

# Characteristics and a New Soil Classification of Key Soils Developed in the Old Reddish Chestnut Zone of Oklahoma

by

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# Characteristics and a New Soil Classification of Key Soils Developed in the Old Reddish Chestnut Zone of Oklahoma

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The majority of soils in western Oklahoma are developing in weakly consolidated, Permian Age sediments that either have been transported or remain as residual-soil materials. These materials date from recent to about 200,000,000 years in age. However, most of the land surfaces will vary between recent and 2,000,000 or Tertiary Age (Figure 1) with many 11,000 years or less.

Regardless of the actual number of years that have passed, the soils are in various stages of development, ranging from moderately developed or mature (soils with B horizons); to very young soils (without B horizons). Those with illuvial B horizons were developed under the influence of mixed grasses, shrubs or small tree grass (Savanna) and dry, subhumid warm climates, and have been classified as Reddish Chestnut soils. Those without illuvial B horizons have been classified as Alluvial,

Research reported herein was conducted under Oklahoma Station project number 567 and 868.

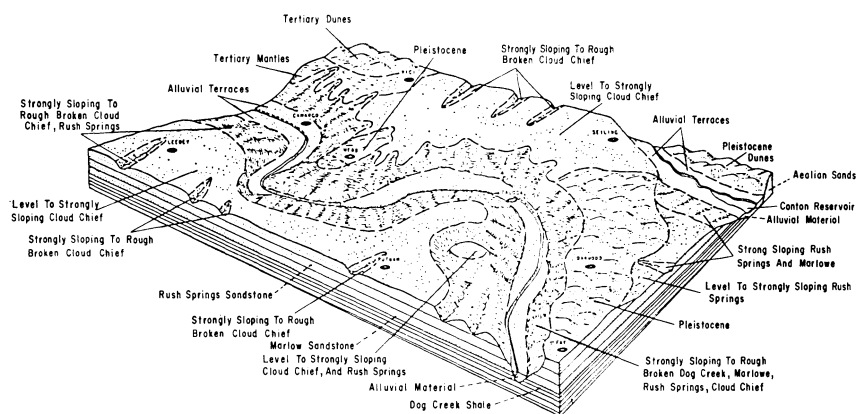


Figure 1. Generalized geology and relief map of Western Oklahoma.

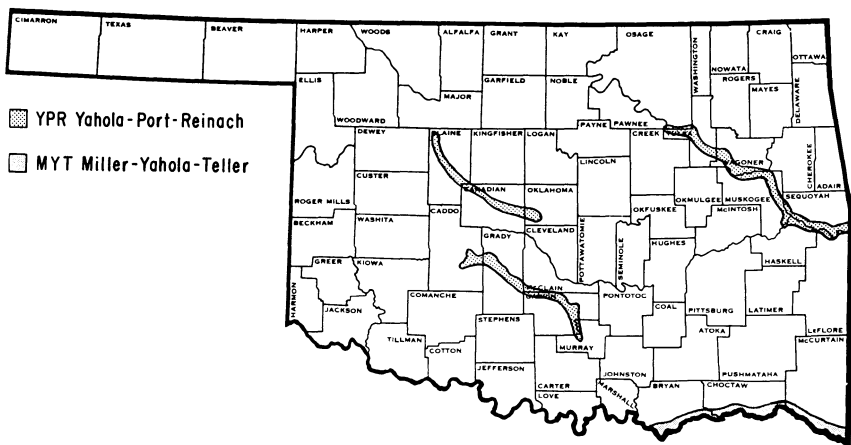
Regosols or Lithosols; depending upon the nature of the underlying material or rocks.

All factors (parent material, climate, living organism (man), vegetation, topography and age) are necessary for soil formation; however, the nature of parent materials, topography-including landforms and age are extremely important in soil formation in western Oklahoma.

The soils vary widely in properties such as texture organic matter, ph, and base status. This publication reports results of studies made to determine the age processes of soil formation leading to slight development or alterations such as color and structure (Cambic B).

Field and laboratory studies were made on soils representing the clayey, loamy and sandy soils of the Rolling Red Plains Soil Resource Area, which totals over nine million acres in Oklahoma. The three major objectives of this study were as follows:

1. To determine the particle-size distribution and organic-matter contents of a variety of soils representing different landforms.
2. Provide a better basis for soil classification of western Oklahoma soils.
3. To provide some quantitative measurements of key soils.



**Figure 2.** (YPR) Yahola-Port-Reinach Soil Association  
(MYT) Miller-Yahola-Teller Soil Association

## Methods

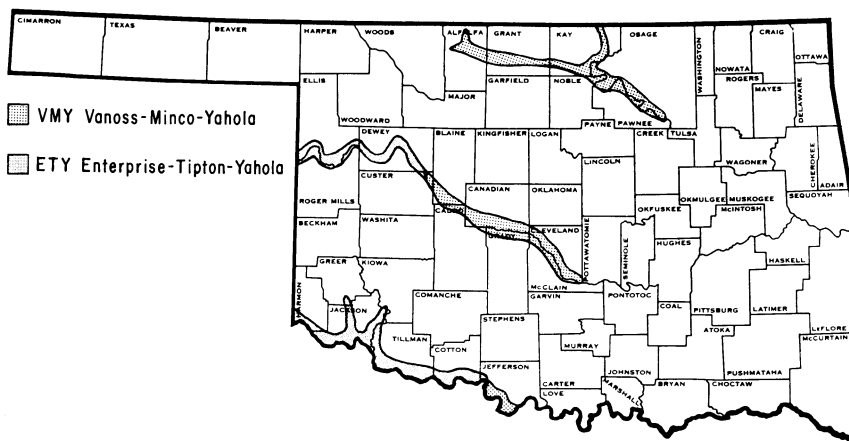
The field studies represent most of the landforms in several areas (Figures 2 through 7). The landforms and geological formations responsible for the soils studied are Rush Springs, Marlow, Duncan, Dog Creek and Hennessey of the Permian Red Beds of which most are shown in Figure 1. Representative soils for the Uplands, Terrace (Pleistocene mantles), and Bottomlands, were sampled by soil scientists of the Soil Conservation Service and/or research people of the experiment station; and were brought to the Soil Survey Research Laboratory of the Agronomy Department, Oklahoma State University. Analyses were made by standard methods.

The descriptions were abbreviated and are shown in Appendix Tables 1-42. These data are of major importance in determining important soil classification criteria such as Mollic Epipedon and Soil Family, as defined by the 7th Approx.<sup>1</sup> now employed in soil survey work in Oklahoma.

## Descriptions of Reddish Chestnut and Associated Soils

Reddish Chestnut soils, which occur in two major soil resource areas of Oklahoma, have been characterized by soils which have dark reddish-

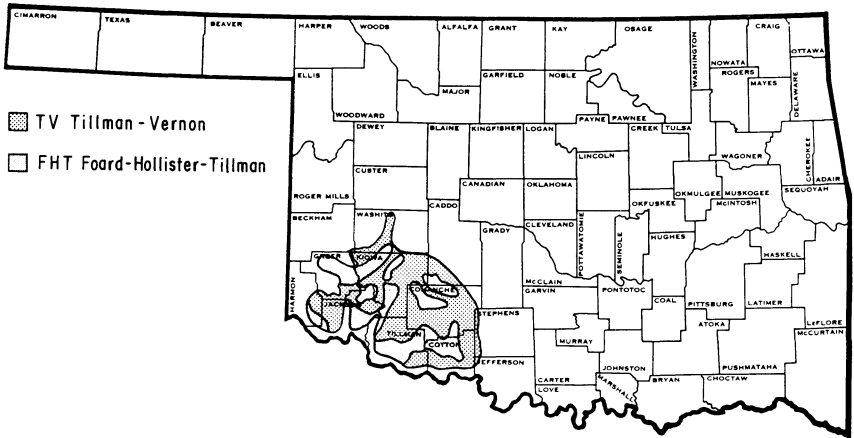
<sup>1</sup> Soil Classification, A Comprehensive System. 7th Approximation. Soil Survey Staff. USDA August 1960 and Supplement to the 7th March 1967.



**Figure 3. (VMY) Vanoss-Minco-Yahola Soil Association  
(ETY) Enterprise-Tipton-Yahola Soil Association**

brown surface horizons and more clayey, reddish brown or red subsoils with lime accumulations at nearly two feet.

The original vegetation was mixed short and tall grasses. Now, these soils are being used mostly for wheat production. The climate is semi-arid to subhumid with average annual rainfall ranging from 26 to 32 inches in the study area. The original vegetation, parent rock and soil classification by the 1938 Yearbook for the soils studied are shown in Tables 1, 2 and 3.



**Figure 4. (TV) Tillman-Vernon Soil Association  
(FHT) Foard-Hollister-Tillman Soil Association**



**Figure 5. (WCQ) Woodward-Carey-Quinlan Soil Association  
(CS) Carey-St. Paul Soil Association**

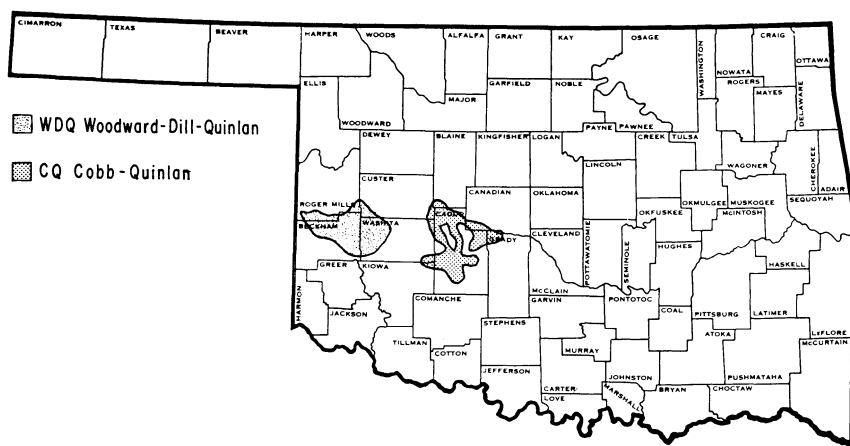
The Foard series occurs in the nearly level uplands of southwestern Oklahoma and developed in reddish, calcareous clays or soft shales of the Wichita and Hennessey formations of Permian Age. Surface crusts and dense, blocky clay pans are special soil features characteristic of the Foard soils.

The Waurika series also occurs in the more level lands and is developed in similar soil parent materials. The soils have similar characteristics to the Foard except for a light-colored or slightly bleached horizon that occurs above the tight claypan. Waurika soils have been classified as Planosols intergrading to Reddish Chestnut.

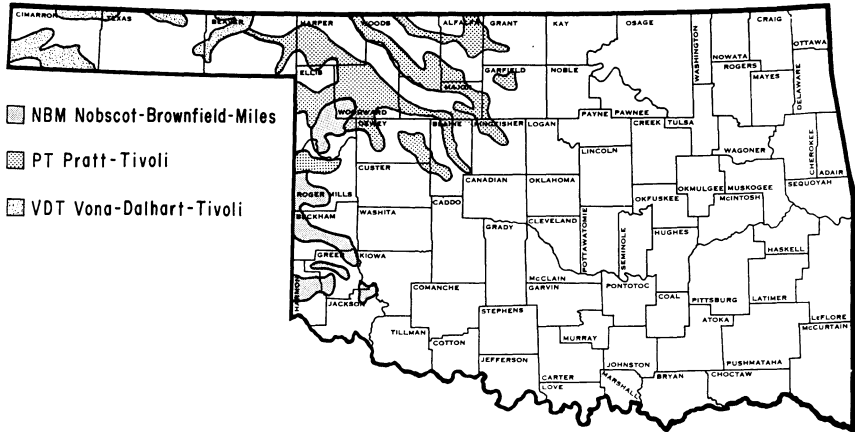
The Carey and St. Paul represent modal or typical soils that normally develop in the Reddish Chestnut zone; therefore, they offer good reference points for comparisons with the soils.

The Carey series occurs on the level to sloping areas of the Rolling Red Plains that are underlain with loamy red calcareous, weakly consolidated Permian sediments. These soils are very productive for wheat but are susceptible to both water and wind erosion. Deterioration of surface presents some problems in the use and management of these soils.

The St. Paul series occurs in association with the Carey on the flats and on the more gentle slopes. They both include deep, dark, well-drained soils but the St. Paul is more brown in the surface horizons and more clayey in the subsurface or B horizons than the Carey. Struc-



**Figure 6. (WDQ) Woodward-Dill-Quinlan Soil Association  
(CQ) Cobb-Quinlan Soil Association**



**Figure 7. (NGM) Nobscot-Grownfield-Miles Soil Association  
(PT) Pratt-Trivoli Soil Association  
(VDT) Vona-Dalhart-Trivoli Soil Association**

ture deterioration which slows water infiltration and leaves surface susceptible to wind erosion presents a problem to a very productive soil.

The Nobscot is a series that will characterize much of the sandy soils, of which there are many varieties. The Nobscot has been classified as a Red Podzolic intergrade because of the leached characteristics of its profiles.

Other sandy soils have been classified as Alluvial soils, Regosols, Lithosols or Reddish Chestnut.

## Discussion of Soil Classification and Use

Soil classifications, according to the 1938 Yearbook of Agriculture, have been utilized in published soil surveys up to the present time. They are listed in Tables 1, 2 and 3. A comprehensive soil classification system has been developed<sup>2</sup> and is being adopted by the Oklahoma Agricultural Experiment Station in cooperation with the Soil Conservation Service.

The categories of the new system include order, suborder, great group, subgroup, family and series. These categories are illustrated in Figure 8 by classifying the St. Paul series. The nomenclature above the series is new and it utilizes names coined from Latin or Greek roots (See Table 4 for some names used in Order and Suborder only).<sup>3</sup>

<sup>2</sup> See footnote one.

<sup>3</sup> The first Comprehensive Soil Classification System by A.A. AANDAHL. Journal of Soil and Water Conservation. Vol. 20, No. 6, p. 243-247.



**Table 1. Names, Locations and Some Factors in Formation and Classification of Soils Studied. (C L A Y E Y )**

| Soil Series | County    | Parent Material                                   | Topography & Landform | Natural Vegetation | Great Soil Group <sup>1</sup>                                 |
|-------------|-----------|---|-----------------------|--------------------|---|
| Foard #1    | Comanche  | Permian formation —<br>(Wichita clays and shales) | Upland flats          | sh. grasses        | Reddish Chestnut  |
| Foard #2    | Cotton    | Permian formation —<br>(Wichita clays and shales) | Upland flats          | sh. grasses        | Reddish Chestnut  |
| Waurika #1  | Jefferson | Permian formation —<br>(Wichita clays and shales) | Upland flats          | sh. grasses        | Planosol<br>Reddish Chestnut<br>Intergrade                    |
| Waurika #2  | Cotton    | Permian formation —<br>(Wichita clays and shales) | Upland flats          | sh. grasses        | Planosol<br>Reddish Chestnut<br>Reddish Prairie<br>Intergrade |

<sup>1</sup> 1938 Yearbook of agricultural classification.

**Table 2. Names, Locations and Some Factors in Formation and Classification of Soils Studied. (LOAMY)**

| Soil Series   | County    | Parent Material                          | Topography & Landform                      | Natural Vegetation         | Great Soil Group                                  |
|---------------|-----------|--|--|----------------------------|---|
| St. Paul #1   | Dewey     | Rush Springs; vf sandstones & siltstones | uplands—very gently sloping, concave       | Mid & Tall grasses         | Reddish Chestnut                                  |
| St. Paul #2   | Woodward  | Rush Springs; vf sandstones & siltstones | uplands—very gently sloping, concave       | Mid & Tall grasses         | Reddish Chestnut                                  |
| Carey #1      | Custer    | Red Cloud Chief siltstones & packsands   | uplands—gently sloping to sloping, convex  | Mid & Tall grasses         | Reddish Chestnut                                  |
| Carey #2      | Custer    | Red Cloud Chief siltstones & packsands   | uplands—gently sloping to sloping, convex  | Mid & Tall grasses         | Reddish Chestnut                                  |
| Reinach 2-1   | Grady     | silty and loamy alluviums                | nearly level, high bottoms or low terraces | grasses & some hard-woods  | Alluvial  |
| Reinach 1-1   | Grady     | silty and loamy alluviums                | nearly level, high bottoms or low terraces | grasses & some hard-woods  | Alluvial  |
| Canadian 44-2 | McClain   | sandy loam alluvium                      | nearly level, high bottomlands             | grasses & some hard-woods  | Alluvial  |
| Canadian 44-1 | McClain   | sandy loam alluvium                      | nearly level, high bottomlands             | grasses & some hard-woods  | Alluvial  |
| Canadian      | Canadian  | sandy loam alluvium                      |  | hardwoods & grasses        | Alluvial  |
| Cyril—1       | Caddo     | sandy calcareous alluvium                | nearly level, small bottomlands            | hardwoods & grasses        | Alluvial  |
| Cyril—2       | Caddo     | sandy calcareous alluvium                | nearly level, small bottomlands            | hardwoods & grasses        | Alluvial  |
| Norwood 75-1  | Washita   | silty alluvium                           | nearly level bottomlands                   | hardwoods & grasses        | Alluvial  |
| Norwood 75-2  | Washita   | silty alluvium                           | nearly level bottomlands                   | hardwoods & grasses        | Alluvial  |
| Norwood #2    | Custer    | silty alluvium                           | nearly level bottomlands                   | hardwoods & grasses        | Alluvial  |
| Norwood #1    | Custer    | silty alluvium                           | nearly level bottomlands                   | hardwoods & grasses        | Alluvial  |
| Teller 34-3   | Jefferson | loamy                                    | nearly level to sloping                    | tall grasses               | Reddish Prairie                                   |
| Teller 34-4   | Jefferson | silty mantle or high terrace             | nearly level to gentle slopes              | tall grasses               | Reddish Prairie                                   |
| Bastrop 34-2  | Jefferson | silty mantle or high terrace             | nearly level to gentle slopes              | tall grasses & mid grasses | Regosol   |
| Bastrop 34-1  | Jefferson | loamy high terrace or mantle deposits    | nearly level to sloping                    | mid & tall grasses         | Regosol   |
| Minco         | Jefferson | loamy or silty mantled wind deposits     | nearly level to sloping                    | mid & tall grasses         | Regosol   |
| Hardeman 71-2 | Tillman   | sandy loam, mantle or terrace deposits   | nearly level to sloping                    | mid & tall grasses         | Regosol   |
| Hardeman 71-1 | Tillman   | sandy loam, mantle or terrace deposits   | nearly level to sloping                    | mid & tall grasses         | Regosol   |
| Cobb          | Caddo     | Rush Springs—sandstone                   | gently sloping upland                      | mid & tall grasses         | Reddish Prairie<br>Reddish Chestnut<br>Intergrade |

**Table 3. Names, Locations, and Some Factors of Formation and Classification of Soils Studied. (SANDY)**

| Soil Series       | County    | Parent Material                             | Topography & Landform                   | Natural Vegetation                     | Great Soil Group           |
|-------------------|-----------|---|---|--|----------------------------|
| Nash-like (05-1)  | Beckham   | Red Bed noncalcareous packsands             | undulating, convex slopes of uplands    | mid grasses                            | Reddish Chestnut (minimum) |
| Dill-like 05-2    | Beckham   | Red Bed noncalcareous packsands             | undulating, convex slopes of uplands    | mid grasses                            | Reddish Chestnut (minimum) |
| Lucien 75-6       | Washita   | Red consolidated non-calcareous sandstones  | gently to strongly sloping upland       | tall & short grasses                   | Lithosol                   |
| Lucien 75-5       | Washita   | Red consolidated non-calcareous sandstones  | gently to strongly sloping upland       | tall & short grasses                   | Lithosol                   |
| Dill 75-3         | Washita   | Red Bed noncalcareous packsands             | undulating convex slopes of uplands     | mid grasses                            | Reddish Chestnut (minimum) |
| Dill 75-4         | Washita   | Red Bed noncalcareous packsands             | undulating convex slopes of uplands     | mid grasses                            | Reddish Chestnut (minimum) |
| Quinlan 8-15      | Caddo     | Red consolidated calcareous sandstones      | gently to strongly sloping uplands      | short & mid grasses                    | Lithosol                   |
| Darnell-like 8-16 | Caddo     | Red consolidated non-calcareous sandstones  | gently to strongly sloping uplands      | tall & short grasses                   | Lithosol                   |
| Nobscot #1        | Woodward  | Loose sandy sediments over red beds         | top & landforms                         | Blackjack, Shinnery Oak & some grasses | Red-Yellow Podzolic        |
| Nobscot #2        | Woodward  | Loose sandy sediments overlying Red Beds    | upland dunes                            | Blackjack, Shinnery Oak & some grasses | Red-Yellow Podzolic        |
| Noble-like 8-13   | Caddo     | sandy, reddish alluvium, colluvium deposits | nearly level to undulating low terraces | tall & mid grasses                     | Alluvial                   |
| Noble 8-12        | Caddo     | sandy, reddish alluvium, colluvium deposits | nearly level to undulating low terraces | tall & mid grasses                     | Alluvial                   |
| Noble 8-11        | Caddo     | sandy, reddish alluvium, colluvium deposits | nearly level to undulating low terraces | tall & mid grasses                     | Alluvial                   |
| Noble 8-14        | Caddo     | sandy, reddish alluvium, colluvium deposits | nearly level to undulating low terraces | tall & mid grasses                     | Alluvial                   |
| Yahola            | Jefferson | sandy alluvium                              | nearly level                            | hardwoods                              | Alluvial                   |

**Table 4. Names, Formative Elements with Connotations of Orders and Selected Suborders.**

| ORDER       |          |                        |  | SUBORDER  |          |                         |  |
|-------------|----------|------------------------|--|-----------|----------|-------------------------|--|
|             |          | Formative Element      |  |           |          | Formative Element       |  |
| Name        | Syllable | Derivation             | Connotation  | Name      | Syllable | Derivation              | Connotation  |
| Entisols    | ent      | Meaningless syllable   | Recent, little or no change of parent material.        | Orthents  | orth     | Gk. orthos, true        | Typical or the common ones                         |
|             |          |                        |  | Psamments | psamm    | Gk. psammos, sand       | Sand textures                                      |
| Vertisols   | ert      | L. verito, turn        | Invert   | Aquepts   | aqu      | L. aqua, water          | Characteristics associated with wetness.           |
|             |          |                        |  | Userts    | ust      | L. ustrus, burnt        | Of dry climates, usually hot in summer.            |
| Inceptisols | ept      | L. inceptum, beginning | Some change or alteration of parent material and moist | Aquepts   | aqu      | L. aqua, water          | Characteristics associated with wetness            |
|             |          |                        |  | Ochrepts  | ochr     | Gk. orchros, pale       | Having an ochric epipedon.                         |
|             |          |                        |  | Umbrepts  | umbr     | L. umbra, shade         | Having an umbric epipedon.                         |
| Aridisols   | id       | L. aridus, dry         | Of arid climates                                       | Argids    | arg      | L. argilla, white       | Having an argillic horizon                         |
|             |          |                        |  | Orthids   | orth     | Gk. orthos, true        | Typical or the common ones.                        |
| Mollisols   | oll      | L. mollis, soft        | Having a mollic epipedon                               | Albolls   | alb      | L. albus, white         | Having an albic horizon                            |
|             |          |                        |  | Aquolls   | aqu      | L. aqua, water          | Characteristics associated with wetness            |
|             |          |                        |  | Borolls   | bor      | L. borealis, north wind | Of cool climates and with a black surface horizon. |
|             |          |                        |  | Udolls    | ud       | L. udus, humid          | Of humid climates                                  |
| Spodosols   | od       | G. spodos, wood ash    | Having a spodic horizon.                               | Xerolls   | xer      | Gk. xeros, dry          | Seasonally dry, when not frozen.                   |
|             |          |                        |  | Ustolls   | ust      | L. ustus, burnt         | Or dry climates, usually hot in summer.            |
|             |          |                        |  | Aquods    | aqu      | L. aqua, water          | Characteristics associated with wetness            |
|             |          |                        |  | Ferrod    | ferr     | L. ferrum, iron         | Presence of iron.                                  |
|             |          |                        |  | Humods    | hum      | L. humus, earth         | Presence of organic matter                         |
|             |          |                        |  | Orthods   | orth     | Gk. orthos, true        | Typical or the common ones                         |

**Table 4. (Cont'd.)**

| ORDER             |          |                      |   | SUBORDER          |          |                         |   |
|-------------------|----------|----------------------|---|-------------------|----------|-------------------------|---|
| Formative Element |          |                      |   | Formative Element |          |                         |   |
| Name              | Syllable | Derivation           | Connotation   | Name              | Syllable | Derivation              | Connotation                             |
| Alfisols          | alf      | Meaningless syllable | Having an argillic horizon with high base status          | Aqualfs           | aqu      | L. aqua, water          | Characteristics associated with wetness |
|                   |          |                      |   | Boralfs           | bor      | L. borealis, north wind | Of cool climates                        |
|                   |          |                      |   | Udalfs            | ud       | L. urus, humid          | Of humid climates                       |
|                   |          |                      |   | Ustalfs           | ust      | L. ustus, burnt         | Of dry climates, usually hot in summer. |
| Ultisols          | ult      | L. ultimus, last     | Ultimate; having an argillic horizon with low base status | Aquults           | aqu      | L. aqua, water          | Characteristics associated with wetness |
|                   |          |                      |   | Humults           | hum      | L. humus, earth         | Presence of organic matter              |
|                   |          |                      |   | Udults            | ud       | L. udus, humid          | Of humid climates                       |
|                   |          |                      |   | Ustults           | ust      | L. ustus, burnt         | Of dry climates, usually hot in summer. |
| Oxisols           | ox       | F. oxide             | Oxides  | INCOMPLETE        |          |                         |   |
| Histosols         | ist      | G. Histos, tissue    | Organic matter  | INCOMPLETE        |          |                         |   |

## Figure 8—Soil Classification—Oklahoma—Criteria for the 7th Approximation Scheme 1966

**SERIES NAME** \_\_\_\_\_

### ORDER:

Epipedon: Mollic\_\_\_\_\_ Ubric\_\_\_\_\_ Ochric\_\_\_\_\_ Albic\_\_\_\_\_

Sub-Surface Horizon: Argillic\_\_\_\_\_ Cambic\_\_\_\_\_ Spodic\_\_\_\_\_ None\_\_\_\_\_

Clayey, with cracking, swelling, sloughing with intersecting slicken-sides and gilgai relief (vertisols): Yes\_\_\_\_\_ No\_\_\_\_\_

Color of Sub-Surface Layers: Hue\_\_\_\_\_ Value\_\_\_\_\_ Chroma\_\_\_\_\_

Distinct or Prominent Mottles: Yes\_\_\_\_\_ No\_\_\_\_\_ Depth\_\_\_\_\_

Iron-Manganese Concretions: Yes\_\_\_\_\_ No\_\_\_\_\_

Percent Base Saturation: B(average)\_\_\_\_\_ B(lower)\_\_\_\_\_ C \_\_\_\_\_ Fragipan (to 30" below top)\_\_\_\_\_

Class Number\_\_\_\_\_ and Name in Order\_\_\_\_\_

### SUBORDER:

Epipedon: (See Order)

Color and Concretions: (See Order)

Texture to 20" or more: Sand or loamy sand\_\_\_\_\_ Finer\_\_\_\_\_

Color Value of Argillic Horizon (Ultisols): Moist\_\_\_\_\_ Dry\_\_\_\_\_

CaCO<sub>3</sub> Content Beneath Mollic Epipedon: Over 40%\_\_\_\_\_ Under 40%\_\_\_\_\_

Spodic Horizon: Chiefly Humus\_\_\_\_\_ Chiefly Iron\_\_\_\_\_ Humus and Iron\_\_\_\_\_

Class Number\_\_\_\_\_ and Name in Suborder\_\_\_\_\_

### GREAT GROUP:

Color and Concretions: (See Order)

Texture: (See Suborder)

Quartz, etc.: Over 95%\_\_\_\_\_ 95% or Less\_\_\_\_\_ Surface Horizon (Vertisols):

Granular\_\_\_\_\_ Massive\_\_\_\_\_

Calcic Horizon Immediately Below Mollic Epipedon: No\_\_\_\_\_ Yes\_\_\_\_\_

If Spodic Horizon: (See Suborder)

Abrupt Textural Change from A to B: Yes\_\_\_\_\_ No\_\_\_\_\_ Fragipan: Yes\_\_\_\_\_ No\_\_\_\_\_

Soil Horizons Intermixed by Spading or by Machines: Yes\_\_\_\_\_ No\_\_\_\_\_

Color Values Argillic Horizon (Rhodochults): See Suborder.

Class Number\_\_\_\_\_ and Name in Great Group\_\_\_\_\_

### SUBGROUP:

Texture finer than loamy very fine sand in all or part of upper 20": Yes\_\_\_\_\_ No\_\_\_\_\_

If sandy in upper part, is it: Over 30" thick\_\_\_\_\_ 20-30" thick\_\_\_\_\_ less than 20" thick\_\_\_\_\_

Color of Horizons Below A<sub>1</sub>: Dominant Chroma\_\_\_\_\_ Chroma of Mottle\_\_\_\_\_

If Dominant Chroma is low, is it at: Less than 20"\_\_\_\_\_ 20-40"\_\_\_\_\_ None within 40"\_\_\_\_\_

If Gray Mottles are present are they at: 0-10"\_\_\_\_\_ 10-20"\_\_\_\_\_ 20-40"\_\_\_\_\_

None within 40"\_\_\_\_\_

Lithic Contact at: Less than 20"\_\_\_\_\_ 20-40"\_\_\_\_\_ More than 40"\_\_\_\_\_

Organic Matter decreases irregularly with depth: Yes\_\_\_\_\_ No\_\_\_\_\_

Insoluble Minerals: (See Great Group)

Surface Soil (Vertisols): 12" or more\_\_\_\_\_ less than 12"\_\_\_\_\_

Darker than Value of 3.5: Yes\_\_\_\_\_ No\_\_\_\_\_ Granular\_\_\_\_\_ Massive\_\_\_\_\_

**(SUBGROUP, Continued)**

Umbric Epipedon (Typic Haplumbrepts) 12-20" thick: Yes\_\_\_\_\_ No\_\_\_\_\_

CaCO<sub>3</sub> Content of "C" (Eutrochrepts) Over 40%\_\_\_\_\_ 40%\_\_\_\_\_ or less

Calcic Horizon: Yes\_\_\_\_\_ No\_\_\_\_\_

Mollic Epipedon (Mollisols): Less than 8" thick\_\_\_\_\_ 8-20"\_\_\_\_\_ Over 20"\_\_\_\_\_

Carbonates in Mollic Epipedon: Yes\_\_\_\_\_ No\_\_\_\_\_

Carbonates in Argillic or Cambic Horizon: Yes\_\_\_\_\_ No\_\_\_\_\_

Spodic Horizon: Friable\_\_\_\_\_ Very Firm\_\_\_\_\_ Over 4" thick\_\_\_\_\_ Less than 4" thick\_\_\_\_\_

Abrupt Textural Change, A to B (Alfisols): Yes\_\_\_\_\_ No\_\_\_\_\_

Fragipan: Yes\_\_\_\_\_ No\_\_\_\_\_

Ap Moist Value: 3 or less\_\_\_\_\_ Over 3\_\_\_\_\_

Mottles in upper 10" or Argillic Horizon (Alfisols): Yes\_\_\_\_\_ No\_\_\_\_\_

Argillic Horizon: Moist Value—Less than 4\_\_\_\_\_ 4 or more\_\_\_\_\_

Argillic Horizon: If Hue is 7.5YR or redder, or Base Saturation is less than 50%—Chroma is less than 6\_\_\_\_\_ 6 or more\_\_\_\_\_

Moist Value: Less than 4\_\_\_\_\_ 4 or more\_\_\_\_\_

Dry Value\_\_\_\_\_ No more than 1 unit higher than moist: Yes\_\_\_\_\_ No\_\_\_\_\_

Class Number \_\_\_\_\_ Name in Subgroup\_\_\_\_\_

**FAMILY:**

**Texture:** Of Argillic Spodic or Fragipan Horizon, or Ap or 10" (whichever is shallower).  
 Fragmental\_\_\_\_\_ Skeletal\_\_\_\_\_ Light Loamy\_\_\_\_\_ Heavy Loamy\_\_\_\_\_Light Silty  
 \_\_\_\_\_ Fine\_\_\_\_\_

Compound:\_\_\_\_\_ over \_\_\_\_\_ at \_\_\_\_\_ inch depth.

**Mineralogy:** Of material less than 2mm from surface to base of Argillic, Spodic or Fragipan Horizon, or to 30" or Lithic Contact, whichever is shallower: Carbonatic\_\_\_\_\_ Sulfatic\_\_\_\_\_ Micaceous\_\_\_\_\_ Siliceous\_\_\_\_\_ Mixed\_\_\_\_\_ Oxidic\_\_\_\_\_ Silicate  
 \_\_\_\_\_ Phosphatic\_\_\_\_\_ Calcareous\_\_\_\_\_

**Reaction:** (For Entisols, other than Psamments, and for Aquepts)  
 Acid: pH less than 6 in depth of 6-30"\_\_\_\_\_

Non-Acid: pH more than 6 at some depth above 30", non-calcareous in the fine earth (less than 2 mm) between 10-20"\_\_\_\_\_. Calcareous (fine earth) between 10 and 20"\_\_\_\_\_.

**Bulk Density** (If needed): Less than 1.5\_\_\_\_\_ 1.5-1.65\_\_\_\_\_ More than 1.65\_\_\_\_\_

**Permeability** (If needed) or 6-30" zone: Slow\_\_\_\_\_ Moderate\_\_\_\_\_ Rapid\_\_\_\_\_

Compound:\_\_\_\_\_ over \_\_\_\_\_ at \_\_\_\_\_ inch depth.

**Wetness:** Small differences in depth to mottles of low chroma. Tentatively set as follow—  
 For soils with B horizons: Upper 6" of B\_\_\_\_\_ Within 6-14" of top of B\_\_\_\_\_ Within 14-23" of top of B\_\_\_\_\_

Or, for soils with no B horizon: 0-10"\_\_\_\_\_ 10-20"\_\_\_\_\_ 20-30'\_\_\_\_\_ 30-40"\_\_\_\_\_ over 40"\_\_\_\_\_

**Other:** Family\_\_\_\_\_

**Figure 8. Soil Classification-Oklahoma-Criteria for the 7th Approximation Scheme 1966.**

Diagnostic horizons are the main features of the new system. They are either measured or observed combinations of soil characteristics. Several new terms have been defined. A soil pedon is the smallest area of soil that can be called a soil. It permits sampling and studying all horizons. Following are a few of these diagnostic horizons and some other definitions. Epipedons are those diagnostic horizons which have formed at the surface of the pedon. Mollic epipedons are dark colored, contain more than one percent organic matter and generally are more than seven inches thick. Mollic epipedons also must have more than 50 percent base saturation, and they cannot be both hard or massive. St. Paul is a good example. See other examples and criteria in Figure 10.

Umbric epipedons are similar to mollic epipedons but differ in being hard and massive or by having a lower base saturation.

Ochric epipedons are too light in color or too low in organic matter, or too thin to be either mollic or umbric epipedons. Most of the soils in western Oklahoma have ochric epipedons; however many have mollic epipedons.

Most diagnostic horizons are formed below the surface. Argillic horizons are horizons in which clay has accumulated. They have more clay than the horizons above them. See clay contents in Figure 10. Natric are a special kind of argillic horizons with more than 15 percent exchangeable sodium. Calcic horizons have more than 15 percent calcium carbonate and 5 percent more than the horizon below. Cambic horizons are altered horizons that have loamy very fine sand or finer texture but have a minimum of development. The evidences of development are soil structure, browner or redder colors than in the parent materials, movement of carbonates, and some evidences of wetness (gray colors). Soil temperatures, soil mineralogy and soil texture (see Figure 9) along with several other properties are useful in soil family classifications. The clay mineralogy of the soils studied is predominantly mixed (illitic and montmorillonitic.)

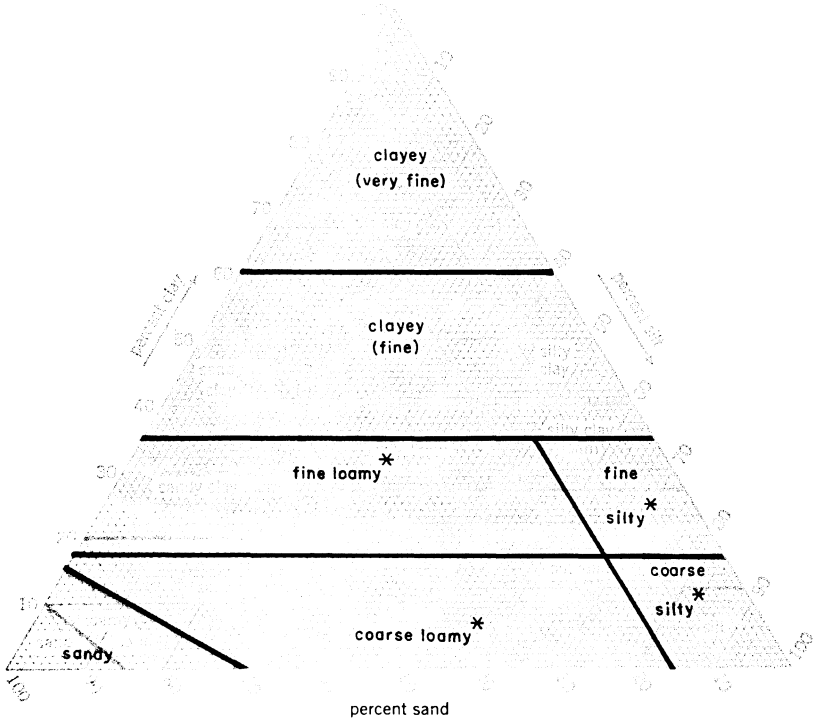
Some subgroup names used other than typic are cumulic (accumulations), pachic (thick epipedon), lithic (rock contact) arenic (sandy), and fluventic (flood plains).

Improvements are to be made in the new system as more information on soils becomes available.

The new system will permit more reliable interpretations. The phases of soil families will permit rather precise statements about the plant responses to alternative management systems and many non-agricultural interpretations, such as engineering.

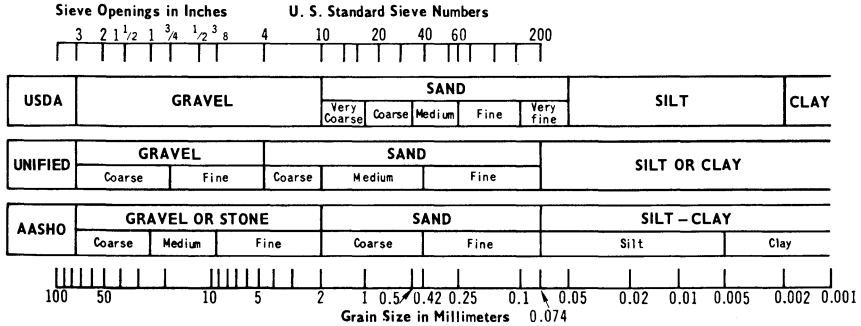


**GUIDE FOR TEXTURAL CLASSIFICATION IN SOIL FAMILIES**



\* Very fine sand (0.05 - 0.1) is treated as silt for family groupings; coarse fragments are considered the equivalent of coarse sand in the boundary between the silty and loamy classes.

**COMPARISON OF PARTICLE SIZE SCALES**



**Figure 9. Guide for Textural Classification in Soil Families.**

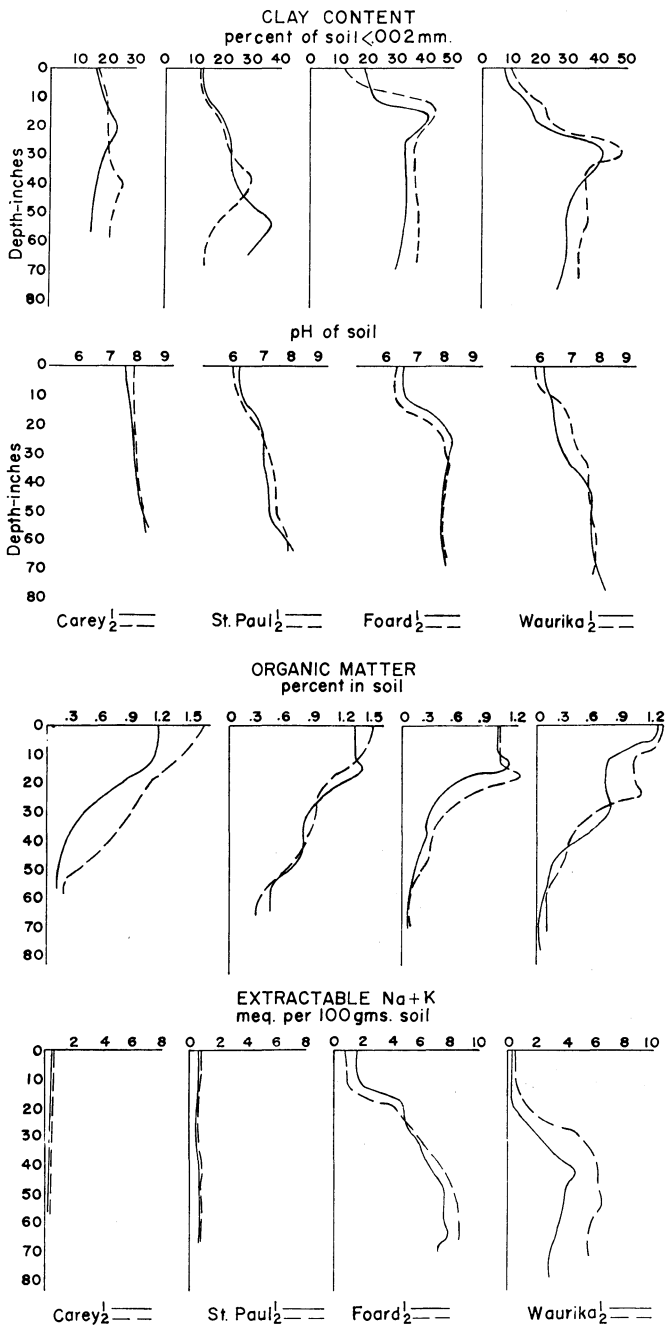


Figure 10. Soil Properties of Mollisol and Mollisol-Alfisol Intergrades.

Soil series cannot have a wider range of properties than the soil families.

Attempts were made to determine the diagnostic horizons for the soils studied and classify them according to the new system.

Quantitative data along with abbreviated morphology and classification in Order, Subgroup and Family are presented in tabular form for all the soils studied. For convenience and interpretation, they are grouped into three landforms: (1) upland (2) mantle or terrace (3) bottomlands.

## Conclusions

1. Soils with mollic epipedons occur on broad upland flats and in bottomlands where not only organic matter accumulates in soils from the vegetation but also from accumulation from the eroding uplands.
2. Under natural conditions, soils of the convex and sloping uplands accumulate about 1 percent organic matter; thus after being cultivated, do not have mollic surface horizons. Therefore, they belong to the Alfisol or Inceptisol Order rather than Mollisol.
3. Maximum age in soil development of Mollisols ranges between Carey-1 and Waurika-2.
4. The new system offers a means of soil classification whereby all soils can be classified, especially when quantitative data are available. Several intergrades such as Waurika occur in western Oklahoma.
5. Carey, St. Paul, Teller, Minco, and Reinach are modal Mollisols; whereas, Cobb, Hardeman, and Noble are Alfisols; Dill, Quinlan, and Darnell are Inceptisols; and, Yahola is a typical Entisol, the youngest soil studied in this area.

## References

1. Kilmer, V. J. and Alexander, L. T. Methods of making mechanical analysis of soils. *Soil Sci.* 68:15-24. 1949.
2. \_\_\_\_\_ and Mullins, J. F. Improved stirring and pipetting apparatus for mechanical analysis of soils. *Soil Sci.* 77:437-441. 1954.

3. Olmstead, L. B., Alexander, L. T. and Middleton, H. E. A pipette method of mechanical analysis of soils based on improved dispersion procedure. USDA Tech. Bul. 170. 1930.
4. Peech, M., Alexander, L.T., Dean, L.A. and Reed, J.F. Methods of soil analysis for soil-fertility investigations. USDA, Cir. 757. 1947.
5. Association of Official Agricultural Chemists. Official and tentative methods of analysis. Washington, D.C. Ed. VI, p. 4. 1945.
6. Richard, L.A., ed. Diagnosis and improvement of saline and alkali soils. U.S. Salinity Laboratory. USDA Handbook '60. 1954.
7. Kilmer, V.J. The estimation of free iron oxides in soils. SSSA Proc. Vol. 24, p. 420. 1960.

## Appendix

The following abbreviations and notations were used in briefing the profile descriptions in Appendix—Tables 1-42.

**Horizon:** The standard horizon nomenclature was used.

**Depth:** In inches from the top of A1.

**Color:** Soil colors are indicated by using the appropriate Munsell notation, such as 5YR 5/3. D (dry) and m (moist).

**Texture:** The following abbreviations were used:

|                               |                             |
|-------------------------------|-----------------------------|
| gravel _____g                 | gravelly sandy loam ____gsl |
| very coarse sand _____vcos    | loam _____l                 |
| coarse sand _____cos          | gravelly loam _____gl       |
| sand _____s                   | stony loam _____stl         |
| fine sand _____fs             | silt _____si                |
| very fine sand _____vfs       | silt loam _____sil          |
| loamy coarse sand _____lcos   | clay loam _____cl           |
| loamy sand _____ls            | silty clay loam _____sicl   |
| loamy fine sand _____lfs      | sandy clay loam _____scl    |
| sandy loam _____sl            | stony clay loam _____stcl   |
| fine sandy loam _____fsl      | silty clay _____sic         |
| very fine sandy loam ____vfsl | clay _____c                 |

**Structure:** The terms used are—

Size or class:

very fine \_\_\_\_\_vf  
 fine \_\_\_\_\_f  
 medium \_\_\_\_\_m  
 coarse \_\_\_\_\_c  
 very coarse \_\_\_\_\_vc

Grade or distinctness:

structureless \_\_\_\_\_0  
 weak \_\_\_\_\_1  
 moderate \_\_\_\_\_2  
 strong \_\_\_\_\_3

Form or types:

platy \_\_\_\_\_pl  
 prismatic \_\_\_\_\_pr  
 columnar \_\_\_\_\_cpr  
 blocky \_\_\_\_\_bk  
 angular blocky \_\_\_abk  
 subangular blocky \_sbk  
 granular \_\_\_\_\_gr  
 crumb \_\_\_\_\_cr  
 single grain \_\_\_\_\_sg  
 massive \_\_\_\_\_m

**Consistence:** The notation of consistence varies with moisture content.

Wet soil:

nonsticky \_\_\_\_\_wso  
 slightly sticky \_\_\_\_\_wss  
 sticky \_\_\_\_\_ws  
 very sticky \_\_\_\_\_wvs  
 nonplastic \_\_\_\_\_wpo  
 slightly plastic \_\_\_\_\_wps  
 plastic \_\_\_\_\_wp  
 very plastic \_\_\_\_\_wvp

Moist soil:

loose \_\_\_\_\_ml  
 very friable \_\_\_\_\_mvfr  
 friable \_\_\_\_\_mfr  
 firm \_\_\_\_\_mfi

very firm \_\_\_\_\_mvfi  
 extremely firm \_\_\_\_\_mefi

Dry soil:

loose \_\_\_\_\_dl  
 soft \_\_\_\_\_ds  
 slightly hard \_\_\_\_\_dsh  
 hard \_\_\_\_\_dh  
 very hard \_\_\_\_\_dvh  
 extremely hard \_\_\_\_\_deh

Cementation:

weakly cemented \_\_\_\_\_cw  
 strongly cemented \_\_\_\_\_cs  
 indurated \_\_\_\_\_ci

**Appendix Table 1.—WAURIKA SILT LOAM NO. 1 (59-OK-17-1)**

|   |  |
|---|--|
| Location: 3 mi. E. and 1 mi. S. of Temple, Okla. 100 ft. W. and 190 ft. S. of the N.E. corner of Sec. 31, T3S, R9W. Cotton County, Oklahoma | Cultivated or Virgin: cultivated<br>Relief: nearly level<br>Order: Alfisol<br>Subgroup: Mollic Albaqualf<br>Family: fine, mixed, thermic |
|---|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure | Consistence |
|---------|-------------|------------|---------|-----------|-------------|
| A1p     | 0-6         | 10 YR 5/2  | sil     | 1pl       | mfr, ds     |
| A12     | 6-10        | 10 YR 4/2  | sil     | gr        | mfr, ds     |
| A2      | 10-12       | 10 YR 6/2  | sil     | 0         | mvfi, dvh   |
| B21t    | 12-14       | 10 YR 4/2  | c       | 2mcabk    | mvfi, dvh   |
| B22t    | 24-32       | 10 YR 3/2m | sic     | 2mabk     | mvfi, dvh   |
| B3ca    | 32-39       | 10 YR 4/2m | sicl    | 1bk       | mfi         |
| C-1     | 39-50       | 10 YR 4/2m | sicl    | 1fmsbk    | mfi, wvs    |
| C-2     | 50-57       | 10 YR 4/2m | sicl    | 0         | mfi, wvs    |
| C-3     | 57-72       | 10 YR 4/2m | cl      | 0         | mfr         |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |      |     |     |      | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|------|-----|-----|------|--|
|         |                              |                  |      |                 | Ca                              | Mg   | K   | Na  | H    |  |
| A1p     | 5.9                          | 1.3              | .058 | 9.4             | 6.1                             | 2.0  | 0.4 | 0.1 | 3.1  | 0.6  |
| A12     | 6.6                          | 1.3              | .064 | 12.9            | 8.6                             | 3.4  | 0.3 | 0.5 | 3.4  | 0.8  |
| A2      | 7.0                          | 1.0              | .053 | 14.8            | 8.8                             | 3.6  | 0.2 | 0.8 | 2.6  | 0.8  |
| B21t    | 7.3                          | 1.1              | 0.56 | 33.8            | 22.0                            | 12.0 | 0.5 | 4.2 | 2.5  | 1.2  |
| B22t    | 7.8                          | .8               |      | 28.9            | 24.2                            | 10.9 | 0.4 | 5.4 | 0.2  | 0.9  |
| B3ca    | 7.7                          | .4               |      | 25.2            | 28.4                            | 9.9  | 0.4 | 5.8 | <0.1 | 0.7  |
| C-1     | 7.8                          | .3               |      | 25.7            | 19.7                            | 9.4  | 0.4 | 6.2 | 0.2  | 0.7  |
| C-2     | 7.9                          | .2               |      | 24.7            | 17.0                            | 8.8  | 0.4 | 6.1 | 0.5  | 0.9  |
| C-3     | 7.8                          | .1               |      | 23.1            | 13.9                            | 7.5  | 0.4 | 5.2 | 1.2  | 1.2  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1p     | 22.7                          | 63.0 | 14.3 | 24.1                 | 15.3       | 5.0       | 1.42         |
| A12     | 19.7                          | 59.3 | 21.0 | 25.2                 | 19.3       | 7.5       |              |
| A2      | 20.1                          | 57.5 | 22.4 | 26.1                 | 20.0       | 8.0       |              |
| B21t    | 12.8                          | 38.2 | 49.0 | 40.0                 | 35.5       | 19.4      | 1.84         |
| B22t    | 15.3                          | 42.3 | 42.4 | 37.3                 | 44.4       | 15.6      |              |
| B3ca    | 18.0                          | 46.0 | 36.0 | 35.2                 | 28.2       | 14.2      |              |
| C-1     | 17.8                          | 45.2 | 37.0 | 35.6                 | 29.6       | 15.1      |              |
| C-2     | 19.3                          | 43.8 | 36.9 | 34.0                 | 29.8       | 15.0      |              |
| C-3     | 24.7                          | 40.8 | 34.5 | 36.5                 | 27.7       | 13.4      | 1.82         |

**Appendix Table 2.—WAURIKA SILT LOAM NO. 2 (59-OK-34-1)**

|   |  |
|---|--|
| Location: 2 mi. E. and 1/2 mi. N. of intersection of U.S. Highways 70 and 81, E. of Waurika, Okla. 127 ft. S. and 315 ft. E. of the W. 1/4 corner of Sec. 33, T4S, R7W. Jefferson County, Okla. | Cultivated or Virgin: cultivated<br>Relief: nearly level<br>Order: Alfisol<br>Subgroup: Mollic Albaqualf<br>Family: fine, mixed, thermic |
|---|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure | Consistence |
|---------|-------------|------------|---------|-----------|-------------|
| A1p     | 5-0         | 10 YR 5/2  | sil     | 0         | mvfr; dsh   |
| A12     | 5-10        | 10 YR 4/2  | sil     | 2fgr      | mfr, dsh    |
| A2      | 10-14       | 10 YR 6/2  | sil     |           | msfi, dsh   |
| B21t    | 14-24       | 10 YR 4/2  | c       | 3mabk     | mvfi, dvh   |
| B22t    | 24-33       | 10 YR 3/3m | cl      | 3mabk     | mvfi, dvh   |
| B3      | 33-39       | 10 YR 3/3m | cl      | 1msbk     | mfi, dvh    |
| B3ca    | 39-44       | 10 YR 4/3m | cl      | 2-1sbk    | mfr         |
| C-1     | 44-59       | 5 YR 5/4   | cl      | 1-2msbk   | mfr-msfi    |
| C-2     | 59-68       | 2.5 YR 5/6 | cl      | -----     | -----       |
| C-3     | 68-78       | 2.5 YR 5/6 | 1/cl    | -----     | -----       |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water |  | % Organic | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |      |     |      |     | Free Iron %<br>Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------|--|-----------|------|-----------------|---------------------------------|------|-----|------|-----|---|
|         | ratio                  |  |           |      |                 | Ca                              | Mg   | K   | Na   | H   |   |
| A1p     | 6.2                    |  | 1.2       | .058 | 7.6             | 4.4                             | 1.6  | 0.4 | <0.1 | 2.8 | 0.5   |
| A12     | 6.4                    |  | 1.0       | .055 | 10.2            | 6.4                             | 2.5  | 0.2 | 0.1  | 2.8 | 0.7   |
| A2      | 6.5                    |  | .7        | .041 | 11.3            | 6.4                             | 3.0  | 0.2 | 0.2  | 3.1 | 0.8   |
| B21t    | 6.7                    |  | .8        | .044 | 25.1            | 15.3                            | 9.3  | 0.5 | 1.5  | 4.6 | 1.3   |
| B22t    | 7.3                    |  | .8        |      | 24.2            | 15.7                            | 10.0 | 0.4 | 2.8  | 2.4 | 1.3   |
| B3      | 7.7                    |  | .6        |      | 23.9            | 20.1                            | 10.6 | 0.4 | 4.5  | 0.5 | 1.1   |
| B3ca    | 7.8                    |  | .3        |      | 18.5            | 16.2                            | 8.5  | 0.3 | 4.3  | 0.2 | 1.1   |
| C-1     | 7.8                    |  | .1        |      | 15.6            | 12.7                            | 6.7  | 0.3 | 3.6  | 1.0 | 1.5   |
| C-2     | 7.9                    |  | .0        |      | 16.8            | 11.5                            | 6.1  | 0.3 | 3.0  | 0.5 | 2.0   |
| C-3     | 8.3                    |  | .0        |      | 15.7            | --                              | --   | 0.2 | 2.6  | --  | 1.8   |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1p     | 31.6                          | 58.2 | 10.2 | 22.2                 | 14.7       | 4.0       |              |
| A12     | 26.4                          | 57.0 | 16.6 | 24.9                 | 17.4       | 5.8       | 1.47         |
| A2      | 25.7                          | 56.0 | 18.3 | 26.4                 | 19.9       | 6.8       |              |
| B21t    | 20.4                          | 37.6 | 42.0 | 36.3                 | 29.4       | 16.5      |              |
| B22t    | 23.3                          | 38.3 | 38.4 | 35.0                 | 27.9       | 15.1      | 1.89         |
| B3      | 23.6                          | 39.0 | 37.4 | 36.0                 | 29.1       | 14.9      |              |
| B3ca    | 30.5                          | 37.2 | 32.3 | 33.8                 | 25.8       | 12.9      |              |
| C-1     | 36.4                          | 34.6 | 29.0 | 31.0                 | 24.4       | 11.6      | 1.84         |
| C-2     | 22.0                          | 47.9 | 30.1 | 31.8                 | 24.6       | 12.1      |              |
| C-3     | 30.0                          | 43.5 | 26.5 | 28.5                 | 22.8       | 10.3      |              |

**Appendix Table 3.—FOARD SILT LOAM NO. 1 (59-OK-16-1)**

|  |  |
|--|--|
| Location: 2 mi. N.E. of Chattanooga, Okla. 67 ft. E. and 950 ft. N. of S.W. corner of Sec. 23, T1S, R14W. Comanche County, Okla. | Relief: nearly level<br>Order: Mollisol<br>Subgroup: Typic Natrustoll<br>Family: fine, montmorillonitic, thermic |
| Cultivated or Virgin: cultivated   |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure | Consistence |
|---------|-------------|------------|---------|-----------|-------------|
| Ap      | 0-8         | 10 YR 5/2  | sil     | 0         | mfr, dh     |
| B21t    | 8-14        | 10 YR 4/2  | sic     | 2mfsbk    | mfi, dvh    |
| B22t    | 14-21       | 10 YR 4/2  | sic1    | 1msbk     | mvfi, dvh   |
| Bca1    | 21-30       | 10 YR 4/2  | sic1    | m         | mfi, dh     |
| Bca2    | 30-44       | 10 YR 4/2  | sic1    | m         | mfi, dh     |
| B3      | 44-54       | 7.5 YR 6/4 | sic1    | 1-2msbk   | mfi, dvh    |
| C-1     | 54-64       | 7.5 YR 6/4 | sic1/cl | 1cbk      | mfi, dvh    |
| C-2     | 64-70       | 7.5 YR 6/4 | cl      | 1cbk      | mfi, dvh    |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |      |     |     |     | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|------|-----|-----|-----|--|
|         |                              |                  |      |                 | Ca                              | Mg   | K   | Na  | H   |  |
| Ap      | 6.6                          | 1.0              | .055 | 17.0            | 8.8                             | 5.6  | 0.4 | 1.3 | 3.1 | 0.7  |
| B21t    | 7.7                          | 1.2              | .067 | 31.8            | 16.8                            | 13.1 | 0.5 | 4.2 | 2.4 | 0.9  |
| B22t    | 8.3                          | .6               | .038 | 23.9            |                                 |      | 0.4 | 4.5 |     | 0.6  |
| Bca1    | 8.2                          | .4               | .022 | 24.2            |                                 |      | 0.4 | 5.8 |     | 0.6  |
| Bca2    | 8.1                          | .2               |      | 25.4            |                                 |      | 0.4 | 7.2 |     | 0.6  |
| B3      | 7.9                          | .1               |      | 24.6            |                                 |      | 0.4 | 7.1 |     | 0.8  |
| C-1     | 8.0                          | .1               |      | 22.6            |                                 |      | 0.4 | 7.8 |     | 0.8  |
| C-2     | 8.1                          | .1               |      | 21.0            |                                 |      | 0.4 | 6.8 |     | 0.8  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| Ap      | 18.4                          | 60.0 | 21.6 | 32.5                 | 21.0       | 8.6       |              |
| B21t    | 12.2                          | 45.4 | 42.4 | 46.5                 | 34.3       | 17.5      | 1.73         |
| B22t    | 16.8                          | 49.6 | 33.6 | 39.7                 | 28.6       | 13.8      |              |
| Bca1    | 16.9                          | 49.4 | 33.7 | 37.7                 | 27.3       | 13.5      | 1.71         |
| Bca2    | 16.5                          | 48.3 | 35.2 | 38.2                 | 27.6       | 14.2      |              |
| B3      | 18.2                          | 47.4 | 34.4 | 37.2                 | 28.2       | 14.0      |              |
| C-1     | 19.5                          | 47.4 | 33.1 | 39.2                 | 26.6       | 14.0      | 1.77         |
| C-2     | 21.9                          | 46.9 | 31.2 | 36.4                 | 27.4       | 13.5      |              |



**Appendix Table 4.—FOARD SILT LOAM NO. 2 (59-OK-17-2)**

|  |   |
|--|---|
| Location: 5 mi. W. and 2¼ mi. N.<br>of Emmerson, Okla. 100<br>ft. E. and 1320 ft. N. of<br>S.W. corner of Sec. 11,<br>T2S, R13W. Cotton<br>County, Okla.<br>Cultivated or Virgin: cultivated | Relief: nearly level<br>Order: Mollisol<br>Subgroup: Typic Natrustoll<br>Family: fine, montmorillonitic,<br>thermic |
|--|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure | Consistence |
|---------|-------------|------------|---------|-----------|-------------|
| Ap      | 0-9         | 10 YR 5/3  | sil     | 1fgr      | mfr, dsh    |
| B21t    | 9-17        | 7.5 YR 4/2 | sic     | 3mabk     | mvfi, dvh   |
| B22t    | 17-22       | 7.5 YR 4/2 | sic     | 2msbk     | mvfi, dvh   |
| Bca1    | 22-29       | 7.5 YR 4/4 | sic1    | 1bk       | mvfi, dvh   |
| Bca2    | 29-38       | 10 YR 5/3  | sic1    | vlbk-m    | mvfi, dvh   |
| B31     | 38-48       | 7.5 YR 5/2 | sic1    | vlcsbk    | mfi, dvh    |
| B32     | 48-56       | 5 YR 5/6   | sic1    | 1bk       | mfi, dvh    |
| C       | 56-66       | 5 YR 4/6   | sic1    | 2bk       | mvfi        |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. mc/100g. | Exchangeable Cations me/100gms. |      |     |     |     | Free Iron %<br>Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|------|-----|-----|-----|---|
|         |                              |                  |      |                 | Ca                              | Mg   | K   | Na  | H   |   |
| Ap      | 6.4                          | 1.0              | .051 | 10.8            | 6.3                             | 3.1  | 0.4 | 0.6 | 2.9 | 0.7   |
| B21t    | 7.7                          | 1.3              | .074 | 30.3            | 18.6                            | 10.9 | 0.5 | 3.8 | 2.5 | 1.2   |
| B22t    | 7.9                          | 1.0              | .059 | 30.4            | 18.2                            | 11.7 | 0.4 | 4.5 | 1.5 | 1.2   |
| Bca1    | 8.2                          | .6               | .032 | 24.2            |                                 |      | 0.4 | 5.8 |     | 0.9   |
| Bca2    | 8.2                          | .4               |      | 25.1            |                                 |      | 0.4 | 7.4 |     | 0.8   |
| B31     | 8.0                          | .3               |      | 25.9            |                                 |      | 0.4 | 8.0 |     | 0.9   |
| B32     | 8.0                          | .2               |      | 26.2            |                                 |      | 0.4 | 8.5 |     | 1.1   |
| C       | 8.1                          | .1               |      | 26.1            |                                 |      | 0.4 | 8.1 |     | 1.3   |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| Ap      | 21.9                          | 62.5 | 15.6 | 28.9                 | 15.6       | 5.6       |              |
| B21t    | 13.4                          | 42.6 | 44.0 | 44.8                 | 33.0       | 17.5      | 1.70         |
| B22t    | 14.3                          | 43.7 | 42.0 | 43.1                 | 32.5       | 16.8      |              |
| Bca1    | 16.8                          | 47.2 | 36.0 | 38.5                 | 29.3       | 14.6      | 1.83         |
| Bca2    | 15.2                          | 48.1 | 36.7 | 38.3                 | 29.5       | 14.7      |              |
| B31     | 13.9                          | 48.2 | 37.9 | 38.7                 | 29.1       | 15.0      |              |
| B32     | 14.4                          | 47.6 | 38.0 | 39.4                 | 29.5       | 15.2      | 1.87         |
| C       | 15.5                          | 47.0 | 37.5 | 39.2                 | 29.2       | 14.7      |              |

**Appendix Table 5.—CAREY SILT LOAM NO. 1 (59-OK-20-1)**

|   |  |
|---|--|
| Location: 7 mi. N. of Arapaho,<br>Okla. 950 ft. N. and 1000<br>ft. E. of S.W. corner of<br>Sec. 13, T14N, R17W.<br>Custer County, Okla. | Relief: 3½%<br>Order: Mollisol<br>Subgroup: Typic Argiustoll<br>Family: fine-silty, mixed, thermic |
| Cultivated or Virgin: cultivated  |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth<br>(in.) | Color (D)  | Texture | Structure | Consistence |
|---------|----------------|------------|---------|-----------|-------------|
| A1p     | 0-7            | 5 YR 4/4   | 1       | 1fgr      | mvfr, ds    |
| B21     | 7-17           | 5 YR 4/4   | 1       | 2mfgr     | mfr, dsh    |
| B22     | 17-23          | 5 YR 4/4   | 1       | 2mgr      | mfr, dsh    |
| B3      | 23-30          | 2.5 YR 4/6 | 1       | 2-3fgr    | mfr, dh     |
| C1      | 30-40          | 2.5 YR 4/6 | 1       | -----     | mfr         |
| C-2     | 40-50          | 2.5 YR 4/6 | 1       | -----     | mfr         |
| Cca     | 50-57          | 2.5 YR 5/6 | 1       | -----     | mfr         |

**CHEMICAL DATA:**

| Horizon | pH with 1:1<br>soil-water<br>ratio | %<br>Organic<br>matter | %<br>N | C.E.C.<br>me/100g. | Exchangeable Cations<br>me/100gms. |     |     |      |     | Free<br>Iron<br>%<br>Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------------|------------------------|--------|--------------------|------------------------------------|-----|-----|------|-----|---|
|         |                                    |                        |        |                    | Ca                                 | Mg  | K   | Na   | H   |   |
| A1p     | 7.8                                | 1.1                    | .061   | 12.2               | 9.8                                | 3.4 | 0.4 | <0.1 | 1.0 | 1.1   |
| B21     | 7.9                                | 1.1                    | .062   | 14.4               | 10.2                               | 5.2 | 0.3 | 0.1  | 1.7 | 1.3   |
| B22     | 8.0                                | .7                     | .048   | 13.6               | 14.3                               | 4.7 | 0.3 | 0.1  | .7  | 1.2   |
| B3      | 8.1                                | .5                     | .035   | 12.4               |                                    |     | 0.3 | 0.1  |     | 1.2   |
| C-1     | 8.2                                | .2                     |        | 9.9                |                                    |     | 0.2 | <0.1 |     | 1.2   |
| C-2     | 8.3                                | .1                     |        | 8.8                |                                    |     | 0.2 | 0.1  |     | 1.2   |
| Cca     | 8.5                                | .1                     |        | 6.3                |                                    |     | 0.2 | 0.1  |     | 0.9   |

**PHYSICAL DATA:**

| Horizon | Particle<br>Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk<br>Density |
|---------|----------------------------------|------|------|----------------------|------------|-----------|-----------------|
|         | Sand                             | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |                 |
| A1p     | 41.8                             | 39.4 | 18.8 | 31.5                 | 18.1       | 7.1       |                 |
| B21     | 36.2                             | 40.9 | 22.9 | 34.5                 | 21.1       | 9.1       | 1.49            |
| B22     | 43.7                             | 33.6 | 22.7 | 31.9                 | 19.4       | 8.9       |                 |
| B3      | 47.5                             | 31.5 | 21.0 | 31.8                 | 19.6       | 8.4       | 1.63            |
| C-1     | 48.9                             | 34.2 | 16.9 | 30.4                 | 18.6       | 7.3       |                 |
| C-2     | 48.4                             | 36.6 | 15.0 | 28.6                 | 17.5       | 6.5       | 1.64            |
| Cca     | 41.9                             | 43.7 | 14.4 | 25.6                 | 17.9       | 5.7       |                 |

**Appendix Table 6.—CAREY SILT LOAM NO. 2 (59-OK-20-2)**

|   |   |
|---|---|
| Location: 2 mi. S. of Butler, Okla.<br>362 ft. S. and 137 ft. W.<br>of the N.E. corner of S.E.<br>¼ S.E. ¼ of Sec. 11,<br>T13N, R19N. Custer<br>County, Okla.<br>Cultivated or Virgin: cultivated | Relief: 3½ %<br>Order: Mollisol<br>Subgroup: Typic Argiustoll<br>Family: fine-silty, mixed, thermic |
|---|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture  | Structure | Consistence |
|---------|-------------|------------|----------|-----------|-------------|
| A1p     | 0-7         | 5 YR 4/2   | sil/1    | 1fgr      | mvfr, ds    |
| A12     | 7-13        | 5 YR 4/2   | sil      | 2fgr      | mvfr, ds    |
| B21     | 13-17       | 5 YR 4/3   | sil      | 2fgr      | mfr, dsh    |
| B22     | 17-25       | 5 YR 4/3   | 1/sil    | 2-3fgr    | mfr, dsh    |
| B31     | 25-34       | 10 YR 4/4  | sil      | 1fgr      | mfr, dsh    |
| B32     | 34-41       | 5 YR 4/4   | sic1/sil | 1fgr      | mfr, dsh    |
| Cca     | 41-48       | 2.5 YR 6/6 | sil      | 0         | mfr, dh     |
| C       | 48-58       | 2.5 YR 6/6 | sil      | 0         | msfi, dh    |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |     |     |      |     | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|-----|-----|------|-----|--|
|         |                              |                  |      |                 | Ca                              | Mg  | K   | Na   | H   |  |
| A1P     | 8.0                          | 1.6              | .080 | 14.1            | 17.4                            | 1.8 | 0.5 | <0.1 | 0.5 | 1.2  |
| A12     | 8.0                          | 1.4              | .072 | 15.1            | 14.1                            | 2.6 | 0.4 | <0.1 | 1.2 | 1.1  |
| B21     | 8.0                          | 1.3              | .071 | 15.3            | 14.0                            | 3.5 | 0.3 | <0.1 | 0.7 | 1.2  |
| B22     | 8.1                          | 1.0              | .061 | 13.4            |                                 |     | 0.3 | <0.1 |     | 1.1  |
| B31     | 8.2                          | .9               |      | 13.7            |                                 |     | 0.3 | 0.1  |     | 1.1  |
| B32     | 8.2                          | .7               |      | 16.4            |                                 |     | 0.3 | 0.1  |     | 1.3  |
| Cca     | 8.3                          | .5               |      | 9.5             |                                 |     | 0.2 | 0.1  |     | 1.1  |
| C       | 8.4                          | .2               |      | 7.4             |                                 |     | 0.2 | 0.1  |     | 1.1  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1p     | 31.4                          | 50.4 | 18.2 | 32.8                 | 20.1       | 7.5       |              |
| A12     | 28.8                          | 52.1 | 19.1 | 33.4                 | 18.5       | 7.9       | 1.35         |
| B21     | 28.2                          | 52.0 | 19.8 | 30.5                 | 18.2       | 8.2       |              |
| B22     | 28.7                          | 49.8 | 21.5 | 28.9                 | 18.8       | 8.5       | 1.32         |
| B31     | 25.3                          | 52.2 | 22.5 | 29.0                 | 19.9       | 9.0       |              |
| B32     | 19.0                          | 53.6 | 27.4 | 31.4                 | 22.3       | 10.8      | 1.39         |
| Cca     | 20.1                          | 56.1 | 23.8 | 30.5                 | 22.5       | 7.8       |              |
| C       | 20.3                          | 58.5 | 21.2 | 27.2                 | 20.8       | 6.5       |              |

**Appendix Table 7.—ST. PAUL SILT LOAM NO. 1 (59-OK-77-3)**

|   |   |
|---|---|
| Location: ¾ mi. N. and 1¼ mi. E. of Mutual, Okla. 1480 ft. W. and 1090 ft. N. of center of Sec. 5, T20N, R18W. Woodward County, Okla. | Cultivated or Virgin: cultivated<br>Relief: nearly level<br>Order: Mollisol<br>Subgroup: Typic Argiustoll<br>Family: fine-silty, mixed, thermic |
|---|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure  | Consistence |
|---------|-------------|------------|---------|------------|-------------|
| A1p     | 0-7         | 10 YR 5/2  | sil     | 1fgr       | mvfr, dsh   |
| A12     | 7-14        | 10 YR 4/2  | 1/sil   | 2fgr       | mvfr, dsh   |
| A13     | 14-20       | 7.5 YR 4/2 | 1       | 2fgr       | mfr, dh     |
| B1      | 20-28       | 7.5 YR 4/2 | 1       | 2mfg       | mfr, dh     |
| B21     | 28-34       | 7.5 YR 4/2 | cl      | 2mfsbk     | mfr, dh     |
| B22     | 34-46       | 7.5 YR 4/2 | cl      | 1cpr-2msbk | msfi, dsh   |
| B3      | 46-55       | 7.5 YR 4/2 | 1       | 1cpr       | mfr, dsh    |
| Cca     | 55-65       | 5 YR 4/4   | vfs     | 1cpr       | mfr, dsh    |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |     |     |      |      | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|-----|-----|------|------|--|
|         |                              |                  |      |                 | Ca                              | Mg  | K   | Na   | H    |  |
| A1p     | 6.2                          | 1.5              | .068 | 10.1            | 6.1                             | 2.5 | 1.0 | <0.1 | 2.8  | 0.7  |
| A12     | 6.6                          | 1.4              | .068 | 13.5            | 9.2                             | 3.9 | 0.8 | <0.1 | 2.6  | 0.9  |
| A13     | 7.0                          | 1.1              | .055 | 14.6            | 10.2                            | 4.3 | 0.6 | <0.1 | 1.7  | 0.9  |
| B1      | 7.3                          | .9               | .050 | 15.9            | 11.4                            | 5.2 | 0.6 | <0.1 | 1.9  | 0.9  |
| B21     | 7.5                          | .9               |      | 19.4            | 13.5                            | 6.7 | 0.9 | 0.1  | 2.2  | 1.0  |
| B22     | 7.5                          | .8               |      | 19.8            | 13.6                            | 7.2 | 0.9 | 0.1  | 1.7  | 1.0  |
| B3      | 7.9                          | .5               |      | 15.5            | 11.3                            | 6.2 | 0.6 | 0.1  | 1.0  | 0.7  |
| Cca     | 8.1                          | .3               |      | 11.3            | 15.9                            | 5.3 | 0.5 | 0.1  | <0.1 | 0.6  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1p     | 35.2                          | 51.3 | 13.5 | 30.6                 | 14.4       | 5.7       |              |
| A12     | 31.4                          | 49.8 | 18.8 | 35.3                 | 18.9       | 7.9       | 1.47         |
| A13     | 32.4                          | 46.7 | 20.9 | 35.1                 | 29.0       | 8.5       |              |
| B1      | 33.8                          | 43.2 | 23.0 | 32.5                 | 27.8       | 9.3       | 1.55         |
| B21     | 27.0                          | 42.4 | 30.6 | 35.7                 | 33.5       | 12.4      |              |
| B22     | 26.2                          | 43.9 | 29.9 | 34.1                 | 33.0       | 12.1      |              |
| B3      | 43.4                          | 35.2 | 21.4 | 30.3                 | 28.5       | 8.9       | 1.66         |
| Cca     | 61.8                          | 23.7 | 14.5 | 26.3                 | 23.1       | 6.6       |              |

**Appendix Table 8.—ST. PAUL SILT LOAM NO. 2 (59-OK-22-1)**

|   |   |
|---|---|
| Location: 2¼ mi. S.E. of Seiling,<br>Okla. 1700 ft. E. and 480<br>ft. S. of N.W. corner of<br>Sec. 15, T19N, R16W.<br>Dewey County, Okla. | Relief: 2%<br>Order: Mollisol<br>Subgroup: Typic Argiustoll<br>Family: fine-silty, mixed, thermic |
| Cultivated or Virgin: cultivated  |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D)  | Texture | Structure | Consistence |
|---------|-------------|------------|---------|-----------|-------------|
| A1p     | 0-7         | 10 YR 4/3  | sil     | 1fgr      | mvfr, ds    |
| A12     | 7-14        | 10 YR 4/2  | sil     | 2fgr      | mvfr, ds    |
| A13     | 14-20       | 10 YR 4/2  | sil     | 3fgr      | mvfr, ds    |
| B11     | 20-28       | 7.5 YR 4/2 | sil     | 1-2fgr    | mfr, dsh    |
| B12     | 28-36       | 7.5 YR 4/2 | sil     | 2fsbk     | msfi, dh    |
| B21     | 36-45       | 7.5 YR 4/2 | cl/sicl | 2mfsbk    | msfi, dh    |
| B22     | 45-50       | 5 YR 4/3   | cl      | fmabk     | mfi, dvh    |
| B3      | 50-58       | 5 YR 4/4   | cl      | 2-3mabk   | mfr, dh     |
| C       | 58-65       | 5 YR 5/6   | cl      | vlmfsbk   | mfr, dsh    |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. mc/100g. | Exchangeable Cations me/100gms. |     |     |      |      | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|-----|-----|------|------|--|
|         |                              |                  |      |                 | Ca                              | Mg  | K   | Na   | H    |  |
| A1p     | 6.3                          | 1.3              | .066 | 11.0            | 7.4                             | 2.6 | 0.9 | <0.1 | 3.1  | 0.9  |
| A12     | 6.8                          | 1.4              | .072 | 14.5            | 10.9                            | 3.4 | 0.5 | <0.1 | 2.6  | 1.0  |
| A13     | 7.2                          | 1.2              | .065 | 16.0            | 12.0                            | 4.0 | 0.5 | 0.1  | 2.2  | 1.0  |
| B11     | 7.2                          | .9               | .052 | 16.7            | 12.3                            | 4.4 | 0.5 | 0.1  | 2.2  | 1.1  |
| B12     | 7.3                          | .8               |      | 16.9            | 12.4                            | 4.8 | 0.4 | 0.1  | 1.7  | 1.1  |
| B21     | 7.4                          | .8               |      | 20.7            | 14.8                            | 6.3 | 0.5 | 0.2  | 1.9  | 1.2  |
| B22     | 7.3                          | .7               |      | 23.8            | 17.5                            | 7.6 | 0.6 | 0.2  | 2.0  | 1.3  |
| B3      | 7.9                          | .4               |      | 19.5            | 21.2                            | 6.7 | 0.6 | 0.1  | 0.7  | 1.3  |
| C       | 8.1                          | .4               |      | 16.4            | 20.7                            | 6.1 | 0.5 | 0.1  | <0.1 | 1.2  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1p     | 31.0                          | 54.3 | 14.7 | 30.3                 | 13.8       | 6.3       |              |
| A12     | 25.0                          | 54.6 | 20.4 | 33.7                 | 17.2       | 8.5       |              |
| A13     | 24.7                          | 53.0 | 22.3 | 34.7                 | 18.5       | 9.3       | 1.43         |
| B11     | 23.6                          | 52.6 | 23.8 | 33.9                 | 20.0       | 10.2      |              |
| B12     | 24.0                          | 51.6 | 24.4 | 30.8                 | 18.3       | 9.7       |              |
| B21     | 20.1                          | 48.8 | 31.1 | 33.1                 | 22.7       | 12.5      | 1.70         |
| B22     | 21.4                          | 41.2 | 37.4 | 36.0                 | 25.4       | 15.0      |              |
| B3      | 29.6                          | 39.0 | 31.4 | 34.1                 | 22.8       | 12.8      |              |
| C       | 34.8                          | 37.4 | 27.8 | 33.9                 | 20.2       | 11.3      |              |

**Appendix Table 9.—COBB FINE SANDY LOAM**

|  |                                   |
|--|-----------------------------------|
| Location: Caddo Peanut Research Station, 95 ft. E. of N.C. range pole. | Relief: convex 2% slopes          |
| Virgin or cultivated: old field (grass)                                | Order: Alfisol                    |
|  | Subgroup: Typic Haplustalf        |
|  | Family: fine loamy, mixed thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color      | Texture | Structure | Consistence |
|---------|-------|------------|---------|-----------|-------------|
| Ap      | 0-9   | 2 YR 3/4   | fsl     | lcgr      | mfr         |
| B21t    | 9-18  | 2.5 YR 3/6 | fsl     | lcgr      | mfr         |
| B22t    | 18-26 | 2.5 YR 3/6 | scl     | lcpr      | mfr         |
| B31     | 26-41 | 2.5 YR 4/6 | scl     | lcpr      | mfr         |
| B32     | 41-56 | 2.5 YR 4/6 | fsl     | lcpr      | mfr         |
| C1      | 56-77 | 2.5 YR 4/6 | s       | m         | cw; dh      |
| IIC2    | 77-90 | 2.5 YR 5/6 | ls      | m         | cw; dh      |
| IIC3    | 90+   | 2.5 YR 4/6 | s       | m         | cw; dh      |

**CHEMICAL DATA:**

| Horizon | ph  |     | % organic matter | % N | CEC Me/100g. | Exchangeable cations Me/100g. |     |     |     | % Base Sat | Bray Phos. #/ac |
|---------|-----|-----|------------------|-----|--------------|-------------------------------|-----|-----|-----|------------|-----------------|
|         | *   | **  |                  |     |              | Ca                            | Mg  | K   | Na  |            |                 |
| Ap      | 6.8 | 5.7 | 1.0              | .06 | 10.3         | 4.7                           | 1.7 | .59 | .13 | 69         | 22.6            |
| B21t    | 6.4 | 5.0 | .6               | .04 | 9.9          | 5.3                           | 3.4 | .28 | .13 | 92         | 3.8             |
| B22t    | 6.4 | 5.0 | .4               | .04 | 9.6          | 6.1                           | 3.5 | .23 | .09 | 103        | 3.8             |
| B31     | 6.5 | 5.1 | .3               | .01 | 8.3          | 4.7                           | 3.3 | .21 | .09 | 100        | 3.8             |
| B32     | 6.7 | 5.3 | .1               | .02 | 6.9          | 4.3                           | 2.3 | .23 | .09 | 100        | 3.8             |
| C1      | 6.9 | 5.6 | .0               | .01 | 4.6          | 2.0                           | 1.5 | .10 | .13 | 81         | 3.8             |
| IIC2    | 7.0 | 5.6 | .0               | .01 | 5.1          | 2.9                           | 1.6 | .18 | .04 | 93         | 3.8             |
| IIC3    | 6.9 | 5.5 | .0               | .02 | 4.4          | 2.2                           | 1.8 | .18 | .13 | 98         | 3.8             |

\* 1:1 Soil: water ratio

\*\* KC1 Method

**PHYSICAL DATA:**

| Horizon | Sand | Silt | Clay | V.F.S. | Textural Class  |
|---------|------|------|------|--------|-----------------|
| Ap      | 76.7 | 11.8 | 11.5 | 25.5   | sandy loam      |
| B21t    | 68.3 | 8.8  | 22.9 | 25.6   | sandy clay loam |
| B22t    | 69.6 | 10.2 | 20.2 | 34.2   | sandy clay loam |
| B31     | 74.3 | 9.0  | 16.7 | 10.7   | sandy loam      |
| B32     | 80.0 | 6.3  | 13.7 | 16.9   | sandy loam      |
| C1      | 90.0 | 7.1  | 2.9  | 35.9   | sand            |
| IIC2    | 83.6 | 9.0  | 7.4  | 1.2    | loamy sand      |
| IIC3    | 91.1 | 4.1  | 4.8  | 37.3   | sand            |

**Appendix Table 10.—NASH-LIKE FINE SANDY LOAM**

Location: 2300 ft. N. and 200 ft. E. of S.W. corner Sec. 33 T 11 N. R. 23 W. about 5 mi. N. of Sayre  
 Order: Mollisol  
 Subgroup: Udic Haplustoll  
 Family: Coarse loamy; mixed, thermic  
 Virgin or Cultivated: Cultivated  
 Relief: convex slopes

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence    |
|---------|-------|----------------|---------|-----------|----------------|
| Ap      | 0-6   | 5 YR 5/3;3/3   | fsl     | lfgr      | mwfr           |
| A12     | 0-13  | 5 YR 4/3;3/3   | fsl     | lfgr      | mwfr           |
| B21     | 13-26 | 2.5 YR 4/4;3/4 | fsl     | lmpr      | mfr            |
| B22     | 26-44 | 2.5 YR 4/4;3/4 | fsl     | lcpr      | mfr/dh         |
| R       | 44-60 | 2.5 YR 5/6;4/6 |         | m         | w. Fe-Cemented |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 73.4                          | 13.9 | 12.7 | 47.4 | 1.3    | sandy loam       |                |
| A12     | 74.5                          | 12.7 | 12.7 | 44.7 | 1.2    | sandy loam       |                |
| B21     | 70.7                          | 14.0 | 15.3 | 46.8 | 1.0    | sandy loam       |                |
| B22     | 67.9                          | 15.4 | 16.7 | 49.6 |        | sandy loam       |                |
| R       | 72.7                          | 16.9 | 19.4 | 69.5 |        | sandy loam       |                |

**Appendix Table 11.—DILL-LIKE LOAMY FINE SAND**

Location: 1400 ft. S. and 600 ft. W. of N.E. corner Sec. 33 T 11 N.R. 21 W; about 1 mi. S. and 1 mi. W. of Elk City  
 Order: Inceptisol  
 Subgroup: Typic Ustochrept  
 Family: Coarse loamy, mixed, thermic  
 Virgin or Cultivated: Cultivated  
 Relief: convex slopes

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-10  | 2.5 YR 4/4;3/4 | fsl     | lfgr      | mvfr; dsh   |
| B2      | 10-26 | 2.5 YR 4/5;3/5 | fsl     | lcpr      | mvfr; dh    |
| B22     | 26-35 | 2.5 YR 4/6;3/6 | fsl     | lcpr      | mvfr; dh    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 82.3                          | 7.6  | 10.1 | 30.2 | 0.8    | loamy sand       |                |
| B2      | 83.5                          | 3.8  | 12.7 | 39.2 | 0.6    | loamy sand       |                |
| B22     | 84.0                          | 5.3  | 10.7 | 49.8 |        | loamy sand       |                |
| R       | 85.3                          | 10.7 | 4.0  |      |        | loamy sand       |                |

**Appendix Table 12.—LUCIEN VERY FINE SANDY LOAM**

|   |  |
|---|--|
| Location: 1600 ft. E. and 275 ft. S.<br>of N.W. corner of Sec.<br>24 T 8 N, R 14 W. | Order: Mollisol<br>Subgroup: Typic Haplustoll<br>Family: Loamy, mixed,<br>thermic, shallow |
| Cultivated or Virgin: Virgin  |  |
| Relief: convex slopes   |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| A1      | 0-10   | 5 YR 5/3;3/3   | fsl     | lfgr      | mvfr; dsh   |
| B2      | 10-19  | 2.5 YR 4/4;3/4 | fsl     | 2mgr      | mfr; dsh    |
| R       | 19-28+ | 2.5 YR 6/6;5/6 |         |           | cs          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A1      | 68.6                          | 21.2 | 10.3 | 30.7   | 1.6              | sandy loam     |

**Appendix Table 13.—LUCIEN VERY FINE SANDY LOAM**

|   |   |
|---|---|
| Location: 2150 ft. E. and 125 ft. N.<br>of S.E. corner of Sec. 35<br>T 10 N R 14 W—4 mi. S<br>and 1.5 mi. E of Colony | Order: Mollisol<br>Subgroup: Typic Haplustoll<br>Family: loamy, mixed<br>thermic, shallow |
| Virgin or Cultivated: Virgin  |   |
| Relief: convex slopes   |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| A1      | 0-6    | 5 YR 5/4;3/4   | fsl     | lfgr      | mvfr; dsh   |
| B2      | 6-18   | 2.5 YR 4/6;3/6 | fsl     | 2mgr      | mfr; dsh    |
| R       | 18-22+ | 2.5 YR 5/6;4/6 |         |           | cs          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A1      | 69.0                          | 20.7 | 10.3 | 44.8   | 1.3              | sandy loam     |



**Appendix Table 14.—DILL VERY FINE SANDY LOAM**

|  |  |
|--|--|
| Location: 4150 ft. W. and 100 ft. S.<br>of N.E. corner of Sec. 21<br>T 11 N R 19 W. about<br>4 mi. N. and 2.8 mi. W.<br>of Burns Flat<br>Virgin or Cultivated: Cultivated<br>Relief: Convex slopes | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: Coarse-loamy, mixed,<br>thermic |
|--|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-8    | 5 YR 4/4;3/4   | fsl     | lmgr      | mfr; dsh    |
| B21     | 8-24   | 2.5 YR 4/6;3/6 | fsl     | lcpr      | mfr; dsh    |
| B22     | 24-34  | 2.5 YR 4/6;3/6 | fsl     | lfgr      | mfr; dsh    |
| R       | 34-38+ | 2.5 YR 4/6;3/6 | pack's  |           | cw          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 65.7                          | 19.1 | 15.2 | 43.8   | 0.8              | sandy loam     |

**Appendix Table 15.—DILL FINE SANDY LOAM**

|   |   |
|---|---|
| Location: 2200 ft. W. and 100 ft.<br>S. of N.E. corner of Sec.<br>12 T 11 N R 20 W; about<br>2 mi. N. and six E. of<br>Canute.<br>Virgin or Cultivated: Cultivated<br>Relief: convex slopes | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: Coarse, loamy, mixed,<br>thermic |
|---|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-8   | 2.5 YR 4/4;3/4 | fsl     | lmgr      | mfr; dsh    |
| B2      | 8-28  | 2.5 YR 4/6;3/6 | fsl     | lcpr      | mfr; dsh    |
| R       | 28-36 | 2.5 YR 4/6;3/6 | pack's  |           | cw          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 69.3                          | 17.9 | 12.8 |        | 0.6              | sandy loam     |

**Appendix Table 16.—QUINLAN VERY FINE SANDY LOAM**

|  |   |
|--|---|
| Location: 600 ft. E. and 60 ft. S. of<br>the N.W. corner of Sec. 35<br>T 7 N R 12 W. | Relief: Sloping—6%<br>Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: loamy, mixed, thermic, |
| Virgin or Cultivated: Virgin   |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture   | Structure | Consistence |
|---------|-------|----------------|-----------|-----------|-------------|
| A       | 0-8   | 5 YR 4/3;3/3   | fsl       | lvfgr     | mvfr; ds    |
| B       | 8-14  | 5 YR 5/4;3/4   | fsl       | lvfgr     | mfr; dh     |
| R       | 14+   | 2.5 YR 6/6;4/6 | sandstone | m         | cw          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A       | 79.9                          | 13.8 | 6.3  | 42.7   | 0.9              | loamy sand     |
| B       | 72.2                          | 17.7 | 10.1 | 43.2   | 1.0              | sandy loam     |
| R       | 72.1                          | 21.6 | 6.3  | 53.9   | 0.5              | sandy loam     |

**Appendix Table 17.—DARNELL-LIKE LOAMY FINE SAND**

|  |  |
|--|--|
| Location: 500 ft. N. and 50 ft. W.<br>of the S.W. corner of Sec.<br>15, T 7 N, R 12 W. | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: Coarse-loamy, siliceous,<br>shallow |
| Virgin or Cultivated: Virgin   |  |
| Relief: Sloping—10%  |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture   | Structure | Consistence |
|---------|-------|----------------|-----------|-----------|-------------|
| A       | 0-8   | 5 YR 4/3;3/3   | fsl       | lfgr      | mvfr; ds    |
| B       | 8-17  | 5 YR 4/4;3/4   | fsl       | 2mgr      | mfr; dh     |
| C       | 17+   | 2.5 YR 5/6;3/6 | sandstone | m         | cw          |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A       | 86.5                          | 8.7  | 4.8  | 28.0   | 0.9              | loamy sand     |
| B       | 86.2                          | 8.8  | 5.0  | 25.8   | 1.0              | loamy sand     |
| C       | 79.8                          | 12.6 | 7.6  | 37.7   | 0.6              | loamy sand     |

**Appendix Table 18.—PORT-LIKE SILT LOAM**

|  |  |
|--|--|
| <p>Location: 1300 ft. S. and 900 ft. E. of the N.W. corner of Sec. 3, T 10 N, R 17 W, one mi. S., then one mile W., then 1/2 mile S. of Bessie Lutheran Church</p> | <p>Virgin or Cultivated: Cultivated<br/>Relief: level<br/>Order: Mollisol<br/>Subgroup: Cumulic Haplustoll<br/>Family: fine-silty, mixed thermic</p> |
|--|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-8    | 5 YR 4/3;3/3   | sil     | lmgr      | mfr; dsh    |
| A12     | 8-14   | 5 YR 4/3;3/3   | sil     | lmgr      | mfr; dsh    |
| B21     | 14-24  | 2.5 YR 4/4;3/4 | cl      | lfgr      | mfi; dh     |
| B22     | 24-48  | 2.5 YR 4/6;3/6 | cl      | lfgr      | mfi; dh     |
| B23     | 48-52  | 2.5 YR 4/4;3/4 | sic     | 2fgr      | mfi; dh     |
| Cl      | 52-68+ | 2.5 YR 4/6;3/6 | cl      | m         | mfi; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |     | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|-----|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |     |        |                  |                |
| Ap      | 10.4                          | 63.3 | 26.3 | 8.1 | 2.7    | silt loam        |                |
| A12     | 12.2                          | 61.6 | 26.2 | 7.5 | 1.9    | silt loam        |                |

**Appendix Table 19.—PORT-LIKE SILT LOAM**

|   |  |
|---|--|
| <p>Location: From N.E. corner of Sec. 16 T 9 N, R 17 W, 1050 ft. W. down U.S. Hwy 183, 1700 ft. S.W. and 75 ft. E., 2.5 mi. S. of Cordell on U.S. Hwy. 183.</p> | <p>Virgin or Cultivated: Cultivated<br/>Relief: level<br/>Order: Mollisol<br/>Subgroup: Cumulic Haplustoll<br/>Family: fine-silty, mixed thermic</p> |
|---|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color        | Texture | Structure | Consistence |
|---------|--------|--------------|---------|-----------|-------------|
| Ap      | 0-8    | 5 YR 4/3;3/3 | sil     | lfgr      | mfr; dsh    |
| A12     | 8-16   | 5 YR 4/3;3/3 | sil     | lfgr      | mfr; dsh    |
| B2      | 16-22  | 5 YR 4/3;3/3 | sil     | 2mgr      |             |
| C       | 22-62+ | 5 YR 4/4;3/4 | cl      | m         |             |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |     | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|-----|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |     |        |                  |                |
| Ap      | 11.5                          | 62.5 | 26.0 | 8.8 | 1.9    | silt loam        |                |
| A12     | 7.5                           | 63.4 | 29.1 | 4.8 | 1.9    | silty clay loam  |                |

**Appendix Table 20.—PORT-LIKE SILT LOAM**

|           |  |   |
|-----------|--|---|
| Location: | 1560 ft. E. and 30 ft. N of the S.W. corner of Sec. 31, T 13 N, R 16 W; 2 mi. N. and 1¼ mi. E. of Clinton. | Virgin or Cultivated: Cultivated<br>Relief: nearly level<br>Order: Mollisol<br>Subgroup: Cumulic Haplustoll<br>Family: fine-silty, mixed, thermic |
|-----------|--|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color        | Texture | Structure | Consistence |
|---------|-------|--------------|---------|-----------|-------------|
| Ap      | 0-8   | 5 YR 4/3;3/3 | sil     | lfgr      | mfr; dsh    |
| A12     | 8-18  | 5 YR 4/3;3/3 | sil     | 2fgr      | mfr; dsh    |
| A/c     | 18-26 | 5 YR 4/2;3/2 | sil     | 2fgr      | mfr; dsh    |
| C       | 26-66 | 5 YR 4/3;3/3 | sil     | lfgr      | mfr; dsh    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 28.5                          | 52.4 | 19.1 | 27.8   | 2.0              | silt loam      |
| A12     | 24.4                          | 52.5 | 23.1 | 21.1   | 1.7              | silt loam      |

**Appendix Table 21.—PORT-LIKE LOAM**

|           |   |   |
|-----------|---|---|
| Location: | 660 ft. E. and 90 ft. S. of the N.W. corner of Sec. 1, T 13 N. R 18 W, 6 mi. E. of Butler on Hwy. 33. | Virgin or Cultivated: Cultivated<br>Relief: nearly level<br>Order: Mollisol<br>Subgroup: Cumulic Haplustoll<br>Family: fine-silty; mixed, thermic |
|-----------|---|---|

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color        | Texture | Structure | Consistence |
|---------|-------|--------------|---------|-----------|-------------|
| Ap      | 0-8   | 7 YR 4/3;3/2 | sil     | lfgr      | mfr; dsh    |
| A/c     | 8-40  | 5 YR 4/3;3/3 | l       | 2fgr      | mfr; dsh    |
| C       | 40-66 | 5 YR 4/3;3/3 | l       | lfgr      | mfr; dsh    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 32.1                          | 47.4 | 20.5 | 30.0   | 1.8              | loam           |
| A/c     | 30.8                          | 48.7 | 20.5 | 29.6   | 1.7              | loam           |

**Appendix Table 22.—CYRIL VERY FINE SANDY LOAM**

|   |   |
|---|---|
| Location: 1120 ft. W. and 90 ft. S.<br>of the N.E. corner of Sec.<br>29, T 7 N, R 12 W. | Order: Mollisol                         |
| Virgin or Cultivated: Virgin  | Subgroup: Fluventic Haplustoll          |
| Relief: nearly level  | Family: Coarse-loamy, mixed,<br>thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| A1      | 0-12  | 10 YR 4/2;2/2  | fsl     | 2mfgr     | mvfr; dsh   |
| B       | 12-34 | 10 YR 5/1;3/1  | l       | lfgr      | mvfr; dsh   |
| C1      | 34-48 | 10 YR 6/2;4/2  | l       | lfgr      | mfr; dh     |
| C2      | 48-60 | 7.5 YR 6/4;5/4 | l       | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A1      | 63.4                          | 24.0 | 12.6 | 41.3   | 2.2              | sandy loam     |

**Appendix Table 23.—CYRIL FINE SANDY LOAM**

|  |   |
|--|---|
| Location: 200 ft. W. of the N.E.<br>corner of Sec. 36, T 5 N,<br>R 10 W. | Order: Mollisol                         |
| Virgin or Cultivated: Cultivated   | Subgroup: Fluventic Haplustoll          |
| Relief: nearly level   | Family: coarse-loamy, mixed,<br>thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color         | Texture | Structure | Consistence |
|---------|-------|---------------|---------|-----------|-------------|
| Ap      | 0-10  | 10 YR 4/1;3/1 | fsl     | lvfgr     | mvfr; dh    |
| B       | 10-32 | 10 YR 4/2;3/2 | fsl     | lfgr      | mfr; dh     |
| C       | 32-62 | 10 YR 4/1;3/1 | l       | lvfgr     |             |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 50.6                          | 34.2 | 15.2 | 22.9   | 1.7              | loam           |

**Appendix Table 24.—ZAVALA-LIKE VERY FINE SANDY LOAM**

|   |  |
|---|--|
| Location: 1300 ft. W. of the S.E.<br>corner of Sec. 33, T 14 N,<br>R 9 W. | Order: Entisol   |
| Virgin or Cultivated: Cultivated  | Subgroup: Typic Ustifluent                               |
| Relief: nearly level  | Family: Coarse-loamy, mixed, non-<br>acid, hyper-thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color         | Texture | Structure | Consistence |
|---------|-------|---------------|---------|-----------|-------------|
| Ap      | 0-6   | 10 YR 4/3     | fsl     | lfgr      | mvfr; ds    |
| A12     | 6-12  | 10 YR 4/3;3/4 | fsl     | lfgr      | mvfr; ds    |
| B2      | 12-22 | 10 YR 5/3;4/3 | fsl     | 2fgr      | mvfr; ds    |
| C       | 22-48 | 10 YR 6/3;5/4 | vfs     | 0         | ml; dl      |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |  | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |  |        |                  |                |
| Ap      | 67.2                          | 22.7 | 10.1 |  |        | 0.9              | sandy loam     |
| A12     | 69.8                          | 22.7 | 7.5  |  | 42.5   | 0.8              | sandy loam     |
| B2      | 64.7                          | 25.2 | 10.1 |  | 45.0   | 0.8              | sandy loam     |
| C       | 67.4                          | 27.6 | 5.0  |  | 58.2   |                  | sandy loam     |

**Appendix Table 25.—YAHOLA FINE SANDY LOAM**

|   |   |
|---|---|
| Location: 50 ft. W. and 1000 ft. N.<br>of S.W. corner of Sec. 13<br>T 6 S, R 9 W. | Order: Entisol  |
| Virgin or Cultivated: Virgin  | Subgroup: Typic Ustifluent                            |
| Relief: nearly level  | Family: Coarse-loamy, mixed, cal-<br>careous, thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color        | Texture | Structure | Consistence |
|---------|-------|--------------|---------|-----------|-------------|
| A1      | 0-20  | 5 YR 6/4;4/4 | lfs     | 0         | mwfr; ds    |
| C       | 20-72 | 5 YR 6/6;5/6 | fsl     | 0         | mwfr; ds    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |  | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |  |        |                  |                |
| A1      | 63.4                          | 29.0 | 7.6  |  | 59.8   |                  | sandy loam     |
| C       | 43.0                          | 48.7 | 8.3  |  | 38.3   |                  | loam           |

**Appendix Table 26.—CANADIAN-LIKE FINE SANDY LOAM**

|   |                                      |
|---|--------------------------------------|
| Location: 1100 ft. E. and 50 ft. N. of S.W. corner of Sec. 3, T 8 N, R 3 W. | Order: Mollisol                      |
| Virgin or Cultivated: Cultivated  | Subgroup: Udic Haplustoll            |
| Relief: nearly level  | Family: coarse-loamy, mixed, thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-8    | 7.5 YR 5/4;3/4 | fsl     | lfgr      | mwfr; dsh   |
| A12     | 8-12   | 7.5 YR 5/4;3/4 | fsl     | lfgr      | mwfr; dsh   |
| C1      | 12-39  | 7.5 YR 6/4;5/4 | fsl     | m         | mwfr; dsh   |
| C2      | 39-80+ | 7.5 YR 6/4;4/4 | vfsl    | m         | mwfr; dh    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 61.0                          | 30.2 | 8.8  | 28.1   | 1.3              | sandy loam     |
| A12     | 55.9                          | 35.3 | 8.8  | 30.4   | 0.6              | sandy loam     |
| C1      | 50.2                          | 41.1 | 8.7  | 35.3   | 0.4              | loam           |
| C2      | 25.1                          | 59.7 | 15.2 | 23.2   |                  | silt loam      |

**Appendix Table 27.—REINACH SILT LOAM**

|  |                                      |
|--|--------------------------------------|
| Location: 50 ft. W. and 20 ft. N. of S.E. corner of N.E. 1/4 Sec. 33 T 8 N, R 8 W. | Relief: nearly level                 |
| Virgin or Cultivated: Cultivated   | Order: Mollisol                      |
|  | Subgroup: Pachic Haplustoll          |
|  | Family: coarse-silty, mixed, thermic |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure   | Consistence |
|---------|-------|----------------|---------|-------------|-------------|
| Ap      | 0-10  | 5 YR 4/3;3/3   | sil     | 2mfgr       | mfr; dsh    |
| A12     | 0-16  | 2.5 YR 4/4;3/4 | sil     | 2/3mfgr     | mfr; dsh    |
| B2      | 16-30 | 2.5 YR 4/4;3/4 | sil     | 2msbk/smfgr | mfr; dsh    |
| C1      | 30-49 | 2.5 YR 5/6;4/6 | sil     | m           | mfr; ds     |
| C2      | 49-58 | 2.5 YR 6/6;5/6 | sil     | m           | mfr; ds     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 32.0                          | 52.9 | 15.1 | 24.0   | 1.6              | silt loam      |
| A12     | 33.1                          | 48.0 | 18.9 | 27.4   | 1.3              | loam           |
| B2      | 39.4                          | 43.0 | 17.6 | 27.1   | 1.1              | loam           |
| C1      | 34.4                          | 45.4 | 20.2 | 26.5   |                  | loam           |
| C2      | 33.2                          | 50.4 | 16.4 | 28.3   |                  | silt loam      |

**Appendix Table 28.—REINACH SILT LOAM**

|   |   |
|---|---|
| Location: 440 ft. E. and 100 ft. N.<br>of S.W. corner of S.E. ¼<br>Sec. 6 T 7 N, R 8 W. | Relief: nearly level<br>Order: Mollisol<br>Subgroup: Pachic Haplustoll<br>Family: Coarse-silty, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated  |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure  | Consistence |
|---------|-------|----------------|---------|------------|-------------|
| Ap      | 0-9   | 5 YR 4/3;3/2   | sil     | 2fgr       | mwfr; dsh   |
| A12     | 9-13  | 5 YR 4/3;3/2   | sil     | 2fgr       | mfr; dsh    |
| B1      | 13-21 | 2.5 YR 4/4;2/4 | sil     | 2sbk/sfgr  | mfr; dsh    |
| B2      | 21-31 | 2.5 YR 4/4;3/3 | sil     | 2msbk/sfgr | mfr; dsh    |
| C1      | 31-42 | 2.5 YR 4/4;3/4 | sil     | m          | mfr; dsh    |
| C2      | 42-50 | 2.5 YR 5/6;4/6 | sil     | m          |             |
| C3      | 50-60 | 2.5 YR 6/6;5/6 | sil     | m          |             |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 29.3                          | 58.1 | 12.7 | 25.6 | 1.7    | silt loam        |                |
| A12     | 38.1                          | 41.7 | 20.2 | 31.1 | 1.4    | loam             |                |
| B1      | 58.2                          | 30.4 | 11.4 | 42.8 | 1.3    | silt loam        |                |
| B2      | 39.2                          | 48.1 | 18.7 | 24.9 |        | loam             |                |
| C1      | 35.6                          | 46.7 | 17.7 | 28.0 |        | loam             |                |
| C2      | 37.4                          | 47.4 | 15.2 | 33.9 |        | loam             |                |
| C3      | 26.4                          | 52.8 | 18.8 | 21.4 |        | silt loam        |                |

**Appendix Table 29.—CANADIAN-LIKE SILT LOAM**

|  |   |
|--|---|
| Location: 250 ft. W. and 100 ft. N.<br>of the S.E. corner of N.E.<br>¼ of S.W. ¼ Sec. 32, T<br>8 N, R 2 W. | Relief: nearly level<br>Order: Mollisol<br>Subgroup: Udic Haplustoll<br>Family: coarse-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated   |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-8   | 7.5 YR 5/4;3/4 | fsl     | 2fmgr     | mvfr; dsh   |
| A12     | 8-12  | 7.5 YR 5/4;3/3 | fsl     | 2fmgr     | mfr; dh     |
| C1      | 12-27 | 5 YR 5/4;4/4   | fsl     | m         | mfr; dh     |
| C2      | 27-48 | 5 YR 5/6;4/6   | l       | m         | mfr; dh     |
| C3      | 48-72 | 5 YR 5/6;3/6   | vfs     | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 31.5                          | 52.0 | 16.5 | 26.0 | 1.4    | silt loam        |                |
| A12     | 32.3                          | 51.4 | 16.3 | 26.2 | 1.4    | silt loam        |                |
| C1      | 34.1                          | 49.4 | 16.5 | 30.9 | 0.7    | loam             |                |
| C2      | 29.1                          | 54.5 | 16.4 | 26.0 |        | silt loam        |                |
| C3      | 27.9                          | 55.7 | 16.4 | 28.5 |        | silt loam        |                |



**Appendix Table 30.—HARDEMAN FINE SANDY LOAM**

|   |   |
|---|---|
| Location: 600 ft. N. and 225 ft. E.<br>of W. quarter corner Sec.<br>14 T 3 S, R 19 W. | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: coarse-loamy, mixed<br>thermic |
| Virgin or Cultivated: Cultivated  |   |
| Relief: nearly level  |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-7    | 10 YR 5/3;3/3  | fsl     | lfgr      | mvfr        |
| A12     | 7-12   | 10 YR 5/2;3/2  | fsl     | m         | mvfr        |
| B       | 12-36+ | 7.5 YR 6/4;5/4 | fsl     | m         | mvfr        |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 65.8                          | 22.8 | 11.4 | 26.2   | 0.6              | sandy loam     |
| A12     | 69.7                          | 20.2 | 10.1 | 34.2   | 0.6              | sandy loam     |

**Appendix Table 31.—HARDEMAN FINE SANDY LOAM**

|   |  |
|---|--|
| Location: 200 yards S.E. of the N.W.<br>corner of Sec. 35 T 3 S,<br>R 19 W. | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: coarse-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated  |  |
| Relief: nearly level  |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-7    | 7.5 YR 5/3;3/3 | fsl     | lfgr      | mvfr        |
| A12     | 7-18   | 7.5 YR 5/3;3/3 | fsl     | lfgr      | mvfr        |
| B       | 18-36  | 7.5 YR 5/4;4/4 | fsl     | m         | mvfr        |
| C       | 36-40+ | 7.5 YR 5/4;4/4 | fsl     | m         | mvfr        |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 57.0                          | 32.9 | 10.1 | 50.3   | 0.7              | sandy loam     |
| A12     | 54.4                          | 32.9 | 12.7 | 41.6   | 0.7              | sandy loam     |

**Appendix Table 32.—MINCO LOAM**

|  |   |
|--|---|
| Location: 1650 ft. E. and 200 ft. S.<br>of N.W. corner Sec. 20<br>T 6 S, R 8 W, 9 mi. S.<br>Waurika. | Relief: level, 0-1%<br>Order: Mollisol<br>Subgroup: Udic Haplustoll<br>Family: coarse-silty, mixed<br>thermic |
| Virgin or Cultivated: Cultivated   |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-9   | 7.5 YR 5/2;3/2 | 1       | 2mgr      | mfr; dsh    |
| A12     | 9-20  | 7.5 YR 4/2;3/2 | sil     | 1mgr      | mfr; dh     |
| B       | 20-35 | 5 YR 4/4;3/4   | sil     | 0         | mfr; dsh    |
| C1      | 35-55 | 5 YR 5/4;4/4   | sil     | lfgr      | mfr; dh     |
| IIC2    | 55-72 | 10 YR 6/3;5/3  | sicl    | lmgr/m    | mfi; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 43.9                          | 43.4 | 12.7 | 39.0 |        |                  | loam           |

**Appendix Table 33.—BASTROP LOAM**

|   |  |
|---|--|
| Location: 100 ft. W. and 400 ft. S.<br>of N.E. corner Sec. 6 T 6<br>S, R 8 W. | Order: Alfisol<br>Subgroup: Udic Paleustalf<br>Family: fine-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated  |  |
| Relief: gentle slopes, 1-3%   |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color          | Texture | Structure | Consistence |
|---------|--------|----------------|---------|-----------|-------------|
| Ap      | 0-7    | 7.5 YR 4/2;3/2 | 1       | 1mgr      | mfr; dsh    |
| A12     | 7-12   | 5 YR 4/4;3/4   | 1       | 2mgr      | mfr; dh     |
| B2t     | 12-33  | 5 YR 4/4;3/4   | cl      | 2mgr      | mfr; dh     |
| B3      | 33-44  | 25 YR 4/4;3/4  | cl      | m         | mfr; dh     |
| C       | 44-72+ | 2.5 YR 4/6;3/6 | cl      | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 50.9                          | 35.3 | 13.8 | 20.1 | 0.8    | loam             |                |
| A12     | 37.9                          | 40.6 | 21.5 | 16.8 | 1.1    | loam             |                |

**Appendix Table 34.—BASTROP LOAM**

|   |  |
|---|--|
| Location: 50 ft. W. and 350 ft. S.<br>of N.E. corner Sec. 19 T<br>6 S, R 7 W. | Order: Alfisol<br>Subgroup: Udic Paleustalf<br>Family: Fine-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated  |  |
| Relief: gentle slopes, 1-3%   |  |

**PROFILE DESCRIPTION:**

| Horizon | Depth  | Color         | Texture | Structure | Consistence |
|---------|--------|---------------|---------|-----------|-------------|
| Ap      | 0-5    | 5 YR 5/4;3/4  | 1       | 1mgr      | mfr; dh     |
| A12     | 5-11   | 5 YR 4/4;3/4  | 1       | 2mgr      | mfr; duh    |
| B2t     | 11-31  | 5 YR 5/4;4/4  | cl      | 2mgr      | mfr; dh     |
| B3      | 31-43  | 25 YR 4/4;3/4 | cl      | 1mgr      | mfr; dh     |
| C       | 43-65+ | 25 YR 4/6;3/6 | cl      | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 35.4                          | 45.6 | 19.0 | 16.9 | 1.2    | loam             |                |
| A12     | 34.3                          | 45.6 | 20.2 | 15.8 | 1.2    | loam             |                |

**Appendix Table 35.—TELLER-LIKE SILT LOAM**

|  |   |
|--|---|
| Location: 1500 ft. N. and 850 ft.<br>E. of S.W. corner Sec. 2<br>T 5 S, R 8 W. | Order: Mollisol<br>Subgroup: Udic Argiustoll<br>Family: fine-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated   |   |
| Relief: gentle slopes, 1-3%  |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-7   | 7.5 YR 5/2;3/2 | fsl     | 1mgr      | mvfr; dsh   |
| A12     | 7-12  | 7.5 YR 4/2;3/2 | fsl     | 1mgr      | mfr; dh     |
| B2t     | 12-31 | 5 YR 4/4;3/4   | cl      | ?mgr      | mfr; dh     |
| B3      | 31-48 | 5 YR 3/4       | cl      | 1mgr      | mfr; dh     |
| C       | 48-70 | 5 YR 5/6;4/6   | cl      | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 34.7                          | 51.5 | 13.8 | 21.1 | 1.4    | silt loam        |                |
| A12     | 35.8                          | 50.4 | 13.8 | 21.3 | 1.1    | silt loam        |                |

**Appendix Table 36.—TELLER FINE SANDY LOAM**

|  |   |
|--|---|
| Location: 1000 ft. S. and 300 ft. E.<br>of N.W. corner Sec. T<br>4 S, R 8 W. | Order: Mollisol<br>Subgroup: Udic Argiustoll<br>Family: fine-loamy, mixed,<br>thermic |
| Virgin or Cultivated: Cultivated   |   |
| Relief: gentle slopes, 1-3%  |   |

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-6   | 7.5 YR 5/2;3/2 | fsl     | 1mgr      | mvfr; dsh   |
| A12     | 6-12  | 7.5 YR 4/2;3/2 | fsl     | 1mgr      | mfr; dh     |
| B2t     | 12-24 | 5 YR 4/4;3/4   | cl      | 2mkk      | mfr; dh     |
| B3      | 24-45 | 5 YR 5/6;4/6   | scl     | 1mgr      | mfr; dh     |
| C       | 45-72 | 5 YR 6/6;5/6   | fsl     | 1mgr      | mufr; dsh   |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic |                |
|---------|-------------------------------|------|------|--------|-----------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. | matter    | Textural Class |
| Ap      | 63.6                          | 25.1 | 11.3 | 23.1   | 1.1       | sandy loam     |
| A12     | 57.2                          | 26.4 | 16.4 | 22.9   | 1.2       | sandy loam     |

**Appendix Table 37.—NOBSCOT FINE SAND NO. 1 (59-OK-77-1)**

|   |  |
|---|--|
| Location: 16 mi. W. and 6 mi. N.<br>of Vici, Okla. 1630 ft. W.<br>and 195 ft. N. of S.E.<br>corner of Sec. 5, T20N,<br>R22W, Woodward Coun-<br>ty, Okla .<br>Cultivated or Virgin: Virgin | Relief: 2%<br>Order: Alfisol<br>Subgroup: Arenic Haplustalf<br>Family: coarse loamy, siliceous,<br>thermic |
|---|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth (in.) | Color (D) | Texture | Structure | Consistence |
|---------|-------------|-----------|---------|-----------|-------------|
| Aoo     | 0-1/4       |           |         |           |             |
| A1      | 1/4-5       | 10 YR 5/2 | fs      | sg        | mvfr, dl    |
| A21     | 5-13        | 10 YR 6/3 | fs      | sg        | mvfr, dl    |
| A22     | 13-20       | 10 YR 6/3 | fs      | m         | mvfr, dsh   |
| B21     | 20-32       | 5 YR 6/8  | lfs     | m         | mvfr, dsh   |
| B22     | 32-44       | 5 YR 6/8  | fs      | m         | mvfr, dsh   |
| B3      | 44-54       | 5 YR 6/8  | fs      | m         | mvfr, dsh   |
| C       | 54-65†      | 5 YR 6/8  | fs      | m         | mvfr, dsh   |

**CHEMICAL DATA:**

| Horizon | pH with 1:1 soil-water ratio | % Organic matter | % N  | C.E.C. me/100g. | Exchangeable Cations me/100gms. |     |      |      |     | Free Iron % Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------|------------------|------|-----------------|---------------------------------|-----|------|------|-----|--|
|         |                              |                  |      |                 | Ca                              | Mg  | K    | Na   | H   |  |
| A1      | 6.6                          | 1.5              | .049 | 4.1             | 3.3                             | 0.4 | 0.1  | <0.1 | 1.9 | 0.2  |
| A21     | 6.1                          | .3               | .018 | 1.5             | 1.0                             | 0.2 | <0.1 | <0.1 | 0.7 | 0.1  |
| A22     | 5.7                          | .2               | .008 | 1.3             | 0.7                             | 0.1 | <0.1 | <0.1 | 0.7 | 0.1  |
| B21     | 5.3                          | .4               | .019 | 7.1             | 3.6                             | 1.5 | 0.2  | <0.1 | 2.8 | 0.4  |
| B22     | 5.2                          | .2               |      | 4.6             | 2.9                             | 1.0 | 0.1  | <0.1 | 1.6 | 0.3  |
| B3      | 5.9                          | .1               |      | 3.5             | 2.2                             | 0.8 | 0.1  | <0.1 | 1.4 | 0.2  |
| C       | 6.3                          | .1               |      | 3.0             | 1.9                             | 0.8 | 0.1  | <0.1 | 1.2 | 0.3  |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk Density |
|---------|-------------------------------|------|------|----------------------|------------|-----------|--------------|
|         | Sand                          | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |              |
| A1      | 90.1                          | 7.9  | 2.0  | 7.7                  | 3.6        | 2.0       |              |
| A21     | 93.6                          | 4.9  | 1.5  | 4.0                  | 1.4        | 0.6       |              |
| A22     | 94.8                          | 3.3  | 1.9  | 3.8                  | 1.2        | 0.8       |              |
| B21     | 87.2                          | 3.7  | 9.1  | 10.2                 | 6.8        | 4.3       | 1.69         |
| B22     | 90.8                          | 2.1  | 7.1  | 7.6                  | 4.4        | 2.7       |              |
| B3      | 92.4                          | 1.7  | 5.9  | 6.5                  | 3.6        | 1.9       | 1.66         |
| C       | 92.3                          | 2.5  | 5.2  | 6.0                  | 3.2        | 1.7       |              |

**Appendix Table 38.—NOBSCOT FINE SAND NO. 2 (59-OK-77-2)**

|  |  |
|--|--|
| Location: 16 mi. W. and 10½ mi.<br>N. of Vici, Okla. 445 ft.<br>E. and 106 ft. S. of W. ¼<br>corner of Sec. 20, T20N,<br>R22W. Woodward Coun-<br>ty, Okla.<br>Cultivated or Virgin: virgin | Relief: 3%<br>Order: Alfisol<br>Subgroup: Arenic Haplustalf<br>Family: coarse loamy, siliceous,<br>thermic |
|--|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth<br>(in.) | Color (D)  | Texture | Structure | Consistence |
|---------|----------------|------------|---------|-----------|-------------|
| A1      | 0-5            | 10 YR 5/2  | fs      | sg        | mlvfr       |
| A21     | 5-13           | 10 YR 7/2  | fs      | m         | mvfr, dsh   |
| A22     | 13-21          | 10 YR 8/3  | fs      | m         | mvfr, dsh   |
| A23     | 21-30          | 10 YR 7/3  | lfs/fs  | m         | mvfr, dh    |
| B21     | 30-40          | 7.5 YR 6/6 | lfs     | m         | mvfr, dh    |
| B22     | 40-51          | 7.5 YR 6/6 | fs      | m         | mvfr, dh    |
| C       | 51-56          | 7.5 YR 6/6 | fs      | m         | mvfr, dh    |

**CHEMICAL DATA:**

| Horizon | pH with 1:1<br>soil-water<br>ratio | %<br>Organic<br>matter | %<br>N | C.E.C.<br>me/100g. | Exchangeable Cations<br>me/100gms. |     |     |      |     | Free<br>Iron<br>%<br>Fe <sub>2</sub> O <sub>3</sub> |
|---------|------------------------------------|------------------------|--------|--------------------|------------------------------------|-----|-----|------|-----|---|
|         |                                    |                        |        |                    | Ca                                 | Mg  | K   | Na   | H   |   |
| A1      | 6.9                                | 1.8                    | .069   | 5.8                | 5.0                                | 0.7 | 0.2 | <0.1 | 1.4 | 0.2   |
| A21     | 6.6                                | .2                     | .009   | 1.4                | 1.2                                | 0.4 | 0.1 | <0.1 | 0.5 | 0.1   |
| A22     | 6.7                                | .1                     | .006   | 1.1                | 0.8                                | 0.1 | 0.1 | <0.1 | 0.5 | 0.2   |
| A23     | 6.2                                | .2                     | .008   | 3.3                | 2.1                                | 0.8 | 0.1 | <0.1 | 1.2 | 0.2   |
| B21     | 5.2                                | .2                     |        | 7.5                | 4.3                                | 1.9 | 0.2 | <0.1 | 3.3 | 0.4   |
| B22     | 5.8                                | .1                     |        | 4.2                | 2.7                                | 1.0 | 0.1 | <0.1 | 1.6 | 0.3   |
| C       | 5.9                                | .1                     |        | 3.5                | 2.1                                | 1.0 | 0.1 | <0.1 | 1.2 | 0.2   |

**PHYSICAL DATA:**

| Horizon | Particle<br>Size Distribution, % |      |      | % Water Retained at: |            |           | Bulk<br>Density |
|---------|----------------------------------|------|------|----------------------|------------|-----------|-----------------|
|         | Sand                             | Silt | Clay | 1/10 Atmos.          | 1/3 Atmos. | 15 Atmos. |                 |
| A1      | 85.6                             | 10.8 | 3.6  | 10.9                 | 4.9        | 2.6       |                 |
| A21     | 91.1                             | 6.8  | 2.1  | 5.0                  | 1.4        | 0.8       |                 |
| A22     | 93.1                             | 5.0  | 1.9  | 4.1                  | 1.2        | 0.5       |                 |
| A23     | 87.4                             | 7.1  | 5.5  | 7.9                  | 4.0        | 1.9       |                 |
| B21     | 80.9                             | 7.5  | 11.6 | 13.6                 | 8.2        | 4.6       | 1.73            |
| B22     | 89.8                             | 3.9  | 6.3  | 7.8                  | 4.6        | 2.6       |                 |
| C       | 90.6                             | 3.3  | 6.1  | 6.3                  | 3.6        | 2.2       |                 |

**Appendix Table 39.—NOBLE-LIKE LOAMY FINE SAND**

Location: 250 ft. E. and 140 ft. N.  
of S.W. corner of S.W. ¼  
Sec. 25 T 7 N, R 12 W.  
Order: Inceptisol  
Subgroup: Typic Ustochrept  
Family: coarse loamy, siliceous,  
thermic  
Virgin or Cultivated: Cultivated  
Relief: gentle foot slopes, 3-5%

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color        | Texture | Structure | Consistence |
|---------|-------|--------------|---------|-----------|-------------|
| Ap      | 0-6   | 5 YR 5/3;3/3 | fsl     | lfgr      | mvfr/dsh    |
| A12     | 6-12  | 5 YR 4/3;3/3 | fsl     | 2mgr      | mfr; dh     |
| B       | 12-36 | 5 YR 5/4;3/4 | fsl     | wcpr/2mgr | mfr; dh     |
| C       | 36-72 | 5 YR 4/6;3/6 | fsl     | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 83.7                          | 10.1 | 6.3  | 41.8 | 0.9    | loamy sand       |                |
| A12     | 79.8                          | 13.9 | 6.3  | 34.2 | 0.7    | loamy sand       |                |
| B       | 79.9                          | 11.3 | 8.8  | 32.5 | 0.6    | loamy sand       |                |
| C       | 68.4                          | 16.4 | 15.2 | 29.1 |        | loamy sand       |                |

**Appendix Table 40.—NOBLE LOAMY FINE SAND**

Location: 500 ft. N. and 100 ft. W.  
of S.E. corner Sec. 35 T  
10 N, R 12 W.  
Order: Inceptisol  
Subgroup: Typic Ustochrept  
Family: coarse-loamy, siliceous,  
thermic  
Virgin or Cultivated: Cultivated  
Relief: gentle foot slopes, 1-3%

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color        | Texture | Structure | Consistence |
|---------|-------|--------------|---------|-----------|-------------|
| Ap      | 0-11  | 5 YR 5/3;3/3 | fsl     | lfgr      | mfr; dh     |
| B21     | 11-24 | 5 YR 4/3;3/3 | fsl     | lcpr/lfgr | mfr; dh     |
| B22     | 24-44 | 5 YR 5/4;3/4 | fsl     | lcpr/lmgr | mfr; dh     |
| C       | 44-72 | 5 YR 5/6;4/6 | fsl     | m         | mfr; ch     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |      | V.F.S. | % organic matter | Textural Class |
|---------|-------------------------------|------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay |      |        |                  |                |
| Ap      | 85.4                          | 7.1  | 7.5  | 47.9 | 0.8    | loamy sand       |                |
| B21     | 81.8                          | 10.9 | 7.3  | 47.4 | 0.6    | loamy sand       |                |
| B22     | 62.0                          | 20.3 | 17.7 | 40.1 |        | sandy loam       |                |
| C       | 63.4                          | 21.5 | 15.1 | 40.4 |        | sandy loam       |                |

**Appendix Table 41.—NOBLE LOAMY FINE SAND**

|  |  |
|--|--|
| Location: 900 ft. N. and 100 ft. E.<br>of S.W. corner Sec. 6<br>T 8 N, R 11 W.<br>Virgin or Cultivated: Cultivated<br>Relief: gentle foot slopes, 1-3% | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: coarse-loamy, siliceous,<br>thermic |
|--|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| Ap      | 0-12  | 5 YR 5/3;3/3   | fsl     | 1fgr      | mvfr; dsh   |
| B21     | 12-26 | 5 YR 4/3;3/3   | fsl     | 1cpr/2fgr | mfr; dsh    |
| B22     | 26-44 | 2.5 YR 5/4;3/4 | fsl     | 1cpr/2fgr | mfr; dh     |
| C       | 44-72 | 5 YR 5/6;4/6   | fsl     | m         | mfr; dsh    |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| Ap      | 87.5                          | 7.5  | 5.0  | 30.5   | 0.4              | loamy sand     |
| B21     | 83.7                          | 10.0 | 6.3  | 27.5   | 0.6              | loamy sand     |
| B22     | 74.7                          | 11.4 | 13.9 | 27.7   |                  | sandy loam     |
| C       | 72.2                          | 12.6 | 15.2 | 38.6   |                  | sandy loam     |

**Appendix Table 42.—NOBLE LOAMY FINE SAND**

|   |  |
|---|--|
| Location: 100 ft. E. and 100 ft. N.<br>of S.W. corner Sec. 18<br>T 8 N, R 13 W.<br>Virgin or Cultivated: Cultivated<br>Relief: footslopes, 3-5% | Order: Inceptisol<br>Subgroup: Typic Ustochrept<br>Family: coarse-loamy, siliceous,<br>thermic |
|---|--|

**PROFILE DESCRIPTION:**

| Horizon | Depth | Color          | Texture | Structure | Consistence |
|---------|-------|----------------|---------|-----------|-------------|
| A1      | 0-14  | 5 YR 4/3;2/3   | fsl     | 1mfr      | mvfr; dsh   |
| B21     | 14-31 | 5 YR 4/4;3/4   | fsl     | 1cpr/2fgr | mfr; dsh    |
| B22     | 31-48 | 5 YR 5/4;3/4   | fsl     | 1c        | mfr; dh     |
| C       | 48-90 | 2.5 YR 4/6;3/6 | fsl     | m         | mfr; dh     |

**PHYSICAL DATA:**

| Horizon | Particle Size Distribution, % |      |      |        | % organic matter | Textural Class |
|---------|-------------------------------|------|------|--------|------------------|----------------|
|         | Sand                          | Silt | Clay | V.F.S. |                  |                |
| A1      | 77.3                          | 16.4 | 6.3  | 40.8   | 1.0              | loamy sand     |
| B21     | 72.3                          | 17.6 | 10.1 | 33.5   | 0.5              | sandy loam     |
| B22     | 68.4                          | 20.2 | 11.4 | 33.3   |                  | sandy loam     |
| C       | 63.4                          | 21.5 | 15.1 | 30.8   |                  | sandy loam     |