O 8C1A 1:1
802331	1	9.4	3.2	--	0.8	13.4	1.8	15.2	12.4			88	100	--					6.6	7.1
802332	2	13.4	6.0	0.1	0.7	20.2	1.6	21.8	17.8			93	100	TR					7.0	7.5
802333	3																			
802334	4		9.7	0.2	0.4			16.3		1	TR		100	18	2200			7.7	7.7	8.1
802335	5		10.3	0.3	0.3			12.1		2	1		100	16	2500			8.2	8.1	8.6
802336	6		17.2	0.4	0.4			12.8		6	4		100	12	2100			8.4	8.2	9.0
802337	7		18.0	1.0	0.4			13.0		8	4		100	11	1900			8.4	8.2	8.9

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE - CA 6A1B (MEQ / LITER)	MG 6B1E (MEQ / LITER)	NA 6P1B (MEQ / LITER)	K 6W1B (MEQ / LITER)	CO3 6J1B (MEQ / LITER)	HCO3 6J1B (MEQ / LITER)	CL 6K1C (MEQ / LITER)	SO4 6L1C (MEQ / LITER)	NO3 6M1C (MEQ / LITER)	H2O 8A (PCT)	TOTAL ELEC. SALTS EST. 8A1A (MMHOS /CM)	MINERALOGY - CLAY - <2U - X-RAY 7A2B (RELATIVE AMOUNTS)	MINERALOGY - CLAY - <2U - X-RAY 7A2B (RELATIVE AMOUNTS)	MINERALOGY - CLAY - <2U - X-RAY 7A2B (RELATIVE AMOUNTS)	MINERALOGY - CLAY - <2U - X-RAY 7A2B (RELATIVE AMOUNTS)	MINERALOGY - CLAY - <2U - DTA 7A3 (PCT)	MINERALOGY - CLAY - <2U - DTA 7A3 (PCT)	TOT ANL 7C3 CLAY K2O 6Q3A (PCT)	TOT ANL 7C3 CLAY Fe 6C7A (PCT)
802331	1											0.16								
802332	2											0.19	MI 4	MI 3	KK 3	QZ 1	KK11		2.3	5.9
802333	3																			
802334	4	2.5	2.3	0.3	0.2	--	3.3	0.3	0.4	0.1	47.2	TR 0.48								
802335	5	1.0	2.5	1.5	0.2	--	3.9	0.3	0.8	0.2	41.7	TR 0.56	MI 3	MI 2	KK 2	CA 2	KK 8		1.8	4.5
802336	6	0.4	2.0	4.6	0.2	--	3.0	0.8	2.2	0.2	39.8	TR 0.76								
802337	7	0.0	3.4	5.7	0.3	--	4.0	1.1	2.5	0.2	42.1	TR 0.93	MI 5	MI 3	KK 3	LL 2	KK 8		2.3	5.5

ESTIMATED BULK DENSITY FOR LAYER 4, 5, 6, 7.

MMHOS/CM OF 1:2 WATER EXTRACT (8D1) FOR LAYERS 1, 2.

ANALYSES: S= ALL UN SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILLONITE MI MICA KK KAOLINITE QZ QUARTZ CA CALCITE
CL CHLORITE

RELATIVE AMOUNT 0 INSIGNIFICANT 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Williams.

Pedon Number: S80MT-083-2

Classification: Fine-loamy, mixed Typic Argiborolls.

Location: Richland County, Montana: 390 meters south and 240 meters west of the NE corner, Sec. 25, T.23N., R.8E. (Weather Station site).

Use and Vegetation: Native rangeland - Blue grama.

Parent Material: Glacial till.

Region: Northern Dark Brown Glaciated Plain - MLRA 53A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, moderately slowly permeable.

Water Table and Duration: None.

Slope: About 2 percent. Convex midslope - W aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-19-80

A1 - 0 to 13 cm.; very dark grayish brown (10YR3/2) loam, dark grayish brown (10YR4/2) dry; weak fine and medium granular structure; slightly hard, very friable; many fine and medium roots; 1 to 2 percent by volume small pebbles; neutral; clear smooth boundary. (802331).

B2t - 13 to 30 cm.; dark yellowish brown (10YR3/4) loam, dark yellowish brown (10YR4/4) dry; weak medium subangular blocky structure; hard, slightly firm; many fine roots; few fine pores; thin patchy clay films on faces of peds; 10 percent by volume of angular and rounded coarse fragments up to 3 cm. in diameter; mildly alkaline; clear wavy boundary. (802332).

B3ca - 30 to 38 cm.; brown (10YR5/3) clay loam, pale brown (10YR6/3) dry; weak fine and medium subangular blocky structure; hard, friable; common fine roots and pores; 5 to 10 percent by volume angular and rounded coarse fragments up to 4 cm. in diameter; fragments are partially coated with CaCO3; strong effervescence, moderately alkaline; clear smooth boundary.

C1ca - 38 to 64 cm.; brown (10YR5/3) clay loam, pale brown (10YR6/3) dry; massive; very hard, friable; few fine roots; common fine pores; 10 to 15 percent by volume coarse fragments partially coated with CaCO3; 10 to 20 percent by volume CaCO3; violent effervescence, strongly alkaline; gradual wavy boundary. (802334).

C2ca - 64 to 102 cm.; brown (10YR5/3) loam, pale brown (10YR6/3) dry; massive; very hard, friable; few fine roots; common fine pores; 5 to 10 percent by volume coarse fragments that are partially coated with CaCO3; 15 to 20 percent by volume CaCO3; violent effervescence, strongly alkaline; abrupt smooth boundary. (802335).

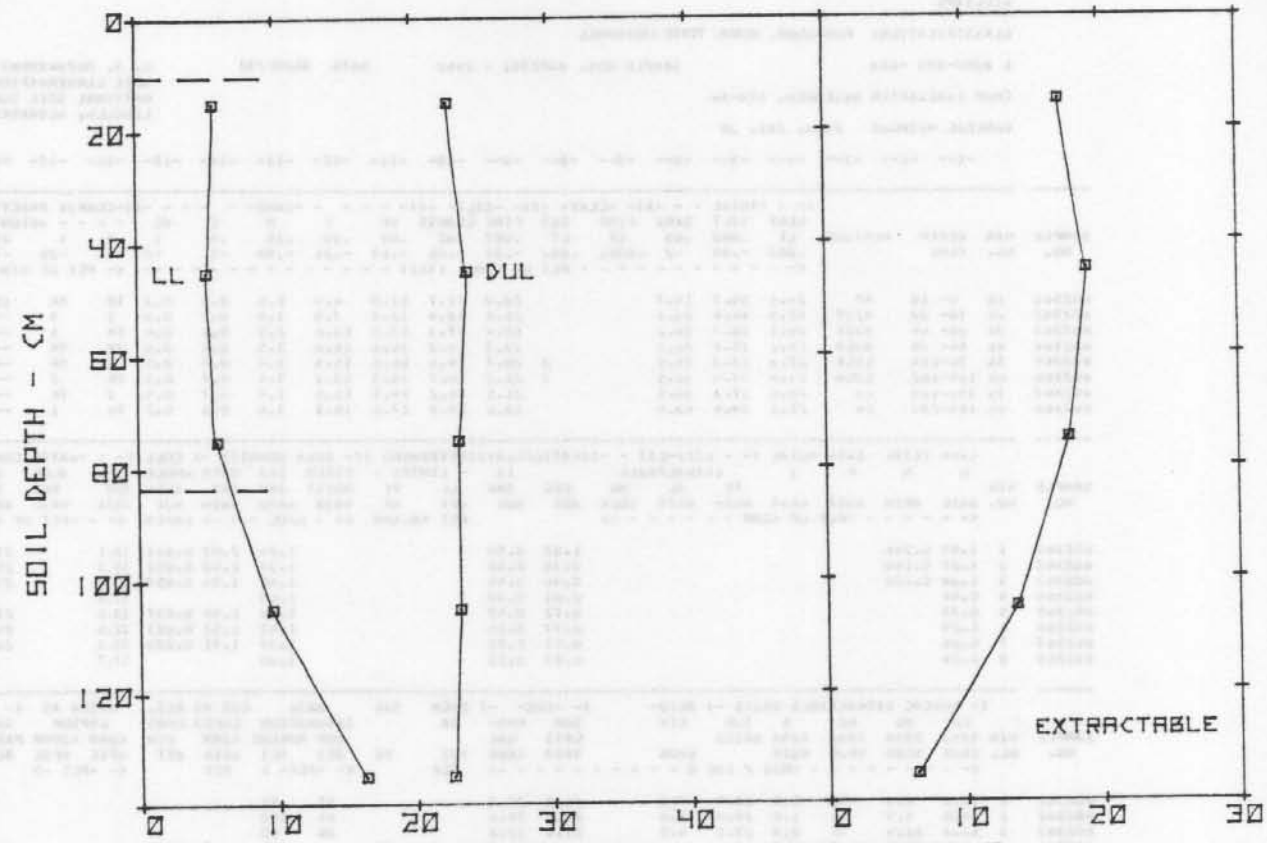
C3ca - 102 to 146 cm.; dark grayish brown (2.5Y4/2) loam, grayish brown (2.5Y5/2) dry; massive; very hard, firm; common fine and medium pores; about 10 percent by volume of coarse fragments; few soft masses of CaCO3; strong effervescence, strongly alkaline. (802336, 337).

Remarks: The lower boundary of the C2ca horizon consists of 1-2 cm. thick, platy and partially indurated CaCO3. Plates can be broken with the fingers. Percentage coarse fragments appear to increase with depth and loose samples could not be obtained below 140 cm. Clod samples below 30 cm. could not be collected because of dryness and coarse fragments.

Field Measured Soil Water Data Contributed By: F. H. Siddoway, USDA-AR, Northern Plains Soil and Water Research Center, Sidney, Montana.

Pedon Number: S80MT-083-2

FIELD MEASURED SOIL WATER LIMITS



WILLIAMS L-RICHLAND CO., MT.-RANGELAND-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	5.6	22.7	17.1
45	5.0	24.0	19.0
75	5.7	23.3	17.6
105	9.6	23.3	13.7
135	16.3	22.7	6.4

TOTAL WATER EXTRACTED FROM PROFILE = 22.1 Cm.

WILLIAMS

CLASSIFICATION: FINE-LOAMY, MIXED, TYPIC ARGIBOROLL

S 80ND-055 -C03 SAMPLE NOS. 80P2361 - 2368 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY CO3 LT .002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM)-WEIGHT 2-5	5-20	20-75	>2MM 75-381	>2MM WT OF WHOLE SOIL
				<- PCT OF <2MM (3A1) ->												<- PCT OF <75MM(3B1) ->				
802361	1S	0- 18	AP	24.6	55.7	19.7			28.0	27.7	11.0	6.4	1.6	0.5	0.2	TR	TR	10	18	10
802362	2S	18- 28	B21T	32.5	44.4	23.1			21.5	22.9	12.0	7.8	1.8	0.7	0.8	1	3	--	15	4
802363	3S	28- 64	B22T	35.1	36.7	28.2			19.4	17.3	13.9	10.0	2.5	0.6	0.6	TR	1	--	15	1
802364	4S	64- 76	B3CA	26.2	35.7	38.1			19.5	16.2	16.6	10.6	3.5	0.8	0.6	TR	TR	--	21	TR
802365	5S	76-114	C1CA	27.8	35.3	36.9		3	20.7	14.6	16.8	15.5	3.4	0.7	0.5	1	TR	--	21	1
802366	6S	114-152	C2CA	24.6	37.4	38.5		2	21.2	16.7	14.3	13.8	3.4	0.7	0.3	TR	2	--	20	2
802367	7S	152-183	C3	28.8	37.3	34.1			21.1	16.2	14.1	15.5	2.9	0.7	0.9	2	TR	--	22	2
802368	8S	183-203	C4	21.1	38.4	40.5			18.6	19.8	17.6	18.5	3.6	0.6	0.2	TR	1	--	24	1

SAMPLE NO.	HZN NO.	CARBON TOTAL C 6A1C <- PCT OF <2MM ->	NITROGEN TOTAL N 6B1B	EXTRACTABLE P 6S1A	EXTRACTABLE S 6K3A	EXTRACTABLE FE 6C2A	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8D1	15 BAR 8D1	LIQUID LIMIT 4F1 PCT <0.4MM	PLASTICITY INDEX 4P	FIELD MOIST 4A3A <- G/CC ->	1/3 BAR 4A1D <- G/CC ->	OVEN DRY 4A1H <- G/CC ->	CLOD WHOLE SOIL 4D1 CM/CM	2-0.06 BAR 4B1A <- PCT OF <2MM ->	0.06-1/3 BAR 4B1C <- PCT OF <2MM ->	1/3-15 BAR 4B1C <- PCT OF <2MM ->	15 BAR WHOLE SOIL 4B2 CM/CM	WRD WHOLE SOIL 4C1 CM/CM
802361	1	2.95	0.246						1.02	0.50			1.26	2.03	0.161	18.1		27.5	12.2	0.18	
802362	2	1.27	0.140						0.76	0.41			1.37	1.60	0.052	19.3		25.3	13.4	0.16	
802363	3	0.68	0.100						0.96	0.44			1.49	1.76	0.057	20.7		23.0	15.3	0.11	
802364	4	0.44							0.81	0.48			1.40			17.6			12.6		
802365	5	0.33							0.72	0.45			1.38	1.54	0.037	18.2		21.0	12.4	0.12	
802366	6	0.29							0.77	0.49			1.42	1.52	0.023	21.6		24.1	14.4	0.14	
802367	7	0.26							0.93	0.52			1.39	1.51	0.028	22.3		26.5	14.9	0.16	
802368	8	0.24							0.83	0.55			1.40			17.7			11.7		

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E4A <- MEQ / 100 G ->	MG 5B4A	NA 5B4A	K 5B4A	SUM BASES 5B4A	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-UAC 5A6A	EXCH NA 5D2 PCT	SAR 5E	BASE SATURATION SUM NH4OAC 5C3 <- PCT->	CO3 AS CACO3 <2MM 6E1B PCT	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C <- PCT ->	CASO4 AS GYPSUM <20MM 6F1C	SAT PASTE 8C1B	PH CACL2 .01M 8C1E 1:2	PH H2O 8C1A 1:1
802361	1	16.1	6.3	TR	1.5	23.9	7.2	31.1	25.2			77	95					5.6	6.1
802362	2	14.0	9.9	TR	1.0	24.9	4.6	29.5	24.6			84	100					6.0	6.5
802363	3	13.3	12.5	TR	0.9	27.1	4.5	31.6	33.8			86	80					6.1	6.7
802364	4		16.4	0.2	0.7				21.1	1	TR		100	5	2200		7.6	7.6	7.9
802365	5		16.3	0.2	0.7				20.1				100	9				7.9	8.3
802366	6		24.1	1.0	0.7				22.8	4	3		100	7	1900	--	8.2	8.2	8.6
802367	7		26.0	2.0	0.9				26.5	7	5		100	6	1600		8.4	8.3	8.7
802368	8		19.4	1.9	0.8				17.6	9	5		100	6	1400		8.3	8.2	8.6

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B <- MEQ / LITER ->	MG 6D1D	NA 6P1B	K 6Q1B	CO3 6I1D	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8D5	ELEC. COND. 8A1A MMHOS /CM	MINERALOGY CLAY <2U X-RAY 7A2B	MINERALOGY CLAY <2U X-RAY 7A2B	MINERALOGY CLAY <2U X-RAY 7A2B	MINERALOGY CLAY <2U X-RAY 7A2B	MINERALOGY DIA <2U 7A3	MINERALOGY DIA <2U 7A3	TOT ANL CLAY K2O 603A <- PCT ->	TOT ANL CLAY Fe 6C7A <- PCT ->
														<- RELATIVE AMOUNTS ->							
802361	1												0.19								
802362	2												0.09	MT 4	MI 3	KK 3	CL 1	KK 9		1.8	5.3
802363	3												0.10								
802364	4	1.3	1.9	0.9	0.2	--	2.7	0.1	0.3	0.2	93.5	TR	0.34								
802365	5												0.24	MT 4	MI 3	KK 3	QZ 1	KK 9		2.2	6.0
802366	6	6.5	2.0	3.0	0.2	--	3.6	0.1	0.0	0.5	89.1	TR	0.53								
802367	7	0.3	1.0	4.9	0.1	--	4.0	0.1	1.2	0.7	84.1	TR	0.66	MT 5	MI 3	KK 3	QZ 2	KK12		2.0	6.3
802368	8	0.7	3.1	7.2	0.2	--	3.9	0.2	5.9	1.0	81.9	TR	1.10								

FAMILY CONTROL SECTION: DEPTH 18- 86 PCT CLAY 34 PCT .1-75MM 16

ESTIMATED BULK DENSITY FOR LAYER 4, 8,

MMHOS/CM OF 1:2 WATER EXTRACT (8A1) FOR LAYERS 1, 2, 3, 5,

ANALYSES: S= ALL OR SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE CL CHLORITE QZ QUARTZ

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Williams.

Pedon Number: S80ND-059-3

Classification: Fine-loamy, mixed Typic Argiborolls.

Location: Morton County, North Dakota: 644 meters south and 68 meters west of the NE corner, Sec. 18, T.138N., R.81W.

Use and Vegetation: Cropland - presently fallow - previously cropped to wheat.

Parent Material: Glacial till.

Region: Central Dark Brown Glaciated Plain - MLRA 53B.

Position: Upland.

Elevation: About 585 meters.

Drainage and Permeability: Well drained, moderately slowly permeable.

Water Table and Duration: None.

Slope: About 1 percent.

Sampled and Described By: Larry F. Ratliff and James F. Strum Date: 8-27-80

Ap -- 0 to 18 cm.; black (10YR2/2) silt loam, very dark grayish brown (10YR3/2) dry; weak fine and medium granular structure; hard, friable; common fine and medium roots; few coarse fragments up to 7.5 cm. in diameter; slightly acid; clear smooth boundary. (802361).

B21t -- 18 to 28 cm.; very dark grayish brown (10YR3/2) heavy clay loam, dark grayish brown (10YR4/2) dry; moderate medium prismatic parting to weak fine and medium subangular blocky structure; very hard, firm; common fine and medium roots; few fine pores; thick continuous clay films on faces of peds; few coarse fragments up to 7.5 cm. in diameter; slightly acid; clear smooth boundary. (802362).

B22t -- 28 to 64 cm.; dark brown (10YR3/3) clay loam, brown (10YR4/3) dry; horizon has a yellowish brown cast; moderate medium prismatic parting to moderate fine and medium subangular blocky structure; very hard, firm; few fine roots; common fine and medium pores; thick almost continuous clay films on faces of peds; ocassional coarse fragments less than 3 cm. diameter; neutral; gradual wavy boundary. (802363).

B3ca -- 64 to 76 cm.; dark grayish brown (2.5Y4/2) heavy loam; grayish brown (2.5Y5/2) weak medium prismatic parting to weak medium subangular blocky structure; very hard, slightly firm; few fine roots and pores; thin and patchy clay films on faces of peds; few coarse fragments; few threads and soft masses of white CaCO3; slight effervescence, moderately alkaline; clear wavy boundary. (802364).

C1ca -- 76 to 114 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.5Y5/2) dry; matrix color partially obscured by white CaCO3; massive; very hard, firm; few fine roots and pores; few coarse fragments; 20 percent by volume of threads and soft masses white CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (802365).

C2ca -- 114 to 152 cm.; dark grayish brown (2.5 Y4/2) light clay loam, grayish brown (2.5Y5/2) dry; few fine distinct gray (N5) mottles; massive; very hard, firm; few fine pores; few fine coarse fragments; 5 to 10 percent by volume of threads and soft masses white CaCO3; strong effervescence, strongly alkaline; gradual wavy boundary. (802366).

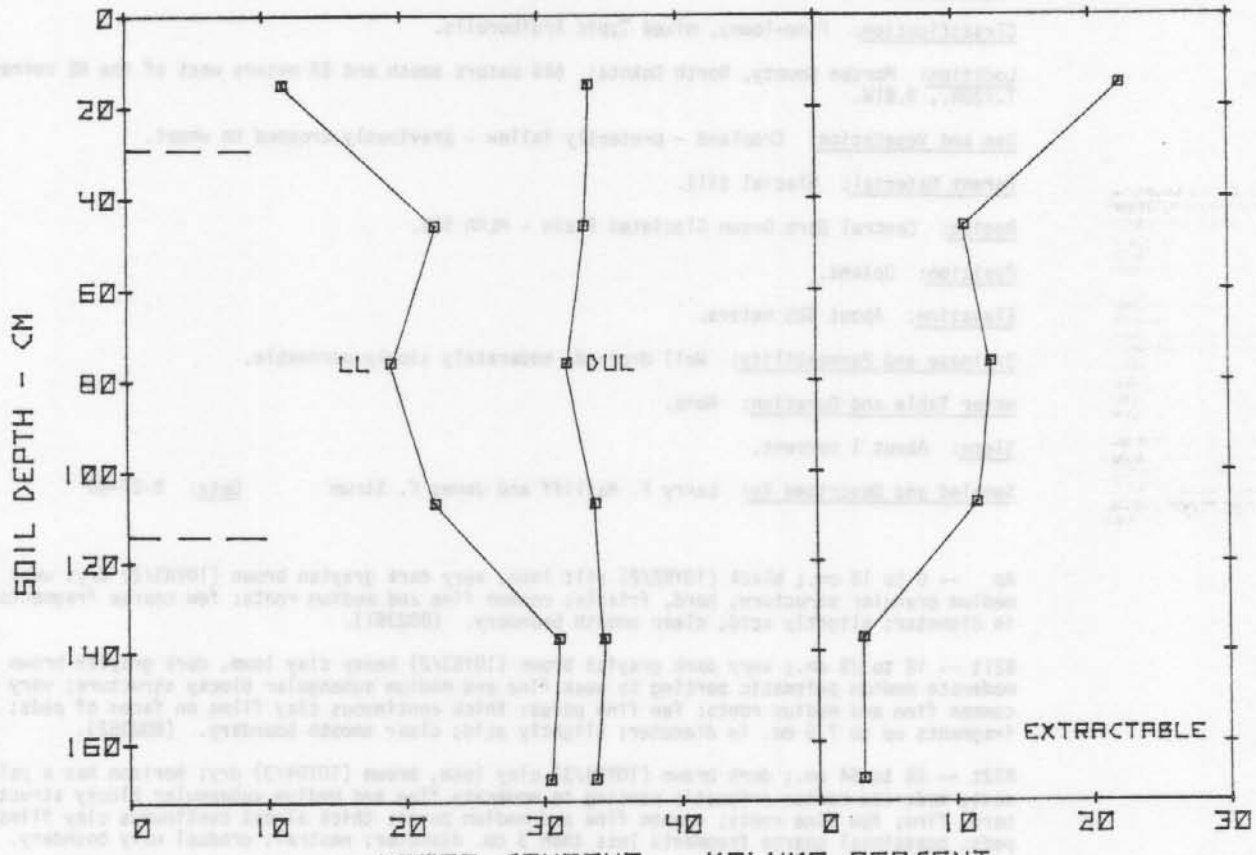
C3 -- 152 to 183 cm.; olive brown (2.5Y4/4) light clay loam, light olive brown (2.5Y5/4) dry; common medium and coarse gray (N5) mottles; massive; hard, friable; few threads and soft masses of CaCO3 and gypsum; weak effervescence, strongly alkaline; gradual wavy boundary. (802367).

C4 -- 183 to 203 cm.; olive (5Y4/3) loam, olive (5Y5/3) dry; few fine faint gray mottles; massive; slightly hard, friable; few coarse fragments; few threads and soft masses of CaCO3 and gypsum; weak effervescence, strongly alkaline. (802368).

Field Measured Soil Water Data Contributed By: Armand Bauer, USDA-AR, Northern Great Plains Research Center, Mandan, ND.

Pedon Number: S80ND-059-3

FIELD MEASURED SOIL WATER LIMITS



WILLIAMS SIL-MORTON CO.,N.D.-SP.WHEAT-1978.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	11.4	33.6	22.2
46	22.4	33.2	10.8
76	19.2	31.9	12.7
107	22.3	33.9	11.6
137	31.2	34.5	3.3
168	30.5	33.8	3.3

TOTAL WATER EXTRACTED FROM PROFILE = 19.5 Cm.

WILLIAMS V

CLASSIFICATION: FINE-LOAMY, MIXED, TYPIC HAPLUDORELL

S 80M1-065 -001 SAMPLE NOS. 80P2338 - 2345 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH, SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

-1-- -2-- -3-- -4-- -5-- -6-- -7-- -8-- -9-- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .05	TOTAL SAND FINE .0002	CLAY CO3 .002	SILT FINE .02	SILT COARSE .05	SAND VF .10	SAND F .25	SAND M .50	SAND C -1	SAND VC -2	COARSE FRACTIONS(MM) WEIGHT 5	20	.1-75	>2MM PCT OF 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->											<- PCT OF <75MM(3B1)->				
802338	1S	0- 10	AP	13.7	28.8	57.5		12.0	14.8	18.4	29.2	9.2	2.0	0.7	1	1	--	42	2
802339	2S	10- 25	A12	16.1	25.0	58.9		11.6	13.4	16.5	30.4	9.1	2.1	0.8	1	1	--	44	2
802340	3S	25- 43	B2	14.4	23.8	61.8		10.7	13.1	18.2	32.9	8.8	1.5	0.4	TR	TR	--	44	TR
802341	4S	43- 74	C1CA	18.1	25.4	56.0	1	15.6	10.3	17.4	25.6	6.6	3.2	1.0	1	1	--	40	2
802342	5S	74- 91	C2	31.7	36.6	31.7	11	22.6	14.0	10.2	10.2	5.8	2.7	2.8	2	2	--	25	4
802343	6S	91-117	C2	28.8	36.6	34.6	8	22.6	14.0	10.4	11.7	6.6	3.7	2.2	2	2	5	31	9
802344	7S	117-152	C3	25.1	37.7	37.2	5	21.4	16.3	11.4	13.4	6.6	3.1	2.7	3	6	--	32	9
802345	8S	152-183	C3	14.6	39.5	46.9	2	21.7	17.8	12.7	14.1	7.6	4.2	2.3	3	3	13	42	19

SAMPLE NO.	HZN NO.	ORGN TOTAL C	TOTAL N	EXTR TOTAL P	EXTRACTABLE FE	EXTRACTABLE AL	EXTRACTABLE MN	CITH-CIT CEC	CITH-CIT BAR	RATIO/CLAY LS	ATTERBERG LIMITS - LL	ATTERBERG LIMITS - PI	BULK DENSITY - FIELD MOIST	BULK DENSITY 1/3 BAR	BULK DENSITY OVEN DRY	COLE WHOLE SOIL	WATER CONTENT - 2- BAR	WATER CONTENT - 0.06 BAR	WATER CONTENT - 1/3 BAR	WATER CONTENT - 15 BAR	WRD WHOLE SOIL
		<- - - - - - -PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
802338	1	1.16	0.101					0.85	0.47					1.40			9.7			6.4	
802339	2	0.89	0.084					0.82	0.45					1.52	1.58	0.015	10.2	20.9	15.3	7.2	0.12
802340	3	0.55	0.061					0.90	0.49					1.50			9.4			7.0	
802341	4	0.54						0.65	0.46					1.44	1.53	0.020	10.7		15.2	8.3	0.10
802342	5	0.42						0.43	0.39					1.46	1.55	0.020	19.2		22.4	12.3	0.14
802343	6	0.36						0.47	0.41					1.50			18.5			11.8	
802344	7	0.29						0.53	0.45					1.51	1.64	0.026	16.4		19.6	11.3	0.12
802345	8	0.22						0.61	0.46					1.50			13.7			9.0	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B4A	NH4OAC EXTRACTABLE BASES MG 5B4A	NH4OAC EXTRACTABLE BASES NA 5B4A	NH4OAC EXTRACTABLE BASES K 5B4A	NH4OAC EXTRACTABLE BASES SUM BASES	ACID-ITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-OAC 5A8A	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM 5C3	BASE SATURATION NH4OAC 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	GASG4 AS GYPSUM <2MM 6F1C	GASG4 AS GYPSUM <20MM 6F1C	PH SAT PASTE 8C1B	PH CACL2 .01M 8C1E	PH H2O 8C1A
		<- - - - - - - - - -MEQ / 100 G - - - - - - - - - ->								PCT		<- -PCT- ->		PCT		<- -PCT ->			1:2	1:1
802338	1	7.6	2.8	TR	0.9	11.3	3.4	14.7	11.6			77	97						5.4	6.1
802339	2	9.1	3.4	0.1	0.5	13.1	1.9	15.0	13.2			87	99						6.1	6.6
802340	3	9.5	4.1	0.1	0.3	14.0	0.4	14.4	12.9			97	100	--					6.6	7.1
802341	4		7.1	0.1	0.3				11.7				100	12					7.6	8.1
802342	5		21.4	0.6	0.4				15.7	3	2		100	23	2200			8.3	8.1	8.6
802343	6		23.8	0.7	0.4				13.4	4	2		100	22	2100			8.4	8.1	8.7
802344	7		20.5	0.8	0.4				13.2	5	3		100	17	2200			8.3	8.1	8.8
802345	8		15.7	1.0	0.4				12.0	7	4		100	14	2400			8.3	8.2	8.8

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6B1B	NA 6P1B	K 6Q1B	CO3 6I1B	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8A5	ELEC. COND. 8A1A /CM	CLAY X-RAY <2U 7A2B	CLAY X-RAY <2U 7A2B	CLAY X-RAY <2U 7A2B	CLAY X-RAY <2U 7A2B	DTA <2U 7A3	DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- - - - - - - - - - -MEQ / LITER - - - - - - - - - ->									<- -PCT ->		MMHOS	<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
802336	1												0.15								
802337	2												0.11								
802340	3												0.15	MT 4	MI 3	KK 3	CL 1	KK 9		2.1	5.9
802341	4												0.22								
802342	5	0.8	3.5	2.5	0.2	--	4.0	0.1	1.2	0.5	51.7	TR	0.64								
802343	6	0.5	3.2	3.3	0.2	--	3.9	0.1	1.4	0.6	49.0	TR	0.68								
802344	7	0.4	2.6	3.6	0.2	--	3.8	0.2	1.4	0.5	47.5	TR	0.69	MT 4	MI 3	KK 3	GZ 2	KK11		1.9	4.7
802345	8	0.4	2.4	4.0	0.2	--	4.3	0.2	1.7	0.9	40.0	TR	0.72								

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 18 PCT .1-75MM 36

ESTIMATED BULK DENSITY FOR LAYER 1, 3, 6, 8,

MMHOS/CM OF 1:2 WATER EXTRACT (3A1) FOR LAYERS 1, 2, 3, 4,

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MT MONTMORILL MI MICA KK KAOLINITE CL CHLORITE GZ QUARTZ

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Williams Variant[1/].

Pedon Number: S80MT-085-1

Classification: Fine-loamy, mixed Typic Haploborolls.

Location: Roosevelt County, Montana: 630 meters south and 33 meters east of the NW corner of Sec. 19, T.9N., R.56E. (Barrier 2 site).

Use and Vegetation: Cropland - presently fallow - previously cropped to winter wheat.

Parent Material: Glacial till.

Region: Northern Dark Brown Glaciated Plain - MLRA 53A.

Position: Upland.

Elevation: ----------

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: About 1 to 2 percent, Convex ridgetop, south aspect.

Sampled and Described By: Larry F. Ratliff Date: 8-20-80

Ap - 0 to 10 cm.; very dark grayish brown (10YR3/2) fine sandy loam, dark grayish brown (10YR4/2) dry; weak fine granular structure; slightly hard, very friable; few fine roots; 2 percent by volume coarse fragments; non-calcareous, slightly acid; clear smooth boundary. (802338).

A12 - 10 to 25 cm.; very dark grayish brown (10YR3/2) fine sandy loam, dark grayish brown (10YR4/2) dry; weak fine and medium subangular blocky structure; slightly hard, very friable; few fine roots and pores; 2 percent by volume coarse fragments; non-calcareous, neutral; gradual smooth boundary. (802339).

B2 - 25 to 43 cm.; dark brown (10YR3/3) fine sandy loam, brown (10YR4/3) dry; weak medium subangular blocky structure; slightly hard, very friable; few fine roots and pores; 2 percent by volume coarse fragments; non-calcareous, neutral; clear wavy boundary. (802340).

C1ca - 43 to 74 cm.; dark grayish brown (2.5Y4/2) and grayish brown (2.5Y5/2) fine sandy loam, grayish brown (2.5Y5/2) and light brownish gray (2.5Y6/2) dry; massive; hard, friable; few fine roots; common fine and medium pores; 5 to 10 percent by volume coarse fragments; 15 percent by volume white soft masses $CaCO_3$; violent effervescence, moderately alkaline; clear wavy boundary. (802341).

C2 - 74 to 117 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.5Y5/2) dry; massive*; hard, firm; few fine roots and pores; 5 percent by volume coarse fragments which are partially coated with $CaCO_3$; strong effervescence, strongly alkaline. (802342, 343).

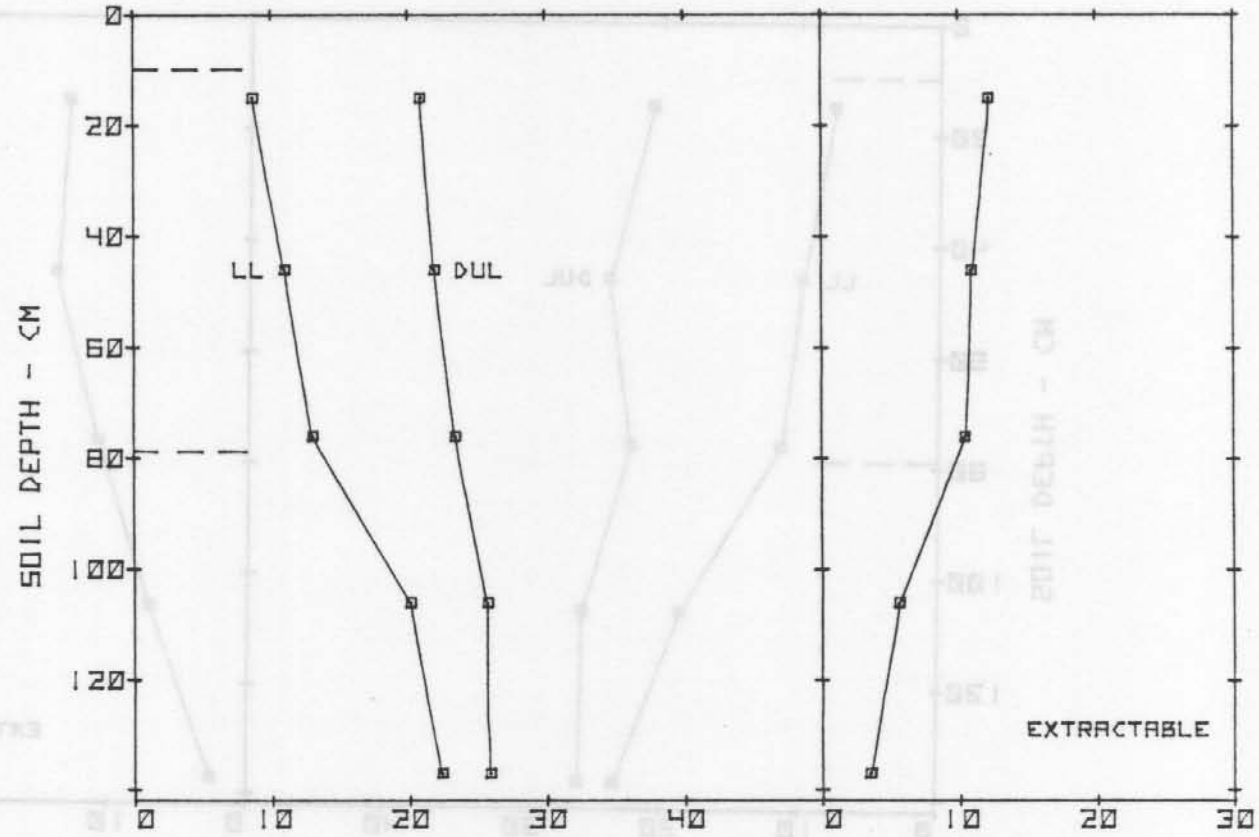
C3 - 117 to 183 cm.; dark grayish brown (2.5Y4/2) loam, grayish brown (2.5Y5/2) dry; massive*; hard, firm; few fine pores, 5 percent by volume coarse fragments which are partially coated with $CaCO_3$; strong effervescence, strongly alkaline. (802344, 345).

Remarks: [1/]Pedon does not have an argillic horizon and is borderline to coarse-loamy textural family. *The C horizon shows some evidence of structure. There are definitely vertical cleavage planes which have slightly darker color than the matrix. The lower part of the C2 horizon appears to have a slight clay decrease. Within the study area, 10 barrier plots have been monitored for water content. Each plot was examined and the soil is uniform. Major difference was depth to Cca which ranged from 33 to 58 cm. Also, some pedons had weakly expressed argillic horizons.

Field Measured Soil Water Data Contributed By: F. H. Siddoway, USDA-AR, Northern Plains Soil and Water Research Center, Sidney, Montana.

Pedon Number: S80MT-085-1

FIELD MEASURED SOIL WATER LIMITS



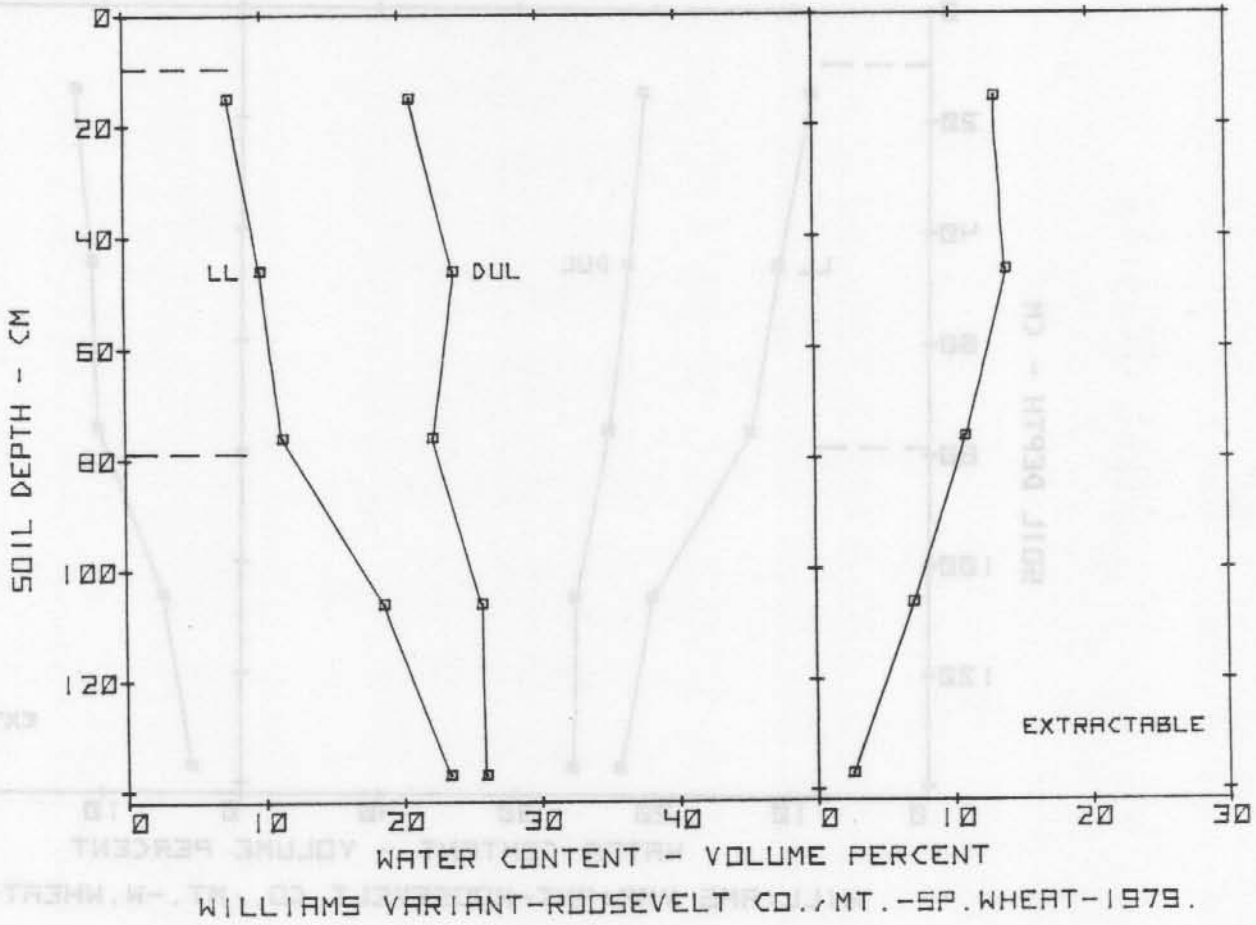
WILLIAMS VARIANT-ROOSEVELT CO., MT.-W. WHEAT-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	8.7	20.9	12.2
46	11.0	21.9	10.9
76	13.0	23.4	10.4
106	20.1	25.7	5.6
137	22.4	25.9	3.5

TOTAL WATER EXTRACTED FROM PROFILE = 13.0 Cm.

Pedon Number: S80MT-085-1

FIELD MEASURED SOIL WATER LIMITS

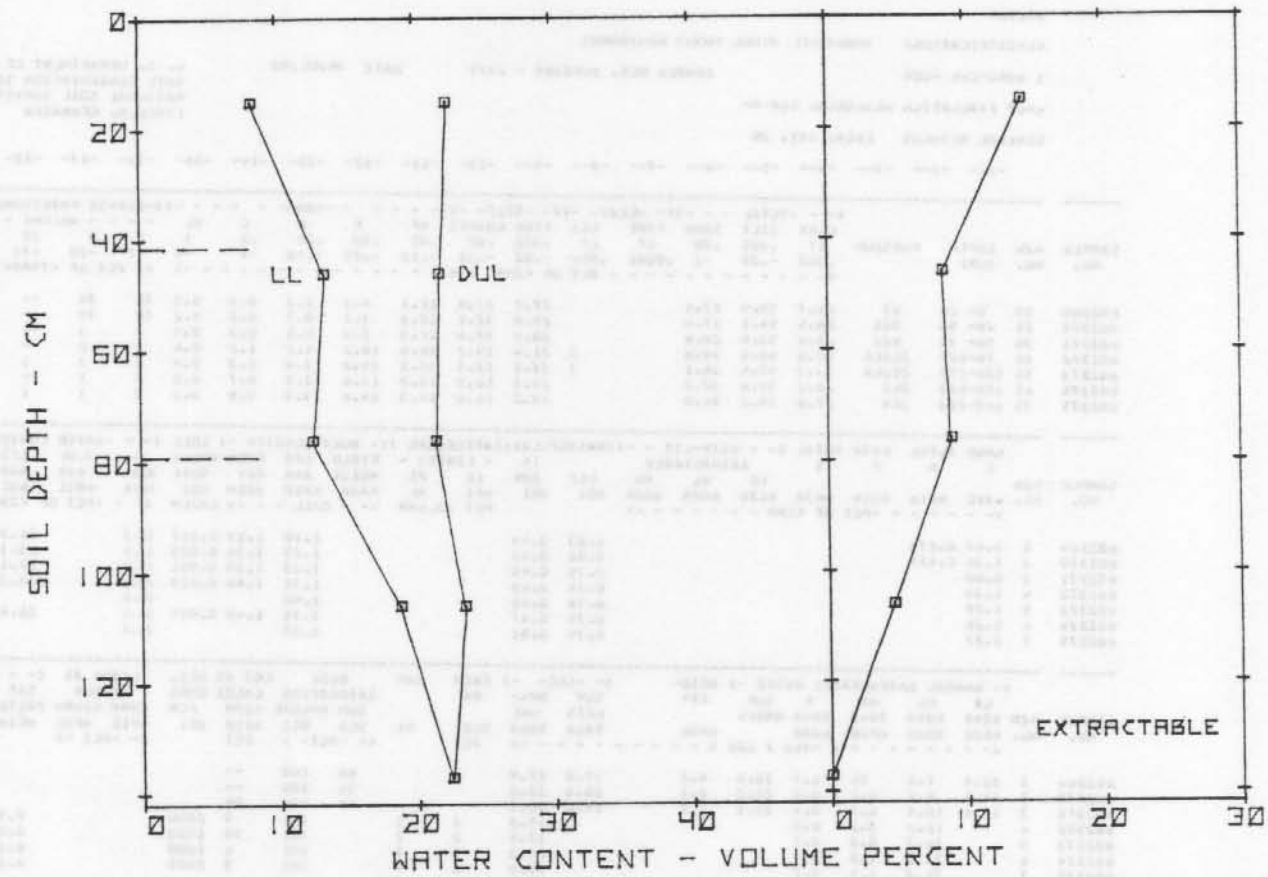


SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	7.6	20.8	13.2
46	9.9	23.9	14.0
76	11.4	22.3	10.9
106	18.7	25.8	7.1
137	23.4	26.0	2.6

TOTAL WATER EXTRACTED FROM PROFILE = 14.5 Cm.

Pedon Number: S80MT-085-1

FIELD MEASURED SOIL WATER LIMITS



WILLIAMS VARIANT-ROOSEVELT CO./MT.-BARLEY-1979.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	8.2	22.4	14.2
46	13.4	21.8	8.4
76	12.5	21.5	9.0
106	18.8	23.5	4.7
137	22.5	22.5	0.0

TOTAL WATER EXTRACTED FROM PROFILE = 11.0 Cm.

WILTON

CLASSIFICATION: FINE-SILTY, MIXED, PACHIC HAPLOBOROLL

S 80ND-G54 -G04 SAMPLE NOS. 80P2369 - 2375 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH: SEA-AR

GENERAL METHODS 1B1A, 2A1, 2B

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT .002	TOTAL SILT .002-.05	TOTAL SAND .05-2	CLAY FINE LT .0002	CLAY COARSE .0002-.002	SILT FINE .002-.02	SILT COARSE .02-.05	SAND VF .05-.10	SAND F .10-.25	SAND M .25-.50	SAND C .5-1	SAND VC 1-2	COARSE FRACTIONS(MM) WEIGHT 2-5	5-20	20-75	.1-75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
802369	1S	0- 28	A1	22.7	59.9	17.4			27.1	32.8	11.1	4.2	1.2	0.4	0.5	TR	TR	--	6	TR
802370	2S	28- 56	B21	20.9	56.1	17.0			24.0	32.1	12.8	3.1	0.7	0.2	0.2	TR	TR	--	4	TR
802371	3S	56- 76	B22	23.8	53.6	20.6			20.0	33.6	17.3	2.0	0.5	0.3	0.5	1	3	--	7	4
802372	4S	76-122	2C1CCA	20.6	40.6	38.8		2	21.4	19.2	16.6	16.2	4.2	1.2	0.6	2	2	--	25	4
802373	5S	122-155	2C2CCA	23.5	40.4	36.1		3	23.1	17.3	16.1	14.8	3.8	1.0	0.4	1	2	1	23	4
802374	6S	155-183	2C3	28.2	39.6	32.2			23.3	16.3	14.2	13.6	3.2	0.7	0.5	1	1	--	20	2
802375	7S	183-213	2C4	27.8	39.2	33.0			23.2	16.0	14.3	14.6	3.3	0.6	0.2	2	1	1	22	4

SAMPLE NO.	HZN NO.	ORGN TOTAL C	TOTAL N	EXTR TOTAL P	EXTR TOTAL S	DITH-CIT EXTRACTABLE FE	DITH-CIT EXTRACTABLE AL	DITH-CIT EXTRACTABLE MN	RATIO/CLAY CEC 8D1	RATIO/CLAY 15 BAR 8D1	ATTERBERG LIMITS - LL 4F1	ATTERBERG LIMITS - PI 4F	BULK DENSITY - FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- 0.06 BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2	WRD WHOLE SOIL 4G1
		<- - - - - - -PCT OF <2MM - - - - - - ->								PCT <0.4MM			<- - G/CL - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
802369	1	3.47	0.275						1.23	0.49				1.10	1.19	0.027	20.3		26.5	11.1	0.17
802370	2	1.16	0.115						0.88	0.43				1.23	1.34	0.029	17.4		23.1	11.6	0.14
802371	3	0.80							0.79	0.40				1.23	1.35	0.031	15.3		22.1	10.4	0.14
802372	4	0.39							0.74	0.43				1.38	1.48	0.023	14.1		20.2	8.8	0.15
802373	5	0.29							0.76	0.46				1.40			17.8			10.8	
802374	6	0.26							0.74	0.47				1.31	1.45	0.034	21.1		26.6	13.3	0.17
802375	7	0.27							0.74	0.51				1.30			21.5			14.2	

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5E4A	MG 5B4A	NA 5B4A	K 5B4A	SUM BASES 5B4A	ACIDITY 6H2B	CEC SUM CATS 5A3A	CEC NH4-UAC 5A6A	EXCH NA 5D2	SAR 5E	BASE SATURATION SUM NH4OAC 5C3	BASE SATURATION CA 5C1	CO3 AS CACO3 <2MM 6E1B	RES. OHMS /CM 8E1	CASO4 AS GYPSUM <2MM 6F1C	CASO4 AS GYPSUM <20MM 6F1C	PH SAT PASTE 8C1B	PH CACL2 .01M 8C1E	PH H2O 8C1A
		<- - - - - - - - -MEQ / 100 G - - - - - - - - ->								PCT		<- -PCT- >		PCT		<- -PCT ->			1:2	1:1
802369	1	22.4	7.1	TR	1.3	30.8	4.2	35.0	27.9			88	100	--					6.8	7.4
802370	2	16.3	9.2	0.1	0.6	26.2	2.6	28.8	23.8			91	100	--					7.2	7.8
802371	3	14.4	10.1	0.2	0.4	25.1	1.9	27.0	20.3			93	100	TR					7.4	8.0
802372	4		12.3	0.3	0.4				15.3	2	1		100	9	2200			7.9	7.8	8.3
802373	5		16.7	0.8	0.5				17.9	3	2		100	10	1700			8.0	8.1	8.5
802374	6		21.5	1.3	0.7				22.3	5	3		100	6	1400			8.1	8.1	8.6
802375	7		21.8	1.5	0.7				21.9	6	4		100	3	1800			8.1	8.1	8.6

SAMPLE NO.	HZN NO.	WATER EXTRACTED FROM SATURATED PASTE CA 6A1B	MG 6D1B	NA 6P1B	K 6W1B	CO3 6J1D	HCO3 6J1B	CL 6K1C	SO4 6L1C	NO3 6M1C	H2O 8A	TOTAL SALTS EST. 8A1A	ELEC. COND. MMHOS /CM	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A2B	MINERALOGY CLAY X-RAY <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K20 603A	TOT ANL 7C3 CLAY Fe 6C7A
		<- - - - - - - - - -MEQ / LITER - - - - - - - - ->									<- -PCT ->	/CM	<- RELATIVE AMOUNTS ->					<- - - - -PCT - - - ->			
802369	1											0.21									
802370	2											0.18	MI 4	MI 3	KK 2	VR 1	KK11			2.0	6.3
802371	3											0.21									
802372	4	1.4	2.2	1.5	0.1	--	3.3	0.2	1.0	--	41.4	TR	0.47	MI 5	MI 3	KK 3	CL 1	KK12		1.7	6.0
802373	5	1.2	3.3	3.4	0.1	--	3.8	0.9	2.3	--	49.6	TR	0.76								
802374	6	0.5	1.4	3.4	0.1	--	3.0	0.5	1.0	0.2	54.2	TR	0.53								
802375	7	0.5	1.1	3.8	0.1	--	3.1	0.2	1.4	0.2	54.6	TR	0.54	MI 4	MI 3	VC 2	KK 2	KK 8		2.1	5.8

FAMILY CONTROL SECTION: DEPTH 25-100 PCT CLAY 24 PCT .1-75MM 12

ESTIMATED BULK DENSITY FOR LAYER 5, 7.

MMHOS/CM OF 1:2 WATER EXTRACT (6B1) FOR LAYERS 1, 2, 3.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL MI MONTMORILL MI MICA KK KAOLINITE VR VERMICULITE CL CHLORITE
VC VERM-CHLOR

RELATIVE AMOUNT 5 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Wilton.

Pedon Number: S80ND-059-4

Classification: Fine-silty, mixed Pachic Haplaborolls.

Location: Morton County, North Dakota: SW 1/4 Sec. 16, T.138, R.81. Site is 2 meters west of Tube 74 - Pasture 63 of R. J. Lorenz's Range Study south of Mandan.

Use and Vegetation: Native rangeland - Western wheatgrass and blue grama.

Parent Material: Loess mantle over glacial till.

Region: Central Dark Brown Glaciated Plain - MLRA 53B.

Position: Upland.

Elevation: About 590 meters.

Drainage and Permeability: Well drained, moderately permeable.

Water Table and Duration: None.

Slope: About 2 percent.

Sampled and Described By: Larry F. Ratliff and James F. Strum Date: 8-28-80

A1 -- 0 to 28 cm.; black (10YR2.5/1) silt loam, very dark gray (10YR3/1) dry; moderate fine and medium granular structure; slightly hard, very friable; many fine roots; mildly alkaline; clear smooth boundary. (802369).

B21 -- 28 to 56 cm.; very dark grayish brown (10YR3/2) heavy silt loam, dark grayish brown (10YR4/2) dry; weak fine and medium subangular blocky structure; hard, friable; many fine roots; few very fine pores; mildly alkaline; gradual wavy boundary. (802370).

B22 -- 56 to 76 cm.; dark brown (10YR3/3) silt loam, brown (10YR4/3) dry; weak fine and medium subangular blocky structure; slightly hard, friable; common fine and medium roots; common fine pores; few fine concretions of CaCO3 in lower part; moderately alkaline; clear wavy boundary. (802371).

IIC1ca -- 76 to 122 cm.; dark grayish brown (2.5Y4/2) loam, grayish brown (2.5Y5/2) dry; massive; hard, firm; few fine roots and pores; 5 percent by volume of rounded and angular coarse fragments up to 5 cm. in diameter; 10 percent by volume of threads and masses white CaCO3; violent effervescence, moderately alkaline; gradual wavy boundary. (802372).

IIC2ca -- 122 to 155 cm.; dark grayish brown (2.5Y4/2) and grayish brown (2.5Y5/2) loam, grayish brown (2.5Y5/2) and light brownish gray (2.5Y6/2) dry; massive; few fine distinct yellowish brown mottles; hard, firm; few fine roots and pores; 5 percent by volume of rounded and angular coarse fragments up to 5 cm. in diameter; 10 to 15 percent by volume of threads and soft masses white CaCO3; soil material is somewhat compact and breaks into plates about 1 to 2 cm. thick - plates are being penetrated by roots; violent effervescence, strongly alkaline; gradual wavy boundary. (802373).

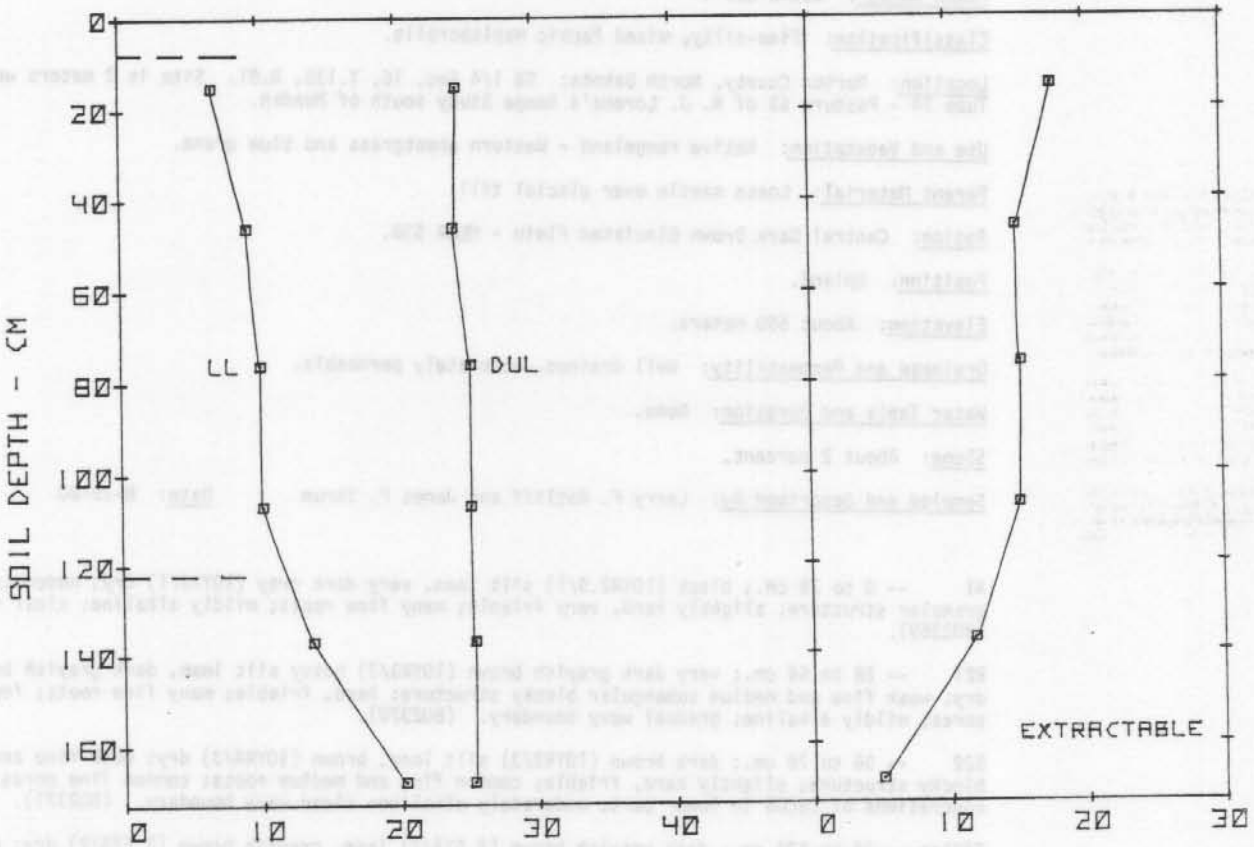
IIC3 -- 155 to 183 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.6Y5/2) dry; massive; hard, firm; few fine roots and pores; 2 to 3 percent by volume coarse fragments generally less than 2 cm. in diameter; about 5 percent by volume soft masses of white CaCO3; strong effervescence, strongly alkaline; gradual wavy boundary. (802374).

IIC4 -- 183 to 213 cm.; dark grayish brown (2.5Y4/2) clay loam, grayish brown (2.5Y5/2) dry; few fine distinct yellowish brown mottles; massive; hard, friable; few fine pores; few soft masses of white CaCO3; ocassional small coarse fragments; weak effervescence, strongly alkaline. (802375).

Field Measured Soil Water Data Contributed By: R. J. Lorenz, USDA-AR, Northern Great Plains Research Center, Mandan, ND.

Pedon Number: S80ND-059-4

FIELD MEASURED SOIL WATER LIMITS



WILTON SIL-MORTON CO./N.D.-RANGELAND-1976.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
15	6.8	24.5	17.7
46	9.2	24.2	15.0
76	10.1	25.4	15.3
107	10.2	25.3	15.1
137	13.7	25.5	11.8
168	20.3	25.3	5.0

TOTAL WATER EXTRACTED FROM PROFILE = 24.4 Cm.

ZANESVILLE T

CLASSIFICATION: FINE-SILTY, MIXED, MESIC TYPIC FRAGIUDULT

S 80KY-033 -002 SAMPLE NOS. 81P 755 - 760 DATE 06/28/82

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

CROP EVALUATION RESEARCH

GENERAL METHODS 1B1a, 2a1, 2b

-1- -2- -3- -4- -5- -6- -7- -8- -9- -10- -11- -12- -13- -14- -15- -16- -17- -18- -19- -20-

SAMPLE NO.	HZN NO.	DEPTH (CM)	HORIZON	TOTAL CLAY LT <.002	TOTAL SILT .05 LT .002	TOTAL SAND -2 .0002	CLAY FINE LT .002	CO3 CLAY LT .002	SILT FINE .02	SILT COARSE .05	SAND VF .10	SAND F .25	SAND M .50	SAND C -1	SAND VC -2	COARSE FRACTIONS(MM) WEIGHT 2- -5	5- -20	20- -75	>2MM .1- 75	WT PCT OF WHOLE SOIL
				<- - - - - - - - - - - - PCT OF <2MM (3A1) - - - - - - - - - - - ->												<- PCT OF <75MM(3B1)->				
81 755	1S	0- 18	AP	10.5	79.5	8.0			41.7	33.8	2.5	3.3	1.1	0.7	0.4	1	4	--	10	5
81 756	2S	18- 33	A12	17.7	73.7	8.6			42.7	31.0	2.7	3.4	1.0	0.8	0.7	2	4	--	12	6
81 757	3S	33- 46	B21T	22.9	70.9	6.2			45.0	25.9	1.9	2.4	1.0	0.7	0.2	2	3	--	9	5
81 758	4S	46- 74	B22T	21.7	71.1	7.2			46.6	24.6	1.6	2.3	1.2	1.3	0.8	2	2	--	9	4
81 759	5S	74- 91	BX1	20.4	71.5	8.1			42.0	29.5	1.8	3.1	1.1	1.3	0.8	1	5	--	12	6
81 760	6S	91-114	BX2	22.0	66.9	11.1			36.8	28.1	3.8	4.6	1.2	0.9	0.6	1	3	--	11	4

SAMPLE NO.	HZN NO.	ORGN TOTAL C 6A1C	ORGN TOTAL N 6B3A	EXTR TOTAL P	EXTR TOTAL S	EXTRACTABLE FE 6A2H	EXTRACTABLE AL 6G7A	EXTRACTABLE MN 6D2A	CEC 8D1	RATIO/CLAY 15 8AR 8D1	ATTERBERG - LIMITS - LL 4F1	ATTERBERG - LIMITS - PI 4F	BULK DENSITY FIELD MOIST 4A3A	BULK DENSITY 1/3 BAR 4A1D	BULK DENSITY OVEN DRY 4A1H	COLE WHOLE SOIL 4D1	WATER CONTENT 2- BAR 4B1A	WATER CONTENT 0.06 BAR 4B1C	WATER CONTENT 1/3 BAR 4B1C	WATER CONTENT 15 BAR 4B2A	WRD WHOLE SOIL 4C1
		<- - - - - - PCT OF <2MM - - - - - - ->									PCT <0.4MM		<- - G/CC - - ->			CM/CM	<- - -PCT OF <2MM - ->				CM/CM
81 755	1	1.11	0.112						0.57	0.44				1.50			13.2			7.3	
81 756	2	0.83	0.066						0.54	0.44				1.58	1.63	0.010	13.2	22.2	20.9	7.7	0.20
81 757	3	0.30	0.047						0.44	0.44				1.43	1.51	0.018	17.1	27.4	24.2	10.1	0.20
81 758	4	0.20							0.51	0.46				1.36	1.44	0.019	17.3	28.4	24.8	10.0	0.20
81 759	5	0.17							0.51	0.45				1.36	1.41	0.012	14.0		23.8	9.1	0.19
81 760	6	0.11							0.55	0.45				1.50	1.59	0.019	14.7		21.1	9.8	0.16

SAMPLE NO.	HZN NO.	NH4OAC EXTRACTABLE BASES CA 5B5A 6N2E	MG 5B5A 6Q2U	NA 5B5A 6P2E	K 5B5A 6Q2B	SUM BASES	ACID- ITY 6H5A	EXTR AL 6G7A	CEC SUM CA+MG+NA+K+AL 5A3A	CEC NH4- OAC 5A8B	BASES + AL 5A3B	BASE SAT SUM 5G1	BASE SAT NH4 OAC 5C3	CO3 AS CACO3 <2MM 6E1G	RES. GHMS /CM 8E1	COND. MMHOS /CM 8I	PH CACL2 .01M 8C1F	PH H2O 1:1 8C1F
		<- - - - - - - - - - - - MEQ / 100 G - - - - - - - - - - - ->										<- - - - PCT - - - ->						
81 755	1	6.4	0.7	--	0.5	7.6	5.0		12.6	9.4			60	81				5.3	5.8
81 756	2	9.5	0.7	TR	0.2	10.4	2.3		12.7	9.5			82	100	TR			6.8	7.3
81 757	3	6.7	1.0	0.1	0.2	8.0	4.6		12.6	10.1			63	79				5.4	5.9
81 758	4	2.9	1.3	0.1	0.2	4.5	9.7	3.0	14.2	11.0	8.1	44	32	41				4.1	4.6
81 759	5	2.0	1.5	0.1	0.2	3.8	9.4	3.8	13.2	10.4	7.6	50	29	37				4.0	4.6
81 760	6	1.2	2.4	0.1	0.2	3.9	10.3	4.8	14.2	12.0	8.7	55	27	32				3.9	4.5

SAMPLE NO.	HZN NO.	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY X-RAY <2U 7A2I	MINERALOGY CLAY DTA <2U 7A3	MINERALOGY CLAY DTA <2U 7A3	TOT ANL 7C3 CLAY K2O 6Q3A	TOT ANL 7C3 CLAY Fe 6C7A
		<- RELATIVE AMOUNTS ->				<- - - - -PCT - - - ->			
81 755	1								
81 756	2	KK 2	VK 2	MI 2	QZ 1	KK11		1.5	6.3
81 757	3	KK 3	VK 3	MI 2	MI 1	KK23		1.4	7.0
81 758	4								
81 759	5	VK 3	KK 3	MI 2	MI 2	KK19		1.5	7.5
81 760	6								

ESTIMATED BULK DENSITY FOR LAYER 1.

ANALYSES: S= ALL ON SIEVED <2MM BASIS

MINERALOGY: KIND OF MINERAL KK KAOLINITE VK VERMICULITE MI MICA QZ QUARTZ MT MONTMORILL

RELATIVE AMOUNT 0 INDETERMINATE 5 DOMINANT 4 ABUNDANT 3 MODERATE 2 SMALL 1 TRACE

Series: Zanesville taxadjunct[1/].

Pedon Number: S80KY-033-2

Classification: Fine-silty, mixed, mesic Typic **Fragiudults**.

Location: Caldwell County, Kentucky: 2 miles east-southeast on State Highway 278 from its intersection with State Highway 91 in the SE part of Princeton, then 1.1 miles north-northeast on unpaved road and 12 meters NW in field.

Use and Vegetation: Cropland - presently fallow - previously in corn.

Parent Material: Sandstone residuum with some loess influence.

Region: Kentucky and Indiana Sandstone and Shale Hills and Valleys - MLRA 120.

Position: Upland; upper sideslope of convex ridge.

Elevation: ----------

Drainage and Permeability: Moderately well-drained, moderately permeable in upper 74 cm., slowly permeable below.

Water Table and Duration: Perched at about 74 cm. during December to April.

Slope: About 3 percent.

Sampled and Described By: Larry F. Ratliff and Grant Thomas Date: 11-18-80

Ap -- 0 to 18 cm.; dark brown (10YR3/3) silt loam; weak fine and medium subangular blocky structure; hard, friable; common fine and medium roots; few fine pores; many wormcasts; medium acid; clear smooth boundary. (810755).

A12 -- 18 to 33 cm.; dark brown (10YR3/3) silt loam; moderate fine and medium subangular blocky structure; hard, friable; common fine and medium roots; few fine pores; many wormcasts partially filled with B2 material; neutral; clear smooth boundary. (810756).

B21t -- 33 to 46 cm.; dark yellowish brown (10YR4/6) silt loam; weak fine and medium subangular blocky structure; very hard, firm; common fine and medium roots; few fine pores; thin patchy clay films on faces of peds; few crayfish burrows filled with grayish brown fine earth; medium acid; gradual wavy boundary. (810757).

B22t -- 46 to 74 cm.; yellowish brown (10YR5/6) silt loam; weak fine and medium subangular blocky structure; very hard, firm; common fine and medium roots; few fine pores; thin patchy clay films on faces of peds; few fine Fe-Mn concretions; few fine distinct gray (10YR5/1, 6/1) mottles mostly in lower part; very strongly acid; clear smooth boundary. (810758).

Bx1 -- 74 to 91 cm.; pinkish gray (7.5YR6/2) 60 percent, dark brown (7.5YR4/4) and strong brown (7.5YR5/6) 40 percent, silt loam; weak medium and coarse platy structure; very hard, very firm; few fine and medium roots in gray part; few fine pores; estimated 40 percent brittleness in brown parts; few fine Fe-Mn concretions; very strongly acid; clear smooth boundary. (810759).

Bx2 -- 91 to 112 cm.; brown (7.5YR4/4) strong brown (7.5YR5/6) 70 percent, pinkish gray (10YR6/2) silt loam; moderate coarse platy structure; very hard, very firm; few fine roots in gray part; few fine and medium pores; brown parts are brittle; few fine Fe-Mn concretions; very strongly acid; abrupt wavy boundary. (810760).

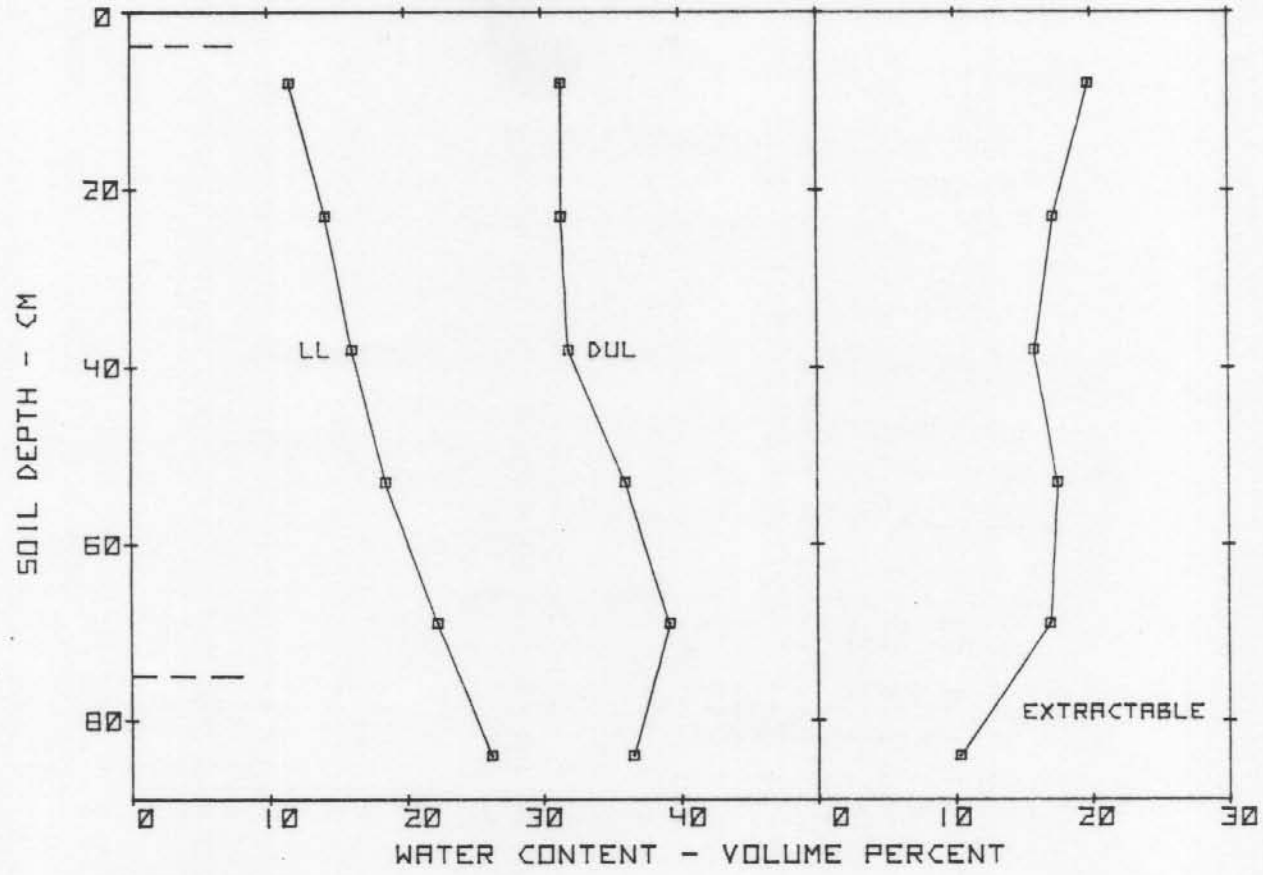
R -- 112 cm.; sandstone bedrock.

Remarks: Colors are for moist soil. [1/]Surface layers are darker in color than allowed in series. Base saturation immediately above bedrock is 8 percent less than allowed for Alfisols. The very coarse prismatic structure typically associated with these soils was not observed in auger samples. The R horizon is possibly fractured but the hand auger was stopped in three separate borings at depths of 110 to 125 cm.

Field Measured Soil Water Data Contributed By: G. W. Thomas and R. E. Phillips, Department of Agronomy, University of Kentucky.

Pedon Number: S80KY-033-2

FIELD MEASURED SOIL WATER LIMITS



ZANESVILLE SIL-CALDWELL CO./KY.-CORN-1980.

SOIL DEPTH Cm.	LL	DUL	EXTRACTABLE
	Volume Percent Water		
0	11.6	31.4	19.8
23	14.2	31.4	17.2
30	16.1	31.9	15.8
53	18.5	36.0	17.5
69	22.3	39.2	16.9
84	26.2	36.5	10.3

TOTAL WATER EXTRACTED FROM PROFILE = 14.9 Cm.

EXTRACTABLE
SUL
LL