SOIL SURVEY OF

Taylor County, Texas

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Texas Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1958-70. Soil names and descriptions were approved in 1971. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Conservation Service and the Texas Agricultural Experiment Station. It is part of the technical assistance furnished to the Middle Clear Fork Soil and Water Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and ranches; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Taylor County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and shows the capability classification of each. It also shows the page where each soil is described and the page for the range site in which the soil has been placed.

Individual colored maps that show the have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those that have a moderate limitation can be colored yellow, and those that have a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and range sites.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

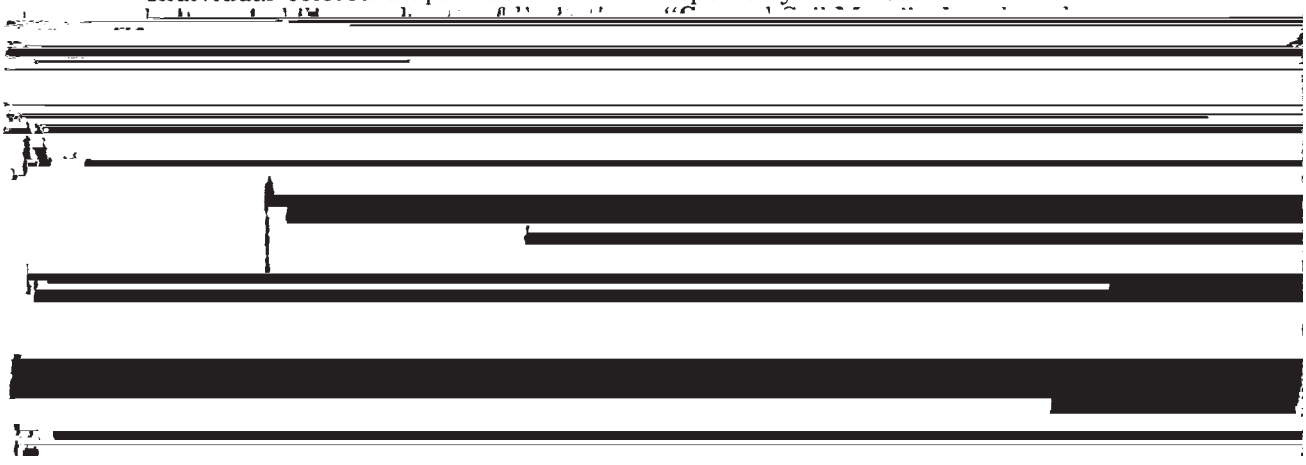
Ranchers and others can find, under "Use of the Soils for Range," groupings of the soils according to their suitability for range and, also, the names of many of the plants that grow on each range site.

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and recreation areas in the sections "Engineering Interpretations" and "Use of the Soils for Recreation."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Taylor County may be especially interested in the section



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SOIL SURVEY OF TAYLOR COUNTY, TEXAS

BY NATHANIEL R. CONNER, SOIL CONSERVATION SERVICE

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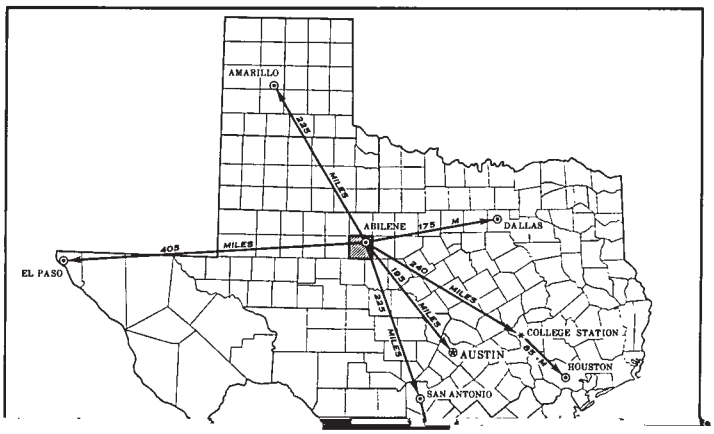
UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE,
IN COOPERATION WITH THE TEXAS AGRICULTURAL EXPERIMENT STATION

TAYLOR COUNTY is in north-central Texas (fig. 1). It has a total area of 586,240 acres, or 916 square miles, of which 1,856 acres is water.



county and is outlined in most areas by steep escarpments. The Edwards Plateau serves as a divide between the Clear Fork of the Brazos River and the Colorado River. The plateau soils are mostly shallow or moderately deep over limestone or marl.

The main employment in Taylor County is derived from farming. Cotton, grain sorghum, and wheat are the main cash crops. Cattle and sheep are the major kinds of livestock grown in the county.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Taylor County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and

differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Hamby fine sandy loam, 0 to 1 percent slopes, is one of several phases in the Hamby series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundation for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or a high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists,

title of association 1, the words "clay loams" refer to texture of the surface layer.

1. Sagerton-Rowena-Rotan Association

Deep, noncalcareous to calcareous clay loams

This association consists of nearly level to gently sloping soils on uplands. It makes up about 45 percent of the county. About 49 percent of the association is Sagerton soils, about 10 percent is Rowena soils, and about 8 percent is Rotan soils. The other 33 percent is minor soils. These are mostly Clairemont, Gageby, Mangum, Shep, and Tobosa soils.

Sagerton soils are on uplands that have convex surfaces. These soils have a surface layer of reddish-brown clay loam about 11 inches thick. The next layer is clay about 22 inches thick that is reddish brown in the upper part and red in the lower part. The underlying material is clay loam that is pink in the upper part and red in the lower part. This layer begins at a depth of 33 inches and extends to a depth of 80 inches or more.

Rowena soils are on uplands that have concave surfaces. These soils have a surface layer of dark grayish-brown

The soils of this association are used mostly for range. A few areas are used for crops. This association provides some of the most extensive areas of grazing land in the county. The Tobosa soils are suited to crops, but the Tarrant soils are not because of their shallow depth. This association has potential for wildlife development. If the soils are used for wildlife development, the Tarrant soils are suited to wild herbaceous upland plants, hardwood trees, shrubs, and vines; and the Tobosa soils are suited to grain, seed crops, and grasses and legumes. The Tarrant soils are suited as habitat for brushland wildlife, and the Tobosa soils are suited as habitat for open-land and brushland wildlife.

3. Tillman-Vernon Association

Deep and moderately deep, noncalcareous to calcareous clay loams to clays

This association consists of nearly level to strongly sloping soils on broad plains and low, smooth, convex ridges that are dissected by intermittent drainageways and creeks. The association makes up about 12 percent of the

about 56 inches thick. The underlying material is light-red clay loam that begins at a depth of 66 inches and extends to a depth of 83 inches. The Miles soils have a surface layer of reddish-brown fine sandy loam about 9 inches thick. The next layer is reddish-brown sandy clay loam about 53 inches thick. The underlying material is yellowish-red sandy clay loam that begins at a depth of 62 inches and extends to a depth of 80 inches.

Colorado soils are on smooth benches above creek chan-

Descriptions of the Soils

This section describes the soil series and mapping units in Taylor County. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent	Soil	Acres	Percent
Clairemont silty clay loam	7,920	1.4	Rowena clay loam, 0 to 1 percent slopes	21,640	3.7
Clairemont-Urban land complex	3,210	.5	Rowena clay loam, 1 to 3 percent slopes	5,220	.9

Figure 2.—**An area of Badland that shows effects of erosion.**

soils make up less than 15 percent of the mapped acreage of this soil.

vations or coverings of contrasting soil material. Most of the structures are single-unit dwellings and have been

Cobb Series

The Cobb series consists of moderately deep, gently sloping, well-drained, loamy soils on uplands. These soils formed in loamy sediment over red sandstone.

In a representative profile the surface layer is reddish-brown fine sandy loam about 7 inches thick. The subsoil is reddish-brown, friable sandy clay loam about 26 inches thick. This layer rests abruptly on red weakly cemented sandstone that extends to a depth of 42 inches.

Permeability is moderate in these soils. Internal drainage is medium. The hazard of soil blowing is moderate.

The Cobb soils are used for crops and range.

Representative profile of Cobb fine sandy loam, 1 to 3 percent slopes, in a cultivated field, 1 mile west on Farm Road 1085 from junction with Farm Road 126, 0.25 mile south on county road, and 250 feet east:

Ap—0 to 7 inches, reddish-brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; single grained; slightly hard, friable, nonsticky; neutral; abrupt, smooth boundary.

B21t—7 to 26 inches, reddish-brown (2.5YR 5/4) sandy clay loam, dark reddish brown (2.5YR 3/4) moist; moderate, very coarse, prismatic structure parting to moderate, medium, subangular blocky; hard, friable, slightly sticky; few clay films; common very fine worm casts; neutral; gradual, smooth boundary.

B22t—26 to 33 inches, reddish-brown (2.5YR 5/4) sandy clay loam, dark reddish brown (2.5YR 3/4) moist; moderate, very coarse, prismatic structure parting to moderate, medium, subangular blocky; hard, friable, slightly sticky; few clay films; common very fine worm casts; 15 percent, by volume, sandstone fragments coated with clay films; neutral; abrupt, wavy boundary.

C—33 to 42 inches, red (2.5YR 4/8) weakly cemented sandstone.

The A horizon ranges from 6 to 10 inches in thickness. It is brown or reddish brown. Reaction is slightly acid to neutral.

The B2t horizon ranges from 14 to 30 inches in thickness. It is reddish brown or red. Reaction is slightly acid to neutral.

Depth to the C horizon ranges from 20 to 40 inches. This horizon is red sandstone that in places is interbedded with calcareous clay and shale. Reaction is slightly acid to mildly alkaline.

Cobb fine sandy loam, 1 to 3 percent slopes (CoB).—This gently sloping soil is on slightly convex upland ridges and plains. Areas are irregular in shape and range from 10 to 250 acres in size.

Included with this soil in mapping are small areas of Cosh, Miles, and Sagerton soils and a few areas where slopes are slightly more than 3 percent. Also included are a few areas that have gullies 400 to 700 feet apart, 4 feet deep, and 10 to 20 feet wide. These included areas make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are cultivated. Capability unit IIIe-4; Sandy Loam range site.

Colorado Series

The Colorado soils are used for range.

Representative profile of Colorado soils, frequently flooded, in range, 3.2 miles south and west of intersection of Farm Road 126 and Interstate 20 in Merkel, 7 miles south on county road from junction with Farm Road 126 and 50 feet west:

A1—0 to 6 inches, light-brown (7.5YR 6/4) loam, dark brown (7.5YR 4/4) moist; weak granular structure; slightly hard, friable, sticky; common very fine worm casts; discontinuous stratification evident; calcareous; moderately alkaline; clear, smooth boundary.

C—6 to 60 inches, reddish-brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak granular and thin platy structure, related to evident bedding planes; slightly hard, friable, sticky; stratified (⅛ to ¼ inch thick) with silt loam, fine sandy loam, and clay loam; some strata grade to hue of 7.5YR; common very fine worm casts; calcareous; moderately alkaline.

The A horizon ranges from 4 to 10 inches in thickness. It is brown, light-brown, or reddish-brown loam to clay loam.

The C horizon is reddish-brown or reddish-yellow loam, clay loam, and sandy clay loam to fine sandy loam. Individual strata in this horizon range from loamy fine sand to light clay. A few films and threads of calcium carbonate are below a depth of 10 inches.

Colorado soils, frequently flooded (Cr).—These nearly level soils are on smooth benches above creek channels. Areas are narrow and long in shape, range from 20 to 400 acres in size, and extend for several miles. Slopes are 0 to 1 percent.

Included with these soils in mapping are small areas of Clairemont, Mangum, and Rowena soils and areas of a soil that is similar to these Colorado soils but has a darker surface layer. Also included are a few saline areas that are 1 acre to 10 acres in size. These included areas make up less than 15 percent of the mapped acreage of this soil.

These soils are used for range, pasture, and wildlife habitat. They flood one or more times in a 4- to 10-year period. Capability unit Vw-1; Loamy Bottomland range site.

Cosh Series

The Cosh series consists of shallow, gently sloping, well-drained, loamy soils on uplands. These soils formed in loamy sediment over red sandstone.

In a representative profile the surface layer is reddish-brown fine sandy loam about 7 inches thick. The subsoil is red, friable sandy clay loam about 11 inches thick. This layer rests abruptly on red, weakly cemented sandstone.

Permeability is moderate in these soils. Internal drainage is medium. The hazard of soil blowing is moderate.

The Cosh soils are used for crops and range.

Representative profile of Cosh fine sandy loam, 1 to 3 percent slopes, in range, 1 mile west on Farm Road 1085 from junction with Farm Road 126, 0.5 mile south and 0.5 mile west on county road and 200 ft south

moderate, medium and fine, subangular blocky; hard, friable, slightly sticky; few clay films; common very fine worm casts; neutral; mildly alkaline; abrupt, smooth boundary.

C—18 to 30 inches, red (2.5YR 4/8), weakly cemented, noncalcareous sandstone.

The A horizon ranges from 4 to 9 inches in thickness. It is reddish brown or brown. Reaction is neutral to slightly acid.

The B2t horizon ranges from 7 to 11 inches in thickness. It is red or reddish brown. Reaction is neutral to mildly alkaline.

Depth to the C horizon ranges from 12 to 20 inches. This horizon is red sandstone that in places is interbedded with calcareous clay and shale.

Cosh fine sandy loam, 1 to 3 percent slopes (CsB).—This gently sloping soil is on convex upland ridges and knolls. Areas are irregular to oval in shape and range from 10 to 50 acres in size.

Included with this soil in mapping are small areas of Cobb soils and areas of a soil that is similar to this Cosh

medium, blocky structure; very hard, firm, sticky; few pockets of calcium carbonate; calcareous; moderately alkaline.

The A horizon ranges from 20 to 40 inches in thickness. It is brown, light brown, or grayish brown. Reaction is neutral or slightly acid.

The B2t horizon is brown, pale-brown, brownish-yellow, or red clay to sandy clay loam. Reaction ranges from neutral to medium acid in the upper part and from moderately alkaline to slightly acid in the lower part. This horizon is mottled with olive, yellow, brown, gray, and red.

Demona soils in Taylor County are outside the range defined for the series. They have concretions and soft masses of calcium carbonate at a depth of 42 to 52 inches in about 60 percent of the profiles and the B22t horizon is moderately alkaline.

Demona fine sand, alkaline subsoil variant, 0 to 3 percent slopes (DeB).—This nearly level to gently sloping soil is on uplands and concave foot slopes. Areas are irregular in shape and range from 30 to 200 acres in size.

silty, clayey, and sandy sediment; calcareous; moderately alkaline; gradual, wavy boundary.

B22—42 to 59 inches, yellowish-red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate, fine, granular and subangular blocky structure; hard, firm, slightly sticky; common worm casts; discontinuous thin strata of silty, clayey, and sandy sediment; calcareous; moderately alkaline; gradual, wavy boundary.

C—59 to 80 inches, yellowish-red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; massive; few films and threads of calcium carbonate; hard, friable, slightly sticky; calcareous; moderately alkaline.

The A horizon ranges from 10 to 30 inches in thickness. It is dark brown or dark grayish brown. Reaction is mildly alkaline or moderately alkaline.

The B2 horizon ranges from 15 to 35 inches in thickness. It is yellowish-red, reddish-brown, or dark grayish-brown sandy clay loam and clay loam to silty clay loam.

medium, subangular blocky; hard, firm, sticky; clay films on prisms and ped faces; few fine roots; common fine pores; neutral; gradual, smooth boundary.

B23t—48 to 66 inches, red (2.5YR 5/8) clay, red (2.5YR 4/8) moist; moderate, coarse, prismatic structure parting to moderate, medium, subangular blocky; hard, firm, sticky; clay films on ped faces; few fine pores; mildly alkaline; gradual, smooth boundary.

B24t—66 to 83 inches, light-red (2.5YR 6/8) clay loam, red (2.5YR 5/8) moist; moderate, coarse, prismatic structure parting to moderate, medium, subangular blocky; slightly hard, friable, slightly sticky; few clay films on ped faces; few fine pores; mildly alkaline.

The A horizon ranges from 7 to 18 inches in thickness. It is reddish-brown, brown, or pale-brown fine sandy loam to loamy fine sand.

The Bt horizon ranges from 50 to more than 70 inches in thick-

been removed by erosion. These included areas make up

Permeability is moderately slow in these soils. Internal

cultivated field, 0.6 mile east on Industrial Boulevard from junction with Business U.S. 83 and 0.7 mile north:

Ap—0 to 9 inches, reddish-brown (2.5YR 5/4) silty clay loam, reddish brown (2.5YR 4/4) moist; weak subangular blocky and granular structure; hard, friable, sticky; calcareous; moderately alkaline; abrupt, smooth boundary.

C1—9 to 54 inches, reddish-brown (2.5YR 5/4) silty clay, reddish brown (2.5YR 4/4) moist; massive; very hard, friable, sticky; thinly stratified (1/16 to 1/2 inch thick); common films and threads of calcium carbonate; few worm casts and fine pores; calcareous; moderately alkaline; gradual, smooth boundary.

C2—54 to 81 inches, red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; massive; thinly stratified (1/16 to 1/2 inch thick) with

range from 50 to 250 acres in size. Slopes are 0 to 1 percent.

These soils have a surface layer of reddish-brown clay, silty clay, silt loam, or silty clay loam about 8 inches thick. The next layer is reddish-brown, firm clay that extends to a depth of 72 inches and is stratified with loamy and gravelly material. Areas of these Mangum soils are cut by winding stream channels. They contain potholes that hold water for extended periods after flooding. Several inches of sandy, loamy, and clayey sediments may be deposited during flooding.

Included with these soils in mapping are small areas of

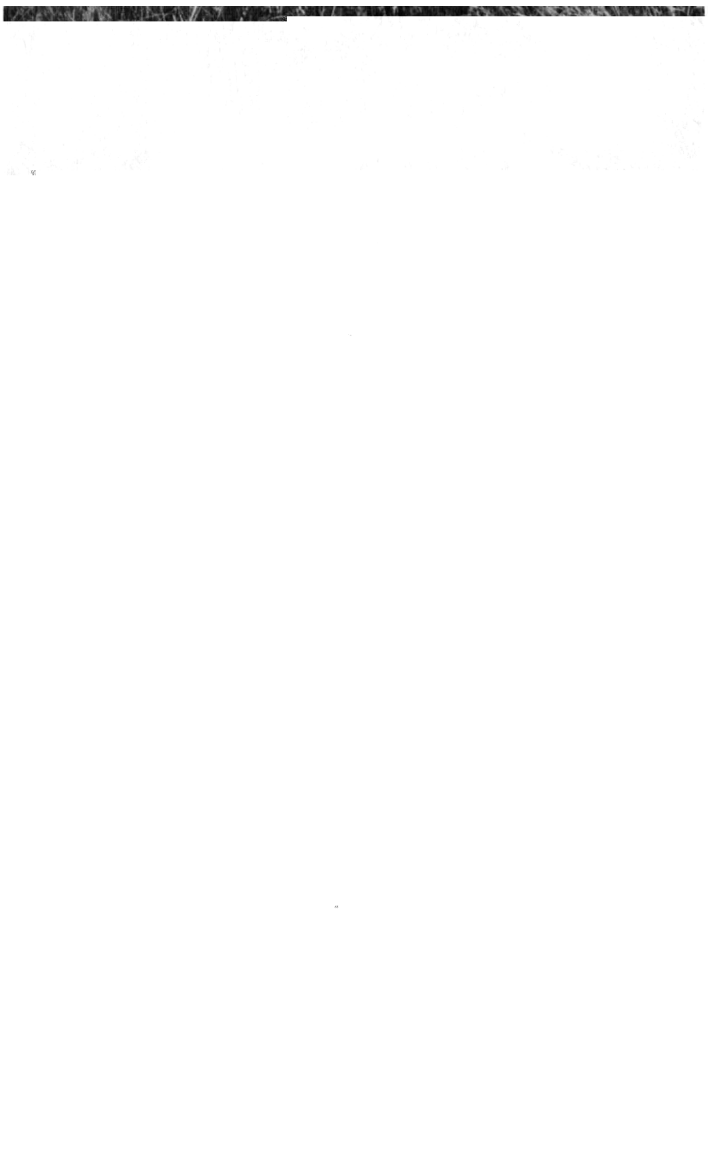


Figure 3.—**Profile of Mereta clay loam. Strongly cemented caliche is below a depth of 18 inches.**

Mereta clay loam, 0 to 1 percent slopes (MrA).—This nearly level soil is on slightly convex upland ridges and knolls. Areas are irregular in shape and range from 10 acres to 150 acres in size.

This soil has a surface layer of dark grayish-brown clay loam about 9 inches thick. The next layer is dark-brown, friable clay loam about 9 inches thick. This layer rests abruptly on strongly cemented caliche about 3 inches thick. The underlying material is brown, limy silty clay loam that extends to a depth of about 45 inches.

Included with this soil in mapping are small areas of Kavett, Pitzer, Rowena, Tarrant, and Weymouth soils. Also included are areas of a soil that is similar to this Mereta soil but has a surface layer of loam. These included soils make up less than 15 percent of the mapped

Mereta clay loam, 1 to 3 percent slopes (MrB).—This gently sloping soil is on slightly convex upland ridges and knolls. Areas are irregular in shape and range from 10 to 150 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Kavett, Tarrant, Valera, and Weymouth soils. Also included are areas of a soil that is similar to this Mereta soil but has a surface layer of loam. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of these soils are used for range. Capability unit IIIe-7; Shallow range site.

Mereta clay loam, 3 to 5 percent slopes (MrC).—This gently undulating soil is on slightly convex upland ridges and knolls. Areas are irregular in shape and range from 15 to 50 acres in size.

This soil has a surface layer of dark-brown clay loam about 10 inches thick. The next layer is brown, friable clay loam about 10 inches thick. This layer rests abruptly on strongly cemented caliche about 7 inches thick. The underlying material is reddish-yellow, friable clay loam that extends to a depth of about 70 inches. Yellow marly earth of about silty clay loam texture is at a depth of 80 inches.

Included with this soil in mapping are small areas of Kavett, Pitzer, Speck, and Tarrant soils. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for range. Capability unit IVe-1; Shallow range site.

Miles Series

The Miles series consists of deep, nearly level to gently undulating, well-drained, loamy soils on uplands. These soils formed in loamy sediment.

In a representative profile (fig. 4) the surface layer is reddish-brown fine sandy loam about 9 inches thick. The upper part of the subsoil is reddish-brown, friable sandy clay loam about 53 inches thick. The lower part is yellowish-red sandy clay loam that contains soft masses of calcium carbonate and extends to a depth of about 80 inches.

Permeability is moderate in these soils. Internal drainage is medium. The hazard of soil blowing is moderate.

The Miles soils are used for crops and range.

Representative profile of Miles fine sandy loam, 0 to 1 percent slopes, in a cultivated field, 0.3 mile northeast on Farm Road 126 from junction with Santa Fe Railroad and 100 feet south:

Ap—0 to 9 inches, reddish-brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak, fine, blocky structure; slightly hard, friable; nonsticky; few fine roots; neutral; abrupt, smooth boundary.

B21t—9 to 32 inches, reddish-brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate, coarse, prismatic structure parting to moderate, medium and fine, subangular blocky; very hard, friable, slightly sticky; few clay films on vertical surfaces of peds; few fine chert and quartzite fragments of pebble size; neutral; gradual, smooth boundary.

B22t—32 to 62 inches, reddish-brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate, coarse, pris-

Figure 4.—**Profile of Miles fine sandy loam.**

B3ca—62 to 80 inches, yellowish-red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; weak, very fine, subangular blocky structure; very hard, friable, slightly sticky; few fine chert fragments; about 5 percent soft masses of calcium carbonate; calcareous; moderately alkaline.

The A horizon ranges from 7 to 12 inches in thickness. It is reddish brown or light brown. Fine to medium quartzitic fragments of pebble size are on the surface in some areas.

The Bt horizon ranges from 50 to more than 100 inches in thickness. The Bt horizon is reddish brown, yellowish red, or red. Reaction is neutral to moderately alkaline.

The Bca horizon is yellowish red, reddish yellow, red, or reddish brown. It is 5 to 15 percent, by volume, films, threads, and masses of calcium carbonate.

Miles fine sandy loam, 0 to 1 percent slopes (MsA).—This nearly level soil is on uplands. Areas are irregular in shape and range from 25 to 300 acres in size.

This soil has a surface layer of reddish-brown fine sandy loam about 7 inches thick. The next layer is friable sandy clay loam about 54 inches thick that is reddish brown in the upper part and yellowish red in the lower part. The underlying material is reddish-yellow sandy clay loam that contains about 10 percent soft masses of calcium carbonate and extends to a depth of about 80 inches.

Included with this soil in mapping are small areas of Cobb and Sagerton soils and a few areas of soils that have a surface layer of loamy fine sand. Also included are some areas of soils that have gullies 1 foot to 3 feet deep, 10 to 24 feet wide, and 300 to 700 feet apart. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of these soils are used for crops. Capability unit IIIe-1; Sandy Loam range site.

Miles fine sandy loam, 3 to 5 percent slopes (MsC).—This gently undulating soil is on ridges and foot slopes. Areas are irregular in shape and range from 20 to 50 acres in size.

This soil has a surface layer of reddish-brown fine sandy loam about 9 inches thick. The next layer is friable sandy clay loam about 34 inches thick that is reddish brown in the upper part and red in the lower part. The underlying material is red sandy clay loam that contains about 10 percent soft masses of calcium carbonate and extends to a depth of about 80 inches.

Included with this soil in mapping are small areas of Cobb, Hamby, and Shep soils and a few areas where the surface layer is loamy fine sand. Also included are some areas of soils that have gullies 1 foot to 3 feet deep, 8 to 20 feet wide, and 300 to 700 feet apart. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of these soils are used for crops and range. Capability unit IIIe-4; Sandy Loam range site.

Owens Series

The Owens series consists of shallow, gently sloping to strongly sloping, well-drained, clayey soils on uplands. These soils formed in clayey shale.

In a representative profile the surface layer is reddish-brown clay about 7 inches thick. The next layer is reddish-brown, firm clay about 9 inches thick. The underlying material is weak-red shaly clay that contains common bluish spots and streaks and extends to a depth of about 24 inches.

Permeability is very slow in these soils. Internal drainage is slow. The hazard of water erosion is severe, and the hazard of soil blowing is slight.

C—16 to 24 inches, weak-red (10R 5/3) shaly clay, weak red (10R 4/3) moist; common bluish spots and streaks; calcareous; moderately alkaline.

The A horizon ranges from 6 to 10 inches in thickness. It is reddish-brown, red, or olive-brown clay, silty clay, or silty clay loam.

The Bca horizon ranges from 6 to 10 inches in thickness. It is red-

pebble size in a weakly cemented porous mass; calcareous; moderately alkaline; clear, smooth boundary.

IIC—76 to 80 inches, red (2.5YR 5/6) clayey shale, red (2.5YR 5/6) moist; few splotches and strata of greenish gray; calcareous; moderately alkaline.

The A horizon ranges from 4 to 14 inches in thickness. It is dark

Figure 5.—**Profile of Pitzer and Weymouth soils. Pitzer soils are 4 to 14 inches deep over indurated caliche. Weymouth soils are 20 to 30 inches deep over softer materials.**

Vernon series. The Sagerton soils are at the lower elevations where slopes range from 0 to 3 percent. The Vernon soils are on the sloping areas below the Pitzer soils, generally in the same position as the Weymouth soils.

Pitzer soils dominate this complex and are on the crests of ridges and knolls. Weymouth soils are on the slopes and lower areas below the Pitzer soils. The Pitzer soils have a surface layer of dark grayish-brown gravelly loam about 9 inches thick. This layer rests abruptly on indurated caliche about 3 inches thick. The next layer is pink caliche about 46 inches thick that is about 50 percent caliche-coated siliceous fragments of pebble size. The underlying material is red clayey shale that extends to a depth of about 84 inches.

The Weymouth soils have a surface layer of brown clay loam about 6 inches thick. The next layer is reddish-brown clay loam about 8 inches thick. The next layer is yellowish-red clay loam about 13 inches thick that is about 15 percent, by volume, calcium carbonate. The underlying material is shaly clay that extends to a depth of about 36 inches.

Most areas of this complex are used for range. Capability unit VIs-1; Pitzer soil in Very Shallow range site; Weymouth soil in Clay Loam range site.

Quanah Series

The Quanah series consists of deep, gently sloping, well-drained, loamy soils on uplands. These soils formed in calcareous loamy sediment.

In a representative profile the surface layer is dark grayish-brown clay loam about 17 inches thick. The next layer is brown, friable clay loam about 15 inches thick. The next 28 inches is light yellowish-brown, friable sandy clay loam that contains common films and threads of calcium carbonate. The underlying material, which extends to a depth of about 72 inches, is light reddish-brown stratified loamy sediment that contains an estimated 10 to 12 percent visible concretions of calcium carbonate and fragments of limestone.

Permeability is moderate in these soils. Internal drainage is medium. The hazard of soil blowing is slight.

The Quanah soils are used for range and crops.

Representative profile of Quanah clay loam, 1 to 3 percent slopes, in a cultivated field, 4.9 miles south on Farm Road 126 from junction with Farm Road 1085, 2 miles south on county road, and 0.6 mile southwest:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak, fine, subangular blocky structure parting to moderate, very fine, granular; slightly hard, friable, slightly sticky; about 20 percent, by volume, worm casts; common fine to medium fragments of limestone and concretions of calcium carbonate; calcareous; moderately alkaline; abrupt, smooth boundary.

A1—8 to 17 inches, dark grayish-brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak, fine, subangular blocky structure parting to moderate, very fine, granular; slightly hard, friable, slightly sticky; about 20 percent, by volume, worm casts; common fine to medium fragments of limestone and concretions of calcium carbonate; few films and threads of calcium carbonate; calcareous; moderately alkaline; gradual, smooth boundary.

B2—17 to 32 inches, brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak, fine, subangular blocky structure

friable, slightly sticky; about 6 percent visible concretions of calcium carbonate and fragments of limestone; common films and threads of calcium carbonate; calcareous; moderately alkaline; clear, wavy boundary.

B2ca—32 to 60 inches, light yellowish-brown (10YR 6/4) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate, fine, granular structure; slightly hard, friable, slightly sticky; common films and threads of calcium carbonate; 24 percent calcium carbonate equivalent; calcareous; moderately alkaline; diffuse, wavy boundary.

Cca—60 to 72 inches, light reddish-brown (5YR 6/4) stratified

depressions and intermittent lakes, or playas. These soils formed in calcareous clayey sediment.

In a representative profile the surface layer is dark-gray clay about 13 inches thick. The next layer is gray, extremely firm clay about 39 inches thick. The underlying material is massive, light-gray clay that extends to a depth of 90 inches.

Permeability is very slow in these soils. Internal drainage is very slow. Water enters rapidly through cracks

tion with Texas Highway 351 and 200 feet south:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak, fine, granular structure; slightly hard, friable, slightly sticky; calcareous; moderately alkaline; abrupt, smooth boundary.

A11—8 to 21 inches, dark grayish-brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate, very fine, subangular blocky structure parting to fine granular; hard, friable, sticky; calcareous; moderately alkaline; clear, wavy boundary.

A12—21 to 30 inches, yellowish-brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate, fine, subangular blocky structure; very hard, friable, sticky; calcareous; moderately alkaline; gradual, wavy boundary.

C—30 to 80 inches, brown (7.5YR 5/4) clay loam stratified with very fine sandy loam, silt loam, and clay and coarse-textured strata 2 to 20 millimeters thick, dark brown (7.5YR 4/4) moist; hard, friable, sticky; few soft masses of calcium carbonate; calcareous; moderately alkaline.

This land type consists of hilly to steep, rough and broken areas that are mostly along escarpments. The escarpments have an elevation change of 200 to 700 feet over a horizontal distance of 200 to 1,000 feet. Rock covers 10 to 40 percent of the land surface.

Rock outcrop has little value for farming because the rock limits the use of farm equipment. Also, the vegetation on some areas is too sparse for grazing.

Rock outcrop is mapped only with Tarrant soils and Ustochrepts.

Rotan Series

The Rotan series consists of deep, nearly level to gently sloping, well-drained, clayey soils on uplands. These soils formed in calcareous clayey sediment.

In a representative profile the surface layer is dark-

Depth to the Bca horizon ranges from 30 to 60 inches. This horizon is reddish yellow or pink. It is 15 to 45 percent, by volume, soft masses of calcium carbonate.

The Bt horizon that is below the Bca horizon is reddish yellow, light red, red, yellowish red, or strong brown.

Rotan clay loam, 0 to 1 percent slopes (RnA).—This nearly level soil is on broad uplands. Areas are irregular in shape and range from 30 to 700 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Randall soils in depressions, or playas, and Rowena and Sagerton soils. Also included are areas of Clairemont, Gageby, and Mangum soils in the narrow drainageways that dissect these areas. These included soils make up less

structure parting to moderate, very fine, subangular blocky; very hard, firm, sticky; calcareous; moderately alkaline; clear, smooth boundary.

B22—14 to 24 inches, dark-brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; weak to moderate, fine and very fine, blocky structure; very hard, firm, sticky; shiny pressure faces on peds; calcareous; moderately alkaline; clear, smooth boundary.

B23ca—24 to 58 inches, reddish-yellow (7.5YR 7/6) clay, reddish yellow (7.5YR 6/6) moist; weak, very fine, subangular blocky structure; very hard, friable, sticky; about 15 percent fine and coarse soft lumps of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

Cca—58 to 64 inches, reddish-yellow (5YR 7/6) clay, reddish yellow (5YR 6/6) moist; massive; few very fine concretions of calcium carbonate; 10 to 15 percent, by volume, segregated calcium carbonate; calcareous; moderately alkaline.

of these structures are single-unit dwellings. Much of the soil in areas of Urban land has been altered by excavations. Some areas have been covered with contrasting soil material that is 6 inches to 1 foot deep.

Some of the hazards in urban development on this complex are cracking and shifting of structures because of the shrink-swell potential of the soils, failure of uncoated steel pipes because of corrosivity, failure of septic tank filter fields caused by moderately slow permeability, and failure of local roads and streets because of poor traffic-supporting capacity.

If the soils of this complex are used for landscaping and gardening, they respond well to yearly applications of nitrogen and phosphorus fertilizer. Chlorosis, or leaf yellowing, may occur in plants that are sensitive to high concentrations of lime. The lime limits availability of iron to the plants and thus causes the yellowing of the leaves. Not assigned to a capability unit and range site.

Sagerton Series

The Sagerton series consists of deep, nearly level to gently sloping, well-drained, loamy soils. These soils formed in calcareous loamy sediment.

In a representative profile the surface layer is reddish-brown clay loam about 11 inches thick. The subsoil extends to a depth of about 80 inches. The upper 22 inches of the subsoil is firm clay that is reddish brown in the upper part and red in the lower part. The middle 14 inches is pink, friable clay loam that contains calcium carbonate. The lower 33 inches of the subsoil is red, friable clay loam that contains calcium carbonate.

Permeability is moderately slow in these soils. Internal drainage is slow. The hazard of soil blowing is slight.

The Sagerton soils are used for crops.

Representative profile of Sagerton clay loam, 0 to 1 percent slopes, in a cultivated field, 1 mile south on U.S. Highway 84 from junction with Farm Road 614, 1.25 miles east on county road, and 100 feet south:

Ap—0 to 11 inches, reddish-brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; weak granular structure; hard, friable; neutral; mildly alkaline; abrupt, smooth boundary.

B21t—11 to 22 inches, reddish-brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate, medium and fine, blocky structure; very hard, firm, sticky; common clay films; neutral; mildly alkaline; gradual, smooth boundary.

is red, strong-brown, reddish-brown, brown, or pink clay loam to clay. It is 15 to 40 percent calcium carbonate.

Sagerton clay loam, 0 to 1 percent slopes (SaA).—This nearly level soil is on broad uplands. Areas are irregular in shape and range from 100 to 500 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Miles and Rotan soils. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for crops, but a few areas are used for range. Capability unit IIc-1; Clay Loam range site.

Sagerton clay loam, 1 to 3 percent slopes (SaB).—This gently sloping soil is on convex uplands. Areas are irregular in shape and range from 75 to 200 acres in size.

This soil has a surface layer of reddish-brown clay loam about 11 inches thick. The next layer is firm clay loam about 31 inches thick that is reddish brown in the upper part and red in the lower part. The underlying material, which extends to a depth of about 80 inches, is strong-brown, firm clay loam that contains about 17 percent soft masses of calcium carbonate.

Included with this soil in mapping are small areas of Hamby, Miles, and Rotan soils. Also included are areas of a soil that is similar to this Sagerton soil, but the surface layer is lighter in color.

Most areas of this soil are used for crops, but a few areas are used for range. Capability unit IIe-1; Clay Loam range site.

Sagerton-Urban land complex, 0 to 3 percent slopes (SeB).—This complex is on nearly level to gently sloping built-up areas within metropolitan areas of Taylor County. About 65 percent of the complex is Sagerton clay loam, 20 percent is Urban land, and 15 percent is included soils of the Rotan, Rowena, Tillman, Tobosa, and Weymouth series.

Sagerton soils have a surface layer of dark-brown clay loam about 11 inches thick. The next layer is firm clay about 29 inches thick that is reddish brown in the upper part and yellowish red in the lower part. The underlying material, which extends to a depth of about 60 inches, is

Shep Series

The Shep series consists of deep, gently sloping to sloping, well-drained, loamy soils on uplands. These soils formed in loamy colluvial material.

In a representative profile the surface layer is brown loam about 8 inches thick. The next layer is reddish-brown, friable loam about 17 inches thick. The underlying material, which extends to a depth of about 80 inches, is light reddish-brown, friable sandy clay loam that contains concretions, films, and threads of calcium carbonate.

Permeability is moderate in these soils. Internal drainage is medium. The hazard of soil blowing is moderate.

The Shep soils are used for range and crops.

Representative profile of Shep loam, 1 to 3 percent slopes, in range, 3 miles south-southwest on Farm Road 126 from junction with Interstate 20, 6.1 miles south on unnumbered county road, and 250 feet east:

A1—0 to 8 inches, brown (7.5YR 5/2) loam, dark brown (7.5YR 4/2) moist; weak, fine, granular structure; slightly hard, friable, slightly sticky; calcareous; moderately alkaline; abrupt, smooth boundary.

B2—8 to 25 inches, reddish-brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak, coarse, prismatic structure parting to weak, fine, granular; slightly hard, friable, slightly sticky; common very fine worm casts; common nodular concretions of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

C1ca—25 to 36 inches, light reddish-brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4) moist; massive; slightly hard, friable; few worm casts; 10 to 15 percent nodular concretions of calcium carbonate; common films and threads of calcium carbonate; calcareous; moderately alkaline; diffuse, wavy boundary.

C2ca—36 to 80 inches, light reddish-brown (5YR 6/4) sandy clay loam, reddish brown (5YR 4/4) moist; massive; slightly hard, friable; 5 to 10 percent concretions of calcium carbonate; common coated quartz and limestone fragments ½ to 1 inch in diameter; calcareous; moderately alkaline.

The A horizon ranges from 4 to 12 inches in thickness. It is brown, grayish brown, pale brown, or reddish brown.

The B2 horizon ranges from 12 to 20 inches in thickness. It is red-brown, friable sandy clay loam that contains about 12 percent calcium carbonate and extends to a depth of about 60 inches.

Included with this soil in mapping are small areas of Quanah and Vernon soils and a soil that is similar to this Shep soil but has less clay in the lower layers. Also included are a few areas of soils that have gullies 1 foot to 6 feet deep, 10 to 30 feet wide, and 30 to 1,000 feet apart. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for range. A few areas are used for crops. Capability unit IVe-1; Sandy Loam range site.

Shep loam, 5 to 8 percent slopes (ShD).—This sloping soil is on convex foot slopes. Areas are irregular in shape and range from 25 to 50 acres in size.

This soil has a surface layer of brown loam about 6 inches thick. The next layer is brown, friable loam about 24 inches thick. The underlying material is brown, friable loam that contains about 15 percent calcium carbonate and extends to a depth of about 60 inches.

Included with this soil in mapping are small areas of Pitzer, Quanah, and Vernon soils. Also included are a few areas of soils that have gullies 1 foot to 6 feet deep, 1 foot to 12 feet wide, and 100 to 400 feet apart. These included soils make up less than 15 percent of the mapped acreage of this soil.

These soils are used for range. Capability unit VIe-2; Sandy Loam range site.

Speck Series

The Speck series consists of shallow, nearly level to gently sloping, well-drained, loamy soils on uplands. These soils formed in loamy to clayey sediment underlain by limestone.

In a representative profile the surface layer is reddish-brown clay loam about 7 inches thick. The subsoil is red-

Speck clay loam, 0 to 1 percent slopes (SpA).—This nearly level soil is on the crests of uplands. Areas are irregular to oval in shape and range from 15 to 50 acres in size.

This soil has a surface layer of brown clay loam about 8 inches thick. The next layer is reddish-brown, firm clay about 12 inches thick. This layer rests abruptly on fractured limestone.

Included with this soil in mapping are small areas of

The A horizon ranges from 6 to 15 inches in thickness. It is reddish brown, red, or reddish gray.

The AC horizon ranges from 30 to 36 inches in thickness. It is reddish-brown or weak-red silty clay to clay.

Depth to the C horizon ranges from 32 to 50 inches. The horizon is clayey shale or partly weathered clayey or silty redbeds. It is weak red, red, or reddish brown.

Stamford clay, 1 to 3 percent slopes (StB).—This gently sloping soil is on smooth, concave foot slopes. Areas

Representative profile of Tarrant cobbly clay in range, in an area of Tarrant association, undulating, 0.9 mile south on Farm Road 1085 from junction with Santa Fe Railroad, 1.5 miles west-southwest on ranch road to television tower, and 1 mile west and 0.25 mile north:

consists of limestone that in places is interbedded with whitish marl or clayey shale.

Tarrant association, undulating (TAD).—The soils of this association formed over limestone and caliche (fig. 7) on undulating relief. Slopes are complex. They are mainly about 5 percent but range from 1 to 8 percent. Areas of the

Tarrant-Kavett association, undulating (TED).—The soils of this association formed over limestone and marl on undulating relief. Slopes are complex. Slopes on Tarrant soils are mainly about 5 percent but range from 1 to 8 percent. Kavett soils have slopes of less than 3 percent. Areas of this association are long, narrow, and irregularly shaped. They follow contours of the soil slope and are 25 to 300 acres in size.

This mapping unit is more variable than most others in the county, but mapping has been controlled well enough that the variation does not affect anticipated uses.

This association is about 54 percent Tarrant soil, 29 percent Kavett soil, and 17 percent included soils. The Tarrant soil in this association has a surface layer of dark grayish-brown cobbly clay about 6 inches thick. This layer is about 25 percent limestone fragments of cobble size, 5 percent stone size, and 5 percent pebble size. The next layer is dark-brown, firm very cobbly clay about 7 inches thick. It is about 50 percent limestone fragments of cobble size, 5 percent stone size, and 5 percent pebble size. This layer rests abruptly on fractured limestone. The Kavett soil in this association has a surface layer of very dark grayish-brown clay about 8 inches thick. A few stones are on the surface. The next layer is dark-brown, firm clay about 10 inches thick. This layer rests abruptly on fractured limestone that is coated with secondary calcium carbonate.

Included with these soils in mapping are areas of Mereta, Rowena, and Valera soils. Mereta soils are at the higher elevations, mostly on ridges and knolls. Rowena and Valera soils are [illegible]

Tarrant-Rock outcrop association, steep (TFG).—The soils of this association formed over limestone and caliche. Slopes range from 20 to 45 percent. Areas are long and irregularly shaped and are along escarpments. The escarpments have changes in elevation of 200 to 700 feet, which occur over horizontal distances of 200 to 1,000 feet (fig. 8).

This mapping unit is more variable than most others in the county, but mapping has been controlled well enough that the variation does not affect anticipated uses.

This association is about 40 percent Tarrant soil, 25 percent Rock outcrop, and 35 percent included soils. The Tarrant soil in this association has a surface layer of very dark grayish-brown cobbly clay about 4 inches thick. It is about 30 percent limestone fragments of cobble size, 10 percent stone size, and 5 percent pebble size. The next layer is dark grayish-brown, firm very cobbly clay about 6 inches thick. This layer is about 40 percent limestone fragments of cobble size, 20 percent stone size, and 5 percent pebble size. This layer rests abrúptly on fractured limestone. The Rock outcrop part of this mapping unit consists of limestone bedrock exposures that are partly covered by boulders, stones, and pebbles. These outcrops are mostly at the higher elevations, but some are present throughout the association.

Included with these soils in mapping are areas of Kavett and Shep soils and areas of a sandy soil that formed over sandstone, a loamy soil that formed over caliche, and a gravelly soil that formed over limestone. Kavett soils are at the higher elevations. Shep soils are on foot slopes. The [illegible]

Figure 8.—**Typical area of Tarrant-Rock outcrop association, steep, in background; deeper Shep soils in foreground.**

thick. It has a few calcium carbonate concretions. The underlying material is red and olive clay and shale that extends to a depth of about 36 inches.

Included with these soils in mapping are areas of Kavett, Owens, and Pitzer soils. Owens and Pitzer soils are on ridgetops, and Kavett soils are at lower elevations below the ridgetops.

The soils of this mapping unit are used for range. Tarrant soil in capability unit VIIs-3 and Low Stony Hills range site; Vernon soil in capability unit VIe-[illegible] and

Permeability is slow in these soils. Internal drainage is slow. The hazard of soil blowing is slight.

The Tillman soils are used for crops and range.

Representative profile of Tillman clay loam, 1 to 3 percent slopes, in a cultivated field, 1.7 miles south-southeast on Farm Road 1235 from junction with Loop 39 and 50 feet west:

Ap—0 to 7 inches, reddish-brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; weak granular structure; hard,

firm, sticky; common clay films; 5 to 10 percent concretions of calcium carbonate; calcareous; moderately alkaline.

The A and B1 horizons range from 5 to 10 inches in thickness. They are reddish brown, brown, or dark brown.

The Bt horizon ranges from 40 to 60 inches in thickness. It is reddish-brown, red, yellowish-red, or dark-red clay to clay loam that is 35 to 50 percent clay.

Depth to the B3&C horizon ranges from 40 to 70 inches or more. This horizon is red, brown, or gray silty clay and silty clay loam to clay. In places it is shaly clay or weakly consolidated shale.

Tillman clay loam, 0 to 1 percent slopes (TmA).—This nearly level soil is on slightly concave uplands. Areas are irregular in shape and range from 100 to 500 acres in size.

This soil has a surface layer of reddish-brown clay loam about 10 inches thick. The next layer is reddish-brown, firm clay about 28 inches thick. The next layer is yellowish-red, firm clay loam about 30 inches thick that contains about 5 percent calcium carbonate. The underlying material, which extends to a depth of about 92 inches, is red clay stratified with greenish-gray shale.

Included with this soil in mapping are small areas of Sagerton, Stamford, Tobosa, and Vernon soils. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for crops. A few areas are used for range. Capability unit IIs-1; Clay Loam range site.

Tillman clay loam, 1 to 3 percent slopes (TmB).—This gently sloping soil is on slightly convex uplands. Areas are irregular in shape and range from 100 acres to 300 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Sagerton, Stamford, Tobosa, and Vernon soils. Also included are areas of a soil that is similar to this Tillman soil but is calcareous throughout the profile. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for crops. A few areas are used for range. Capability unit IIe-1; Clay Loam range site.

Tobosa Series

The Tobosa series consists of deep, nearly level to gently sloping, well-drained, clayey soils on uplands. These soils formed in calcareous clayey sediment.

In a representative profile the upper 10 inches of the surface layer is dark-brown clay. The next 26 inches of the surface layer is brown, firm clay. The next layer is brown, very firm clay about 22 inches thick. The underlying material is pink silty clay that extends to a depth of about 72 inches and contains calcium carbonate.

Permeability is very slow in these soils. Internal drainage is very slow. Water enters rapidly through cracks in the soils when they are dry. The hazard of soil blowing is slight.

The Tobosa soils are used for crops and range.

Representative profile of Tobosa clay, 0 to 1 percent slopes, in a cultivated field, 1.7 miles north on Farm Road 1750 from junction with Farm Road 707 and 528 feet west:

Ap—0 to 10 inches, dark-brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; weak, fine, granular structure; hard, friable, sticky; calcareous; moderately alkaline; abrupt, smooth boundary.

A1—10 to 36 inches, brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; evident slickensides and moderate, very fine, angular blocky structure; hard, firm, sticky; few fine roots; calcareous; moderately alkaline; gradual, smooth boundary.

AC—36 to 58 inches, brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; evident slickensides and moderate, very fine, blocky structure; very hard, very firm, sticky; about 2 to 5 percent soft and hard segregations of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

Cca—58 to 72 inches, pink (7.5YR 8/4) silty clay, reddish yellow (7.5YR 7/6) moist; massive; very hard, very firm; sticky; about 50 percent, by volume, calcium carbonate; calcareous; moderately alkaline.

The A horizon ranges from 10 to 40 inches in thickness. It is dark brown, dark grayish brown, or brown. This horizon is noncalcareous to calcareous and mildly alkaline to moderately alkaline.

The AC horizon ranges from 10 to 40 inches in thickness. It is brown, dark-brown, or light-brown clay or silty clay that is 45 to 55 percent clay.

Depth to the Cca horizon ranges from 40 to 60 inches or more. This horizon is reddish-yellow, pink, white, or pale-brown silty clay or clay.

Tobosa clay, 0 to 1 percent slopes (ToA).—This nearly level soil is in slightly concave areas in the uplands. Areas are irregular in shape and range from 25 to 1,000 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Rotan, Rowena, Tillman, and Valera soils. A few areas are dissected by shallow creeks or drainageways less than 40 feet wide. These included soils make up less than 15 percent of the mapped acreage of this soil.

About half the acreage of this soil is used for crops and pasture. The rest is used for range. Capability unit IIIs-1; Clay Flat range site.

Tobosa clay, 1 to 3 percent slopes (ToB).—This gently sloping soil is in slightly concave areas in the uplands. Areas are irregular in shape and range from 25 to 200 acres in size.

This soil has a surface layer of dark grayish-brown clay about 6 inches thick. The next layer is dark-brown, firm clay about 9 inches thick. The next layer is dark-brown, firm clay about 40 inches thick. The underlying material is pale-brown, firm clay that contains about 8 percent segregated lumps of calcium carbonate and extends to a depth of about 72 inches.

Included with this soil in mapping are small areas of Kavett, Rotan, Rowena, and Valera soils. Also included are a few areas that are dissected by shallow creeks or drainageways less than 40 feet wide. These included soils make up less than 15 percent of the mapped acreage of this soil.

About half the acreage of this soil is used for crops and pasture. The rest is used for range. Capability unit IIIe-3; Clay Flat range site.

Tobosa-Urban land complex, 0 to 3 percent slopes (TuB).—This complex is on nearly level to gently sloping uplands within the metropolitan areas of Abilene and the Dyess Air Force Base. About 50 percent of the complex is Tobosa clay, 35 percent is Urban land, and 15 percent is included soils of the Mereta, Rotan, and Valera series.

Tobosa soils have a surface layer of dark grayish-brown clay about 6 inches thick. The next layer is dark grayish-brown, firm clay about 16 inches thick. The next layer is brown, firm clay about 28 inches thick. The underlying

material is pale-brown, firm clay that contains about 10 percent segregated lumps of calcium carbonate and extends to a depth of about 70 inches.

Urban land consists of works and structures, such as streets, sidewalks, buildings, driveways, and patios. Most of these structures are single-unit dwellings. Much of the soil has been altered by excavations or has been covered with contrasting soil material. The more sloping parts of this unit are cut or filled to a depth of 1 foot to 3 feet, depending on slope.

[redacted]

Ustochrepts and Rock outcrop, hilly (URF).—This mapping unit is in irregularly shaped areas that are 50 to 800 acres in size. The areas consist of rough and gullied side slopes of intermittent drainageways. Gullies are 300 to 500 feet apart, 1 to 15 feet deep, and steep walled. The Rock outcrop part of this mapping unit consists of areas of sandstone that ranges from weakly cemented to indurated. It is on benches or is steep. Slopes are complex. They range from 10 to 30 percent but average about 15 percent. Some soils in rough broken areas have slopes near 100 percent, and some on small benches have slopes of about 5 percent.

blocky structure; very hard, firm, sticky; about 15 percent visible calcium carbonate; calcareous; moderately alkaline; abrupt, wavy boundary.

R—34 to 35 inches, fractured indurated limestone that has a thin laminar coating of hard caliche.

The A horizon ranges from 15 to 36 inches in thickness. It is dark grayish-brown, very dark grayish-brown, brown, to dark-brown clay, silty clay, silty clay loam, or clay loam.

The B2 horizon ranges from 4 to 18 inches in thickness. It is very pale brown, grayish-brown, dark-brown, or brown clay or silty clay. A zone of calcium carbonate occurs in the lower 5 inches of the B2 horizon. It is brown, pale brown, dark brown, or white and contains 15 to 50 percent visible calcium carbonate.

Depth to the R layer ranges from 20 to 40 inches or more. The calcium carbonate that coats the limestone in this horizon is hard and cannot be dug with a spade. The calcium carbonate coatings range from 2 millimeters to 20 millimeters in thickness.

Valera clay, 0 to 1 percent slopes (VaA).—This nearly level soil is on slightly convex uplands. Areas are irregular in shape and range from 10 to 200 acres in size.

This soil has a surface layer of dark grayish-brown clay about 30 inches thick. The next layer is very pale brown, firm silty clay about 4 inches thick that contains about 20 percent calcium carbonate. This layer rests abruptly on fractured limestone.

Included with this soil in mapping are small areas of Kavett, Rowena, and Tobosa soils. Also included are a few areas of soils that are noncalcareous in the upper part. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for range. A few are used for crops. Capability unit IIs-1; Clay Loam range site.

Valera clay, 1 to 3 percent slopes (VaB).—This gently sloping soil is on slightly concave and convex uplands. Areas are irregular in shape and range from 10 to 200 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Kavett, Rowena, and Tobosa soils. These included soils make up less than 15 percent of the mapped acreage of this soil.

Most areas of this soil are used for range. A few areas are used for crops. Capability unit IIe-1; Clay Loam range site.

Vernon Series

The Vernon series consists of moderately deep, gently sloping to strongly sloping, well-drained, clayey soils on uplands. These soils formed in calcareous clayey shale.

In a representative profile the surface layer is red clay about 6 inches thick. The next layer is red, extremely firm subangular blocky and granular; very hard, firm, sticky; few worm casts; few siliceous pebbles, about 2 to 5 millimeters in diameter; calcareous; moderately alkaline; clear, smooth boundary.

B2—6 to 30 inches, red (2.5YR 5/6) silty clay, red (2.5YR 4/6) moist; weak, medium, blocky structure parting to moderate, very fine, subangular blocky; extremely hard, extremely firm, sticky; few worm casts; common fine roots; few siliceous pebbles; about 3 percent fine to medium soft masses and concretions of segregated calcium carbonate, mostly at a depth of 24 to 30 inches; calcareous; moderately alkaline; gradual, wavy boundary.

C1—30 to 34 inches, weak-red (10R 4/4) shale fragments and about 5 percent fine earth in partings; shale fragments tilted and displaced with reference to bedding planes; few roots; calcareous; moderately alkaline; gradual, wavy boundary.

C2—34 to 60 inches, weak-red (10R 4/4) redbed clay shale that has evident bedding planes; a few mottles and thin strata of light-gray (7.5YR 7/0), few thin strata are noncalcareous; calcareous; moderately alkaline; shale can be dug with spade only with difficulty when dry.

The A horizon ranges from 4 to 12 inches in thickness. It is red, reddish-brown, brown, or yellowish-red clay or silty clay to clay loam.

The B2 horizon ranges from 14 to 26 inches in thickness. It is red, reddish-brown, or yellowish-red silty clay or clay that is 35 to 50 percent clay.

Depth to the C horizon ranges from 20 to 36 inches. This horizon is weak-red, red, yellowish-red, olive, or reddish-brown shale fragments and clayey shale.

Vernon clay, 1 to 3 percent slopes (VeB).—This gently sloping soil is on convex upland ridges. Areas are irregular in shape and range from 15 to 50 acres in size.

This soil has a surface layer of reddish-brown clay about 6 inches thick. The next layer is red, firm clay about 24 inches thick that contains a few fine to medium concretions of calcium carbonate. The underlying material, which extends to a depth of about 60 inches, is weak-red clayey sediment that has bluish streaks.

Included with this soil in mapping are small areas of Owens, Pitzer, Stamford, and Weymouth soils. These included soils make up less than 15 percent of the mapped acreage of this soil.

These soils are used mostly for range. A few areas are used for crops. Capability unit IVe-1; Shallow Clay range site.

Vernon clay, 3 to 12 percent slopes (VeE).—This gently sloping to strongly sloping soil is on uplands, knolls, and ridges. Areas are irregular in shape and range from 20 to 200 acres in size. Slopes are complex. They average about 10 percent. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Owens, Pitzer, Stamford, and Weymouth soils. These in-

contains fine to medium masses and concretions of calcium carbonate in the lower part. The underlying material

Included with this soil in mapping are small areas of Pitzer and Vernon soils. Also included are areas of a soil

intensity and short duration, and a general rain for the area is not common. Approximately 75 percent of the precipitation falls during the months of April through October. May, June, and October receive the most and

them unsuited to cultivation and restrict their use largely to pasture, range, woodland, or wildlife habitat. Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their

This soil is used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on this soil is one that includes wheat, grain sorghum, or a similar high-residue crop. Crop residue left on or near the surface helps conserve moisture and prevent soil blowing. Terraces and contour farming help reduce runoff and conserve moisture. Diversion terraces are needed in places to protect the soils from runoff from higher areas. Grassed waterways are needed where flow of water concentrates.

CAPABILITY UNIT IIe-3

This unit consists of deep, moderately permeable to moderately slowly permeable fine sandy loams. Available water capacity is medium to high.

These soils are used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on these soils is one that includes wheat, grain sorghum, or a similar high-residue crop. Crop residue left on or near the surface helps conserve moisture, maintain good tilth, and prevent soil blowing. Terraces help reduce runoff and conserve moisture. If crop residue is not available, emergency tillage helps control soil blowing.

CAPABILITY UNIT IIs-1

[redacted]

good tilth. Diversion terraces are needed in some areas to protect the soils from runoff from higher areas.

CAPABILITY UNIT IIIe-1

Miles fine sandy loam, 1 to 3 percent slopes, the only soil in this unit, is a deep, moderately permeable soil. Available water capacity is medium.

This soil is used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on this soil is one that includes wheat, grain sorghum, or a similar high-residue crop. Crop residue left on or near the surface helps conserve moisture, prevent soil blowing, and maintain good tilth. Terraces and contour farming help prevent water erosion and conserve moisture. If crop residue is not available, emergency tillage helps control soil blowing. Grassed waterways are needed where flow of water concentrates.

CAPABILITY UNIT IIIe-2

Shep loam, 1 to 3 percent slopes, the only soil in this unit, is a deep, moderately permeable soil. Available water capacity is high.

This soil is used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on this soil is one that includes wheat, grain sorghum, or a similar high-residue

CAPABILITY UNIT IIIe-5

Cosh fine sandy loam, 1 to 3 percent slopes, the only soil in this unit, is a shallow, moderately permeable soil. Available water capacity is low.

This soil is used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on this soil is one that includes wheat, grain sorghum, or a similar high-residue crop. Crop residue left on or near the surface helps prevent soil blowing, conserve moisture, and maintain good tilth. Terraces and contour farming help reduce runoff and conserve moisture. Grassed waterways are needed where flow of water concentrates.

CAPABILITY UNIT IIIe-6

This unit consists of deep, moderately slowly permeable fine sands and loamy fine sands. Available water capacity is medium to high.

These soils are used for crops and range. Cotton, grain

A suitable cropping system on these soils is one that includes grain sorghum, wheat, or a similar high-residue crop. Crop residue left on or near the surface helps con-

cludes wheat, grain sorghum, or a similar high-residue crop. Crop residue left on or near the surface helps conserve moisture, prevent soil blowing, and maintain good tilth. Terraces and contour farming help prevent water erosion and conserve moisture. Grassed waterways are needed where flow of water concentrates.

CAPABILITY UNIT IIIs-2

This unit consists of shallow, moderately slowly permeable to slowly permeable clays and clay loams. Available water capacity is low.

These soils are used for crops and range. Cotton, grain sorghum, and wheat are the main crops.

A suitable cropping system on these soils is one that includes grain sorghum or a similar high-residue crop. Crop residue left on or near the surface helps conserve moisture and maintain good tilth. Terraces and contour farming help prevent water erosion and conserve moisture. Grassed waterways are needed where flow of water concentrates.

This unit consists of deep to shallow, moderately permeable to very slowly permeable clays, clay loams, and

water from adjacent land, and it swells when wet and cracks when dry. Water stands on the surface for several months during most years.

CAPABILITY UNIT VIs-1

This unit consists of moderately deep to very shallow, slopes in the county and is generally used on the more sandy soils.

Yields under irrigation can be expected to be higher than those under nonirrigated farming. More information about irrigation can be obtained from representatives of the Soil Conservation Service who serve the Middle Clear [illegible]

TABLE 2.—*Estimated average yields per acre of principal crops grown under a high level of management*

[redacted]

Range sites and condition classes

Different kinds of soil vary in their capacity to produce [redacted]

manager, may have a degraded appearance that temporarily conceals its quality and ability to recover.

Descriptions of range sites

In the following pages the range sites of Taylor County are described, and the climax plants and principal invaders on the sites are named. The descriptions also contain an estimate of the potential annual yield of air-dry herbage for each site when it is in excellent condition.

CLAY LOAM RANGE SITE

This range site consists of deep to moderately deep clay loams and clays.

Permeability is moderately slow to slow. The hazard of soil blowing is slight. If the vegetative stand deteriorates, surface crusting becomes a problem.

The climax plant community on this site consists of short and mid grasses (fig. 9).

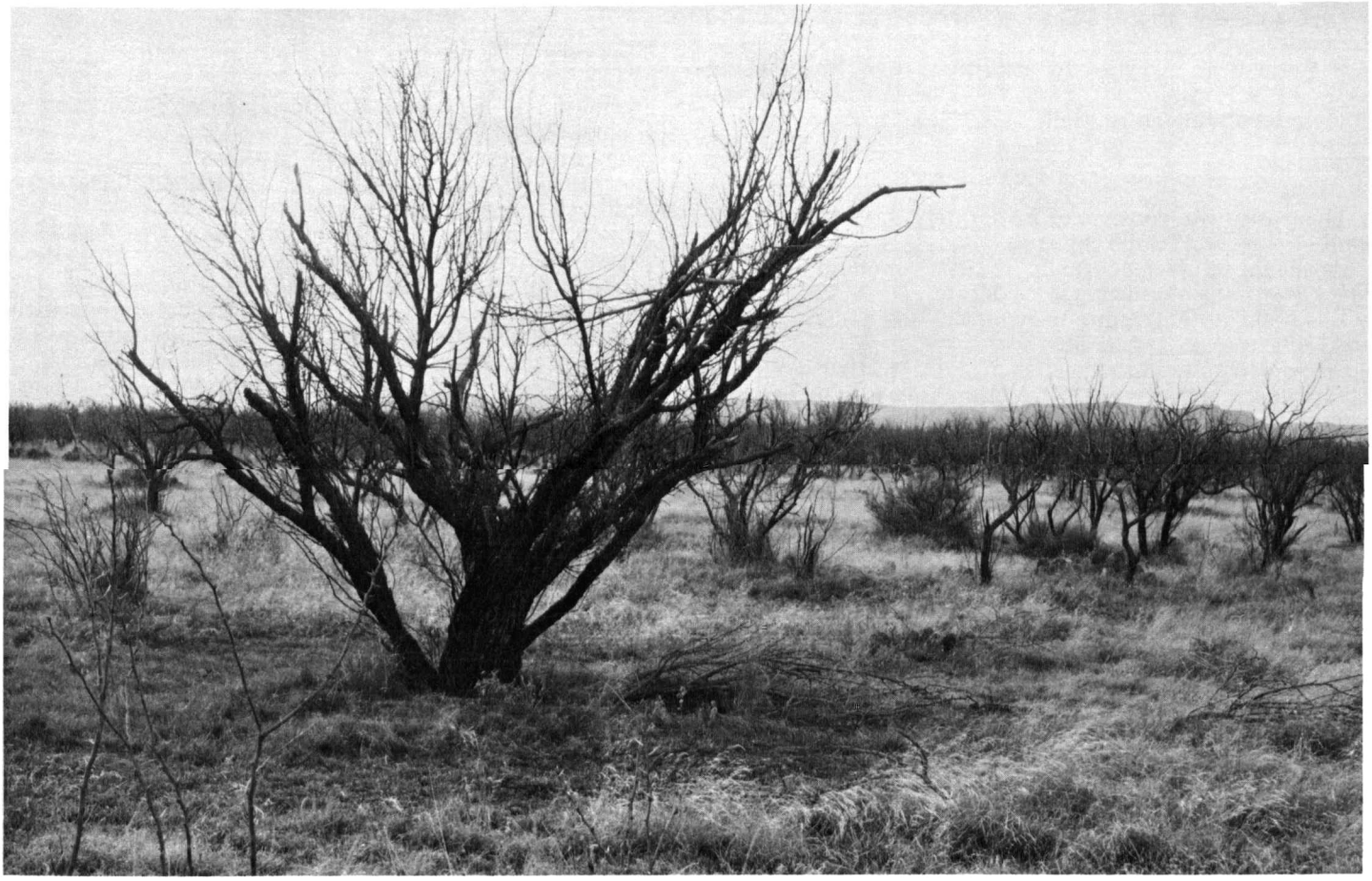


Figure 9.—**Area of Clay Loam range site. The soil is Sagerton clay loam, 0 to 1 percent slopes.**

Arizona cottontop, vine-mesquite, Texas wintergrass, Texas cupgrass, and forbs; and 15 percent woody species.

Continued heavy grazing of this site results in a decrease of the tall grasses and an increase in side-oats grama, little bluestem, buffalograss, Texas wintergrass, hairy tridens, and slim tridens. Redberry juniper, tasajillo, and condalia species are woody invaders.

If this site is in excellent condition, it produces about 900 to 1,700 pounds of air-dry herbage per acre annually, depending on rainfall.

REDLAND RANGE SITE

This range site consists of shallow clay loams.

Permeability is slow. The hazard of soil blowing is slight.

The climax plant community on this site consists of a live oak savannah, scattered post oak, and an understory of tall and mild grasses.

Where this site is in excellent condition, the vegetation is, by weight, about 20 percent little bluestem; 15 percent [illegible]

Texas wintergrass, meadow dropseed, and buffalograss. Further deterioration results in a woody overstory of oaks and an understory of Texas wintergrass, buffalograss, and annuals.

If this site is in excellent condition, it produces about 2,000 to 3,500 pounds of air-dry herbage per acre annually, depending on rainfall.

SANDY RANGE SITE

This range site consists of deep fine sands and loamy fine sands.

Permeability is moderately slow. The hazard of soil blowing is moderate to severe.

The climax plant community on this site consists of a savannah of post oak and blackjack oak. Post oak is the dominant woody species.

Where this site is in excellent condition, the vegetation is, by weight, about 25 percent little bluestem; 10 percent each big bluestem and indiangrass; 5 percent each sand lovegrass, purpletop tridens, tall dropseed, silver [illegible]

to such a density that only shade-tolerant plants survive in the understory.

If this site is in excellent condition, it produces about 2,000 to 4,000 pounds of air-dry herbage per acre annually, depending on rainfall.

SANDY LOAM RANGE SITE

This range site consists of moderately deep to deep fine sandy loams and loams (fig. 10).

Permeability is moderately rapid to moderately slow. The hazard of soil blowing is moderate.

The climax plant community on this site consists of mid and tall grass-oak savannah.

Where this site is in excellent condition, the vegetation is, by weight, 30 percent little bluestem; 20 percent side-oats grama; 10 percent each of indiangrass and plains bristlegrass; 5 percent each of Arizona cottontop, sand bluestem, purple and wright three-awn, and forbs; and 10 percent woody species.

Continued heavy grazing of this site results in a decrease of the tall and mid grasses and an increase in buffalograss

SHALLOW RANGE SITE

This range site consists of shallow clays and clay loams (fig. 11).

Permeability is slow to moderately slow. The hazard of soil blowing is slight.

The climax plant community on this site consists of an open prairie of mid grasses and scattered hackberry, skunkbush sumac, bumelia, and catclaw.

Where this site is in excellent condition, the vegetation is, by weight, about 20 percent side-oats grama; 15 percent vine-mesquite; 10 percent each of Texas wintergrass and forbs; and 5 percent each of Arizona cottontop, little bluestem, silver bluestem, big bluestem, indiangrass, blue grama, Texas cupgrass, buffalograss, and woody species.

Continued heavy grazing of this site results in a decrease of side-oats grama and an increase in Texas wintergrass and buffalograss. The scattered tall grasses die out. Further deterioration results in a plant community of buffalograss, mesquite, pricklypear, tasajillo, condalia, hairy grama, hairy tridens, Texas grama, and red grama.

If this site is in excellent condition, it produces about

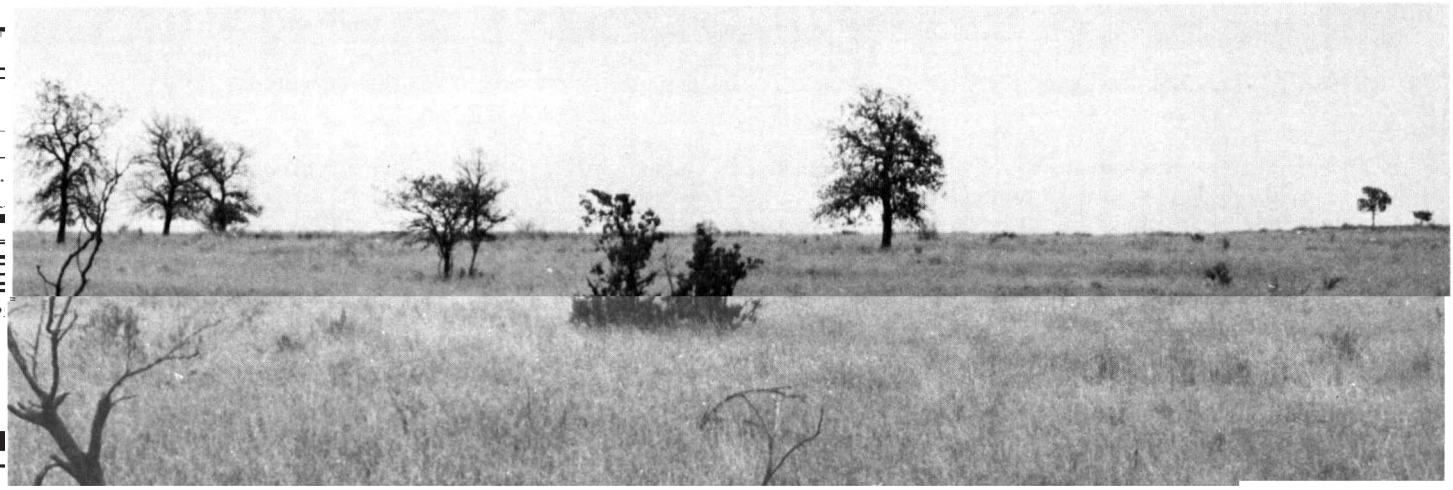


Figure 11.—Area of Shallow range site. The soil is Kavett clay, 0 to 1 percent slopes.

Permeability is very slow. The hazard of soil blowing is slight.

The climax plant community on this site consists of short and mid grasses.

Where this site is in excellent condition, the vegetation is, by weight, about 40 percent side-oats grama; 10 percent each of buffalograss, vine-mesquite, and Arizona cottontop; and 5 percent each of Texas wintergrass, silver bluestem, rough tridens, blue grama, woody species, and forbs.

Continued heavy grazing of this site results in a decrease of side-oats grama and an increase in buffalograss. Further deterioration results in a decrease of buffalograss and an increase in hairy tridens, sandy muhly, Texas grama, pricklypear, mesquite, juniper, and condalia.

If this site is in excellent condition, it produces about 800 to 1,700 pounds of air-dry herbage per acre annually, depending on rainfall.

Revegetation is difficult as a result because the soils are shallow and droughty.

STEEP ROCKY RANGE SITE

site produce denser stands of vegetation because they receive less direct sunlight.

Where this site is in excellent condition, the vegetation is, by weight, about 15 percent side-oats grama; 10 percent each of big bluestem, indiangrass, little bluestem, and switchgrass; 5 percent each of green sprangletop, vine-mesquite, Arizona cottontop, Texas wintergrass, Texas cupgrass, and forbs; and 15 percent woody species.

Continued heavy grazing of this site results in a decrease of the tall grasses and an increase in little bluestem, side-oats grama, and cane bluestem. Further deterioration results in a plant community of buffalograss, Texas wintergrass, slim tridens, hairy grama, and three-awn.

If this site is in excellent condition, it produces about 900 to 1,700 pounds of air-dry herbage per acre annually, depending on rainfall.

Cattle use this site very little because the soils are steep. Deer and other wildlife species frequently use the site for cover.

VERY SHALLOW RANGE SITE

Figure 12.—**Area of Steep Rocky range site. Tarrant-Rock outcrop association, steep, is in the background.**

[redacted] mon predators in Taylor County are coyotes, bobcats, and

Successful management of wildlife on any tract of land requires, among other things, that food, cover, and water be available in a suitable combination. Lack of any one of these necessities, an unfavorable balance among them, or inadequate distribution of them may severely limit or account for the absence of desired wildlife species. Information about the soil provides a valuable tool in creating, improving, or maintaining suitable food, cover, and water for wildlife.

Soils directly influence the kinds and amounts of vegetation and the amount of water available and, in this way, indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the growth of wildlife

Shrubs are plants that produce wildlife food in the form of twigs, bark, buds, or foliage. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical species are bitterbrush, snowberry, sagebrush, mesquite, catsclaw, gray oak, and whitebrush.

Three other elements of wildlife habitat, coniferous woody plants, wetland food and cover plants, and shallow-water developments, are not covered in the table. All the soils in Taylor County are poor or very poor for coniferous woody plants except Kavett and Tarrant soils, which are fair; and Pitzer soils, which are good. All the soils are very poor for wetland food and cover plants except Randall

TABLE 3.—*Suitability of soils for elements of wildlife habitat and kinds of wildlife*

Soil series and map symbols	Elements of wildlife habitat				Kinds of wildlife	

TABLE 3.—*Suitability of soils for elements of wildlife habitat and kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat				Kinds of wildlife	
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Shrubs	Openland	Rangeland
Sagerton: SaA, SaB, SeB. For Urban land part of SeB, see Urban land.	Good	Good	Good	Fair	Good	Fair.
Shep: ShB, ShC, ShD	Fair	Good	Good	Good	Good	Good.
Speck: SpA, SpB	Poor	Poor	Fair	Fair	Poor	Fair.
Stamford: StB	Fair	Fair	Fair	Fair	Fair	Fair.
Tarrant: TAD, TED, TFF, TFG, TLD. For Kavett part of TED, see Kavett series. For Rock outcrop part of TFF and TFG, see Rock outcrop. For Vernon part of TLD, see Vernon series.	Very poor	Very poor	Poor	Fair	Very poor	Poor.
Tillman: TmA, TmB	Good	Good	Good	Poor	Good	Fair.
Tobosa: ToA, ToB, TuB. For Urban land part of TuB, see Urban land.	Fair	Fair	Fair	Fair	Fair	Fair.
Urban land: Ub	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor.
Ustochrepts: URF. For Rock outcrop part, see Rock outcrop.	Fair	Good	Good	Fair	Good	Fair.
Valera: VaA, VaB	Fair	Fair	Fair	Fair	Fair	Fair.
Vernon: VeB, VeE	Fair	Fair	Fair	Fair	Fair	Fair.
Weymouth: WeB, WeC, WuD. For Urban land part of WuD, see Urban land.	Fair	Good	Good	Good	Good	Good.

are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.

6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 4, 5, and 6, which show, respectively, several estimated soil properties significant in engineering; interpretations for various engineering uses; and results of engineering laboratory tests on soil samples.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those in tables 4, 5, and 6, and it can also be used to make other useful maps.

This information, however, does not eliminate the need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths of more than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning to soil scientists that is not known to all engineers. The Glossary defines many of these terms as they are commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system[7] used by the Soil Conservation Service, Department of Defense, and other agencies, and the AASHO system[8]

[7] United States Department of Defense. Unified soil classification system for roads, airfields, embankments and foundations. MIL-STD-619B, 30 pp., illus. 1968.

[8] American Association of State Highway Officials. Standard specifications for highway materials and methods of sampling and testing. Ed. 8, 2 v., illus. 1961.

TABLE 4.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such other series that appear in the first column of this table. The

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface (typical profile)	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHO	
		Inches	*Inches*				
Badland. Too variable to be rated. Mapped only in a complex with Owens soils.							
*Clairemont: Ca, Cn. For Urban land part of Cn, see Urban land.	B	>60	0–30	Silty clay loam	CL	A-6, A-7	
			30–60	Silt loam	CL	A-6, A-7	
Cobb: CoB	B	20–40	0–7	Fine sandy loam	SM, SM-SC	A-2, A-4	
			7–33	Sandy clay loam	SC or CL	A-6	
			33	Weakly cemented sandstone.			
Colorado: Cr	B	>60	0–60	Loam, clay loam	ML or CL, ML-CL	A-4, A-6	
Cosh: CsB	C	12–20	0–7	Fine sandy loam	SM, SM-SC	A-4	
			7–18	Sandy clay loam	SC or CL	A-6	
			18	Weakly cemented sandstone.			
Demona variant: DeB	C	>80	0–22	Fine sand	SM	A-2-4	
			22–52	Sandy clay	CL, CH	A-7	
			52–80	Sandy clay loam	SC	A-6, A-4	
Gageby: Ga	B	>80	0–7	Clay loam	CL	A-6	
			7–80	Sandy clay loam	CL	A-6, A-4	
*Hamby: HaB, HbA, HbB, HbC, HuB. For Urban land part of HuB, see Urban land.	C	>83	0–10	Fine sandy loam and loamy fine sand.	SM, SM-SC	A-4, A-2	
			10–66	Clay	CL, SC	A-7, A-6	
			66–83	Clay loam	CL, SC	A-6, A-7	
Kavett: KaA, KaB	D	12–20	0–15	Clay	CH	A-7	
			15	Fractured limestone plates.			
*Mangum: Ma, Mb, Mf. For Urban land part of Mb, see Urban land.	D	>81	0–9	Silt loam, silty clay, silty clay loam, clay.	CL	A-7-6, A-6	
			9–54	Silty clay	CH, CL	A-7-6	
			54–81	Clay	CH, CL	A-7	
Mereta: MrA, MrB, MrC	C	14–20	0–18	Clay loam	CL	A-6 or A-7-6	
			18–22	Strongly cemented caliche.			
			22–30	Clay loam	CL	A-6, A-7	
Miles: MsA, MsB, MsC	B	>80	0–9	Fine sandy loam	SM, SM-SC	A-2 or A-4	
			9–80	Sandy clay loam	SC or CL	A-6	
*Owens: ObE. For Badland part, see Badland.	D	12–20	0–16	Clay	CH, CL	A-7-6	
			16–24	Shaly clay.			
*Pitzer: PtD, PuD, PwC. For Urban land part of PuD, see Urban land. For Weymouth part of PwC, see Weymouth series.	C	4–14	0–6	Gravelly loam	CL, ML-CL	A-4, A-6	0–3
			6–20	Indurated caliche			
			20–76	Very gravelly sandy loam.	GM-GC, GC, GW-GC	A-1-b, A-2	0–10
			76–80	Clayey shale.			

significant to engineering

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to symbol > means more than, and the symbol < means less than]

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
						Inches per hour	*Inches per inch of soil*	*pH*			
100	100	100	85–98	30–45	11–25	0.6–2.0	0.16–0.19	7.4–8.4	Low	Low	Low.
100	100	100	85–98	30–45	11–25	0.6–2.0	0.16–0.18	7.9–8.4	Low	Low	Low.
100	98–100	75–90	30–50	18–25	1–5	2.0–6.0	0.11–0.14	6.1–7.3	Low	Low	Low.
95–100	90–99	90–98	40–60	25–36	12–20	0.6–2.0	0.12–0.16	6.1–7.3	Low	Low	Low.
100	100	100	85–98	20–40	5–20	0.6–2.0	0.16–0.20	7.9–8.4	Low	High	Low.
95–100	90–100	70–85	40–50	18–25	1–5	2.0–6.0	0.11–0.13	6.1–7.3	Very low	Low	Low.
90–98	90–98	90–98	40–55	25–36	12–20	0.6–2.0	0.12–0.15	6.1–7.8	Low	Low	Low.
100	100	65–80	20–30	<20	[1] NP–3	2.0–6.0	0.05–0.08	6.1–7.3	Very low	Low	Low.

TABLE 4.—*Estimated soil properties*

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface (typical profile)	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHO	
		Inches	*Inches*				
Quanah: QaB, QaC	B	>72	0–32	Clay loam	CL	A-6	
			32–60	Sandy clay loam	CL	A-6, A-4	
			60–72	Stratified loamy sediments.			
Randall: Ra	D	>90	0–90	Clay	CH, CL	A-7-6	
Rioconcho: Rc, Rf	C	>80	0–80	Clay loam, clay, silty clay loam, silty clay.	CL	A-6 or A-7	0–10
Rock outcrop. Too variable to be rated. Extensive onsite examination required. Mapped in an undifferentiated unit with Ustochrepts and in associations with Tarrant soils.							
Rotan: RnA, RnB	C	>80	0–14	Clay loam	CL	A-6, A-4	
			14–48	Clay	CL, CH	A-7-6	
			48–80	Clay loam	CL	A-7-6, A-6	
*Rowena: RoA, RoB, RuA. For Urban land part of RuA, see Urban land.	C	>64	0–6	Clay loam	CL	A-7, A-6	
			6–24	Clay	CH or CL	A-7, A-6	
			24–64	Clay	CH or CL	A-7, A-6	
*Sagerton: SaA, SaB, SeB. For Urban land part of SeB, see Urban land.	C	>80	0–11	Clay loam	CL	A-6, A-4	
			11–33	Clay	CL	A-6 or A-7	
			33–80	Clay loam	CL	A-6	
Shep: ShB, ShC, ShD	B	>80	0–25	Loam	CL or SC, SM, ML	A-4 or A-6	
			25–80	Sandy clay loam	CL or SC, SM, ML	A-4 or A-6	
Speck: SpA, SpB	D	14–20	0–7	Clay loam	CL	A-6 or A-7-6	
			7–19	Clay	CL or CH	A-7-6	
			19	Indurated fractured limestone.			
Stamford: StB	D	>100	0–13	Clay	CH	A-7-6	
			13–48	Silty clay	CH	A-7-6	
			48–100	Clayey shale.			
*Tarrant: TAD, TED, TFF, TFG, TLD. For Kavett part of TED, see Kavett series. For Rock outcrop part of TFF and TFG, see Rock outcrop. For Vernon part of TLD, see Vernon series.	D	6–20	0–15	Cobbly clay, very cobbly clay.	CH or MH	A-7-5 or A-7-6	15–50
			15	Fractured limestone.			
Tillman: TmA, TmB	C	>72	0–10	Clay loam	CL	A-6 or A-7-6	
			10–64	Clay	CH, CL	A-7-6	
			64–72	Silty clay	CL or CH	A-6, A-7-6	0–5
*Tobosa: ToA, ToB, TuB. For Urban land part of TuB, see Urban land.	D	>72	0–58	Clay	CH	A-7-6	0–5
			58–72	Silty clay	CH, CL	A-7-6	0–5
Urban land: Ub. Too variable to be rated.							
*Ustochrepts: URF. Too variable to be rated. For Rock outcrop part, see Rock outcrop.							

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
						Inches per hour	*Inches per inch of soil*	*pH*			
100	95–100	95–98	85–95	30–40	12–18	0.6–2.0	0.15–0.18	7.9–8.4	Low	Moderate	Low.
100	90–95	85–90	75–85	25–35	8–15	0.6–2.0	0.13–0.16	7.9–8.4	Low	Moderate	Low.
100	100	96–100	60–98	41–65	20–40	<0.06	0.14–0.18	7.4–8.4	High	Very high	Low.
95–100	95–100	75–100	70–95	35–50	15–30	0.06–0.20	0.15–0.20	7.4–8.4	High	High	Low.
100	100	95–99	70–85	20–30	8–12	0.6–2.0	0.15–0.19	7.4–8.4	Moderate	Moderate	Low.
100	95–100	95–99	80–95	45–55	20–31	0.2–0.6	0.14–0.18	7.4–8.4	High	High	Low.
85–100	80–100	74–95	54–92	35–50	15–30	0.2–0.6	0.12–0.15	7.4–8.4	Moderate	Moderate	Low.
100	100	85–100	70–80	35–50	15–30	0.2–0.6	0.15–0.20	7.9–8.4	Moderate	Moderate	Low.
95–100	95–100	90–100	75–95	38–55	21–35	0.2–0.6	0.14–0.18	7.9–8.4	High	High	Low.
95–100	95–100	90–100	68–80	34–55	15–30	0.2–0.6	0.12–0.15	7.9–8.4	High	High	Low.
95–100	95–100	90–100	60–90	25–35	8–17	0.2–0.6	0.15–0.20	6.6–7.8	Low	Moderate	Low.
100	100	90–100	85–90	35–50	20–30	0.2–0.6	0.15–0.18	7.4–8.4	Moderate	High	Low.
100	100	75–90	70–75	25–40	12–25	0.2–0.6	0.10–0.15	7.9–8.4	Low	Moderate	Low.
85–100	85–100	75–95	40–75	25–35	8–15	0.6–2.0	0.15–0.19	7.9–8.4	Low	High	Low.
85–100	80–100	75–95	40–75	25–35	8–20	0.6–2.0	0.13–0.17	7.9–8.4	Low	High	Low.
90–100	90–100	80–95	75–90	30–45	15–25	0.2–0.6	0.15–0.20	6.1–7.8	Low	Moderate	Low.
75–95	75–95	75–95	60–95	45–55	25–35	0.06–0.20	0.15–0.18	7.4–7.8	Moderate	High	Low.
100	100	95–100	80–95	51–80	30–50	<0.06	0.14–0.17	7.9–8.4	Very high	High	Low.
100	100	95–100	90–95	51–70	30–44	<0.06	0.15–0.17	7.9–8.4	High	High	Low.
80–100	80–100	70–90	70–95	55–70	30–40	0.2–0.6	0.15–0.17	7.9–8.4	High	High	Low.
100	100	90–98	70–80	35–48	15–30	0.2–0.6	0.16–0.20	7.4–7.8	Moderate	Moderate	Low.
100	100	90–98	75–95	41–55	20–30	0.06–0.20	0.14–0.18	7.9–8.4	High	High	Low.
90–100	85–100	80–90	60–95	35–52	15–30	0.06–0.20	0.13–0.17	7.9–8.4	Moderate	High	Low.
98–100	95–100	90–100	75–95	51–70	30–45	<0.06	0.12–0.18	7.4–8.4	Very high	High	Low.

TABLE 4.—*Estimated soil properties*

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface (typical profile)	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHO	
		Inches	*Inches*				
Valera: VaA, VaB	C	20–40	0–30	Clay	CL or CH	A-7-6	
			30–34	Silty clay	CL or CH	A-7-6	
			34	Fractured indurated limestone.			
Vernon: VeB, VeE	D	20–36	0–6	Clay	CH, CL	A-7-6	
			6–30	Silty clay	CL or CH	A-7-6	
			30–60	Shale, clay shale.			
*Weymouth: WeB, WeC, WuD—For Urban land part of WuD, see Urban land.	B	>42	0–14	Clay loam	CL	A-6	
			14–36	Clay loam	CL	A-6	
			36–42	Clayey shale.			

[1] Nonplastic to plasticity index of 3.

adopted by the American Association of State Highway Officials.

In the Unified Soil Classification System soils are classified according to particle-size distribution, plasticity index, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML-CL.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups that range from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high shear strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a different significance in soil engineering. The estimates are based on field observation made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 4.

Depth to bedrock is distance from the surface of the soil to the upper surface of the rock layer.

Soil texture is described in table 4 in the standard terms used by the Department of Agriculture. These terms take into account the relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added; for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary at the back of this soil survey.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a moist state, the material changes from a semisolid to a

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
						Inches per hour	*Inches per inch of soil*				
98–100	95–100	85–95	80–90	50–61	28–35	0.2–0.6	0.15–0.20	7.9–8.4	High	High	Low.
95–100	95–100	85–95	80–90	41–55	20–32	0.2–0.6	0.15–0.18	7.9–8.4	High	High	Low.
100	100	90–100	80–95	41–60	20–36	<0.06	0.13–0.17	7.9–8.4	High	High	Low.
95–100	95–100	90–95	80–90	48–60	25–35	0.2–0.6	0.14–0.17	7.9–8.4	High	High	Low.
100	95–100	90–100	70–85	30–40	15–25	0.6–2.0	0.16–0.20	7.4–8.4	Low	Moderate	Low.
90–100	95–100	85–95	70–90	30–40	15–25	0.6–2.0	0.13–0.17	7.9–8.4	Low	Moderate	Low.

count lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as

These groupings are based on estimates of the intake of water during the latter part of a storm of long duration. The estimates are of the intake of water in a soil without protective vegetation after the soil profile is wet and has

TABLE 5.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such

Soil series and map symbols	Suitability as a source of—		Degree and kind of limitation for—			
	Topsoil	Road fill	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements
Badland. Too variable to be rated. Mapped only in a complex with Owens soils.						
*Clairemont: Ca, Cn. For Urban land part of Cn, see Urban land.	Fair: silty clay loam.	Fair: fair traffic-supporting capacity.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.
Cobb: CoB	Fair: fine sandy loam, 6 to 10 inches thick.	Fair: fair traffic-supporting capacity.	Severe: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.
Colorado: Cr	Good	Fair: fair traffic-supporting capacity.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.
Cosh: CsB	Poor: fine sandy loam, 4 to 9 inches thick.	Poor: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Moderate: bedrock at depth of 12 to 20 inches.
Demona variant: DeB	Poor: fine sand.	Fair: fair traffic-supporting capacity.	Severe: moderately slow permeability.	Severe: permeable surface layer; seasonal water table at depth of 48 to 72 inches.	Moderate: seasonal water table at depth of 48 to 72 inches.	Moderate: seasonal water table at depth of 48 to 72 inches.
Gageby: Ga	Fair: clay loam.	Fair: fair traffic-supporting capacity.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.
*Hamby: HbA, HbB, HuB. For Urban land part of HuB, see Urban land.	Fair: fine sandy loam, 7 to 18 inches thick.	Fair: moderate shrink-swell potential.	Severe: moderately slow permeability.	Slight	Severe: clayey texture.	Moderate: moderate shrink-swell potential.
HaB	Poor: loamy fine sand.	Fair: moderate shrink-swell	Severe: moderately slow permeability.	Slight	Severe: clayey texture.	Moderate: moderate shrink-swell potential.

interpretations

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to the first column of this table]

Degree and kind of limitation for—Continued				Soil features affecting—		
Sanitary landfill[1]	Local roads and streets	Farm ponds		Irrigation	Terraces and diversions	Waterways
		Reservoir areas	Embankments			
Severe: flood hazard.	Severe: flood hazard.	Moderate: moderate permeability.	Moderate: fair resistance to piping and erosion.	Subject to flooding.	Subject to flooding.	Subject to flooding.
Severe: bedrock at depth of 20 to 40 inches.	Moderate: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Moderate: fair resistance to piping and erosion.	Bedrock at depth of 20 to 40 inches.	Bedrock at depth of 20 to 40 inches.	Bedrock at depth of 20 to 40 inches.
Severe: flood hazard.	Severe: flood hazard.	Moderate: moderate permeability.	Moderate: fair resistance to piping and erosion.	Subject to flooding; surface drainage needed.	Subject to flooding.	Subject to flooding.
Severe: bedrock at depth of 12 to 20 inches.	Moderate: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.
Severe: seasonal water table at depth of 48 to 72 inches.	Moderate: moderate shrink-swell potential; loose sand on surface hinders excavation.	Moderate: moderately slow permeability.	Moderate: poor resistance to piping and erosion.	Sandy surface layer; erodible.	Hazard of soil blowing and siltation; surface layer of fine sand.	Erodible; hazard of soil blowing and siltation.
Severe: flood hazard.	Severe: flood hazard.	Moderate: moderate permeability.	Moderate: fair resistance to piping and erosion.	Subject to flooding.	Subject to flooding.	Subject to flooding.
Severe: clayey texture.	Moderate: moderate shrink-swell potential.	Moderate: moderately slow permeability.	Slight	High intake rate in surface layer; moderately slow permeability in subsoil.	Ponding hazard on level terraces.	Cuts expose clay in places.
Severe: clayey texture.	Moderate: moderate shrink-swell potential.	Moderate: moderately slow permeability.	Slight	Very high intake rate in surface layer; moderately slow permeability in subsoil; slope.	Slope; ponding hazard on level terraces; siltation hazard.	Cuts expose clay in places; slope; siltation hazard.
Severe: clayey texture.	Moderate: moderate shrink-swell potential.	Moderate: moderately slow permeability.	Slight	High intake rate in surface layer; moderately slow permeability in subsoil; slope.	Slope; ponding hazard on level terraces.	Cuts expose clay in places.

TABLE 5.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree and kind of limitation for—			
	Topsoil	Road fill	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements
Kavett: KaA, KaB	Poor: clayey texture.	Poor: high shrink-swell potential.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: high shrink-swell potential; bedrock at depth of 12 to 20 inches.
*Mangum: Ma, Mb, Mf. For Urban land part of Mb, see Urban land.	Fair: silty clay loam, 6 to 10 inches thick.	Poor: high shrink-swell potential.	Severe: very slow permeability; flood hazard.	Severe: flood hazard.	Severe: flood hazard; clayey texture.	Severe: high shrink-swell potential; flood hazard.
Mereta: MrA, MrB, MrC.	Fair: clay loam.	Fair: moderate shrink-swell potential.	Severe: slow permeability; strongly cemented caliche at depth of 14 to 20 inches.	Severe: strongly cemented caliche at depth of 14 to 20 inches.	Moderate: clay loam texture; strongly cemented caliche at depth of 14 to 20 inches.	Moderate: moderate shrink-swell potential.
Miles: MsA, MsB, MsC.	Fair: fine sandy loam, 7 to 12 inches thick.	Fair: fair traffic-supporting capacity.	Slight	Moderate: moderate permeability.	Slight	Slight
*Owens: ObE. For Badland part, see Badland.	Poor: clayey texture.	Poor: high shrink-swell potential.	Severe: very slow permeability.	Severe: slope	Severe: clayey texture.	Severe: high shrink-swell potential.
*Pitzer: PtD, PuD, PwC. For Urban land part of PuD, see Urban land. For Weymouth part of PwC, see Weymouth series.	Poor: 4 to 14 inches of material; 5 to 30 percent coarse fragments.	Good	Severe: indurated caliche at depth of 4 to 14 inches.	Severe: indurated caliche at depth of 4 to 14 inches.	Severe: indurated caliche at depth of 4 to 14 inches.	Moderate: indurated caliche at depth of 4 to 14 inches.
Quanah: QaB, QaC	Fair: clay loam.	Fair: fair traffic-supporting capacity.	Slight	Moderate: moderate permeability.	Moderate: clay loam.	Moderate: low strength.
Randall: Ra	Poor: clayey texture.	Poor: very high shrink-swell potential.	Severe: very slow permeability; flood hazard.	Slight	Severe: somewhat poorly drained; flood hazard.	Severe: very high shrink-swell potential; flood hazard.
Rioconcho: Rc, Rf	Fair: clay loam.	Poor: high shrink-swell potential.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.	Severe: flood hazard.
Rock outcrop. Too variable to be rated. Mapped in an undifferentiated unit with Ustochrepts and in association with Tarrant soils.						

interpretations—Continued

Degree and kind of limitation for—Continued				Soil features affecting—		
Sanitary landfill[1]	Local roads and streets	Farm ponds		Irrigation	Terraces and diversions	Waterways
		Reservoir areas	Embankments			
Severe: bedrock at depth of 12 to 20 inches.	Severe: high shrink-swell potential; bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Severe: bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.	Bedrock at depth of 12 to 20 inches.
Severe: flood hazard; clayey texture.	Severe: high shrink-swell potential; flood hazard.	Slight	Moderate: fair slope stability.	Very slow permeability; subject to flooding.	Subject to flooding.	Cuts expose clayey material in places; subject to flooding.
Moderate: strongly cemented caliche at depth of 14 to 20 inches.	Moderate: moderate shrink-swell potential.	Severe: seepage hazard.	Severe: bedrock at depth of 14 to 20 inches.	Strongly cemented caliche at depth of 14 to 20 inches.	Strongly cemented caliche at depth of 14 to 20 inches.	Strongly cemented caliche at depth of 14 to 20 inches.
Slight	Moderate: fair traffic-supporting capacity	Moderate: moderate permeability.	Moderate: medium compressibility; fair stability; poor resistance to piping and erosion.	Slope	All features favorable.	All features favorable.
Severe: clayey texture.	Severe: high shrink-swell potential; poor traffic-supporting capacity.	Slight	Moderate: fair stability; erodible on slopes; high compressibility.	Slope	Cuts expose clay in places.	Cuts expose clay in places.
Severe: indurated caliche at depth of 4 to 14 inches.	Slight	Severe: indurated caliche at depth of 4 to 14 inches.	Moderate: fair stability; poor resistance to piping and erosion.	Indurated caliche at depth of 4 to 14 inches.	Indurated caliche at depth of 4 to 14 inches.	Indurated caliche at depth of 4 to 14 inches.
Moderate: clay loam.	Moderate: fair traffic-supporting capacity.	Moderate: moderate permeability.	Moderate: fair slope stability.	Moderate permeability; slope.	All features favorable.	All features favorable.
Severe: clayey texture; flood hazard.	Severe: very high shrink-swell potential; flood hazard.	Slight	Moderate: fair slope stability; high compressibility	Very slow intake rate; subject to flooding.	Subject to flooding.	Subject to floodig.

TABLE 5.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree and kind of limitation for—			
	Topsoil	Road fill	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements
Rotan: RnA, RnB	Fair: clay loam.	Poor: high shrink-swell potential.	Severe: moderately slow permeability.	Slight	Severe: clayey texture.	Severe: high shrink-swell potential.
*Rowena: RoA, RoB, RuA. For Urban land part of RuA, see Urban land.	Fair: clay loam.	Poor: high shrink-swell potential.	Severe: moderately slow permeability.	Slight	Severe: clayey texture.	Severe: high shrink-swell potential.
*Sagerton: SaA, SaB, SeB. For Urban land part of SeB, see Urban land.	Fair: clay loam.	Fair: moderate shrink-swell potential.	Severe: moderately slow permeability.	Slight	Severe: clayey texture.	Moderate: moderate shrink-swell potential.
Shep: ShB, ShC, ShD	Fair: calcareous.	Fair: fair traffic-supporting capacity.	Slight	Severe: excessive seepage.	Slight	Slight
Speck: SpA, SpB	Fair: clay loam.	Poor: bedrock at depth of 14 to 20 inches.	Severe: slow permeability; bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.
Stamford: StB	Poor: clayey texture.	Poor: very high shrink-swell potential; poor traffic-supporting capacity.	Severe: very slow permeability.	Slight	Severe: clayey texture.	Severe: very high shrink-swell potential.
*Tarrant: TAD, TED, TFF, TFG, TLD. For Kavett part of TED and Vernon part of TLD, see their respective series. For Rock outcrop part of TFF and TFG, see Rock outcrop.	Poor: clayey texture.	Poor: high shrink-swell potential.	Severe: bedrock at depth of 6 to 20 inches.	Severe: bedrock at depth of 6 to 20 inches.	Severe: bedrock at depth of 6 to 20 inches.	Severe: bedrock at depth of 6 to 20 inches.
Tillman: TmA, TmB	Fair: clay loam.	Poor: high shrink-swell potential.	Severe: slow permeability.	Slight	Severe: clayey texture.	Severe: high shrink-swell potential.
*Tobosa: ToA, ToB, TuB. For Urban land part of TuB, see Urban land.	Poor: clayey texture.	Poor: very high shrink-swell potential.	Severe: very slow permeability.	Slight	Severe: clayey texture.	Severe: very high shrink-swell potential.
Urban land: Ub. Too variable to be rated.						

interpretations—Continued

Degree and kind of limitation for—Continued				Soil features affecting—		
Sanitary landfill[1]	Local roads and streets	Farm ponds		Irrigation	Terraces and diversions	Waterways
		Reservoir areas	Embankments			
Severe: clayey texture.	Severe: high shrink-swell potential.	Moderate: moderately slow permeability.	Moderate: fair resistance to piping and erosion.	Moderately slow intake rate.	All features favorable.	All features favorable.
Severe: clayey texture.	Severe: high shrink-swell potential.	Moderate: moderately slow permeability.	Moderate: high compressibility; fair resistance to piping and erosion.	Moderately slow intake rate.	Ponding hazard on level terraces.	Cuts expose clay in places.
Severe: clayey texture.	Moderate: moderate shrink-swell potential; fair traffic-supporting capacity.	Moderate: moderately slow permeability.	Moderate: fair resistance to piping and erosion.	Moderately slow intake rate.	Ponding hazard on level terraces.	Cuts expose clay in places.
Slight	Fair: fair traffic-supporting capacity.	Severe: excessive seepage.	Moderate: fair resistance to piping and erosion.	Slope	Slope	Slope.
Severe: bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.	Severe: bedrock at depth of 14 to 20 inches.	Slow intake rate; bedrock at depth of 14 to 20 inches.	Bedrock at depth of 14 to 20 inches.	Bedrock at depth of 14 to 20 inches.
Severe: clayey texture.	Severe: very high shrink-swell potential; poor traffic-supporting capacity.	Slight	Moderate: high compressibility; fair stability.	Very slow intake rate.	Ponding hazard on level terraces.	Erodible.
Severe: bedrock at depth	Severe: bedrock at depth of 6	Severe: bedrock at depth of 6	Severe: bedrock at depth of 6	Bedrock at depth of 6 to 20	Bedrock at depth of 6 to 20	Bedrock at depth of 6 to 20

TABLE 5.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree and kind of limitation for—			
	Topsoil	Road fill	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements
*Ustochrepts: URF. Too variable to be rated. For Rock outcrop part, see Rock outcrop.						
Valera: VaA, VaB	Poor:	Poor: high	Severe: moder-	Severe: bedrock at depth of 20	Severe: clayey texture; bed	Severe: high shrink-swell

interpretations—Continued

Degree and kind of limitation for—Continued				Soil features affecting—		
Sanitary landfill[1]	Local roads and streets	Farm ponds		Irrigation	Terraces and diversions	Waterways
		Reservoir areas	Embankments			
Severe: clayey texture; bedrock at depth of 20 to 40 inches.	Severe: high shrink-swell potential; poor traffic-supporting capacity; bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Moderate: high compressibility; bedrock at depth of 20 to 40 inches.	Moderately slow intake rate; bedrock at depth of 20 to 40 inches.	Bedrock at depth of 20 to 40 inches.	Bedrock at depth of 20 to 40 inches.
Severe: clayey texture.	Severe: high shrink-swell potential; poor traffic-supporting capacity.	Slight	Moderate: high compressibility; fair slope stability.	Very slow intake rate; clay shale at depth of 20 to 36 inches.	Ponding hazard on level terraces.	Cuts expose dense clay shale in places.
Severe: clayey texture.	Severe: high shrink-swell potential; poor traffic-supporting capacity.	Slight	Moderate: high compressibility; fair slope stability.	Very slow intake rate; slope.	Slope	Slope.
Moderate: clay loam.	Moderate: fair traffic-supporting capacity.	Moderate: moderate permeability.	Moderate: poor resistance to piping and erosion.	Slope	All features favorable.	All features favorable.

terial, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability. Also considered in the ratings is damage that results at the area from which topsoil is taken.

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with

is a soil property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the solids. A lagoon has a nearly level floor and sides, or embankments, of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected

TABLE 6.—*Engineering*

[Tests performed by the Texas Highway Department in accordance with standard

Soil name and location	Parent material	Texas report No.	Depth from surface	Shrinkage		
				Limit	Lineal	Ratio
			Inches	*Percent*	*Percent*	*Percent*
Hamby fine sandy loam: 0.45 mile S. from NE. entrance to Dyess Air Force Base on unpaved road bordering the	Calcareous sandy outwash sediment	69-650-R 69-651-R	9–28 60–80	17 13	11.3 16.9	1.84 2.07

test data

procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis[1]										Liquid limit	Plasticity index	Classification	
Percentage less than 3 inches passing sieve—								Percentage smaller than—					
1½ in	1 in	¾ in	⅜ in	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.005 mm	0.002 mm			AASHO[2]	Unified[3]
											Percent			
				100	99	96	45	43	37	34	40	23	A-6(6)	SC
			100	98	97	96	77	72	47	38	47	31	A-7-6(17)	CL
98	98	98	98	96	93	88	77	70	36	26	43	19	A-7-6(12)	CL
				100	99	98	83	77	50	40	55	31	A-7-6(19)	CH
			100	99	96	92	81	77	58	40	39	22	A-6(13)	CL
100	98	97	93	86	81	74	54	51	34	25	38	23	A-6(9)	CL
			100	99	98	95	78	62	45	37	38	21	A-6(12)	CL
			100	99	99	98	68	64	43	34	34	19	A-6(10)	CL
	100	97	94	90	86	79	45	42	23	17	26	12	A-6(3)	SC
	100	99	95	90	86	79	48	42	26	19	28	17	A-6(5)	SC

[2] Based on AASHO Designation M 145-49.
[3] Based on the Unified Soil Classification System.

of roads and streets are load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHO and Unified classifications of the soil material and also the shrink-swell potential, indicate its load-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Pond embankments are raised structures of soil material constructed across drainageways in order to impound water. These embankments are generally less than 20 feet high and are constructed of homogeneous soil material and compacted to medium density. Embankments of the core and shell type of construction are not rated in this table. Embankment foundation, reservoir area, and slope are assumed to be suitable for pond construction. Soil properties are considered that affect the embankment and the availability of borrow material. The best soils have good slope stability, low permeability, good shear strength, slight compressibility under load, and good resistance to piping and erosion. The best borrow material is free of stones or rocks and thick enough for easy excavation.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, and soil blowing; soil texture; content of stones; accumulations of salts and alkali; depth of root zone; rate of water intake at the surface; permeability in soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or

other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these terraces and diversions provides outlets for runoff and is not difficult to vegetate.

Waterways are either natural or shaped channels seeded

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good

TABLE 7.—*Degree and kind of soil limitation for major types of recreational development*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series that appear in the first column of this table]

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Badland. Too variable to be rated. Mapped only in a complex with Owens soils.				
*Clairemont: Ca, Cn. For Urban land part of Cn, see Urban land.	Severe: flood hazard	Moderate: flood hazard	Severe: flood hazard	Slight.
Cobb: CoB	Slight	Slight	Slight	Slight.
Colorado: Cr	Severe: flood hazard	Moderate: flood hazard	Moderate: flood hazard	Slight.
Cosh: CsB	Slight	Slight	Severe: bedrock at a depth of 12 to 20 inches.	Slight.
Demona variant: DeB	Moderate: sandy texture.	Moderate: sandy texture.	Severe: sandy texture	Moderate: sandy texture.
Gageby: Ga	Severe: flood hazard	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
*Hamby: HbA, HbB, HbC, HuB. For Urban land part of HuB, see Urban land.	Moderate: moderately slow permeability.	Slight	Moderate: moderately slow permeability.	Slight.
HaB	Moderate: moderately slow permeability.	Moderate: loamy fine sand.	Severe: loamy fine sand.	Moderate: loamy fine sand.
Kavett: KaA, KaB	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
*Mangum: Ma, Mb. For Urban land part of Mb, see Urban land	Severe: very slow permeability.	Moderate: silty clay loam.	Severe: very slow permeability.	Moderate: silty clay loam.
Mf	Severe: flood hazard	Severe: flood hazard	Severe: flood hazard	Severe: flood hazard.
Mereta: MrA, MrB, MrC	Moderate: clay loam	Moderate: clay loam	Severe: strongly cemented caliche at a depth of 14 to 20 inches.	Moderate: clay loam.
Miles: MsA	Slight	Slight	Slight	Slight.
MsB, MsC	Slight	Slight	Moderate: slope	Slight.
*Owens: ObE. For Badland part of ObE, see Badland.	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
*Pitzer: PtD, PuD, PwC. For Urban land part of PuD, see Urban land. For Weymouth part of PwC, see Weymouth series.	Moderate: slow permeability.	Slight	Severe: indurated caliche at a depth of 4 to 14 inches.	Slight.
Quanah: QaB, QaC	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
Randall: Ra	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
Rioconcho: Rc, Rf	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
Rock outcrop. Too variable to be rated. Mapped only in undifferentiated unit with Ustochrepts and in associations with Tarrant soils.				

TABLE 7.—*Degree and kind of soil limitation for major types of recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Rotan: RnA, RnB	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
*Rowena: RoA, RoB, RuA. For Urban land part of RuA, see Urban land.	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
*Sagerton: SaA, SaB, SeB. For Urban land part of SeB, see Urban land.	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
Shep: ShB, ShC	Slight	Slight	Moderate: slope	Slight.
ShD	Slight	Slight	Severe: slope	Slight.
Speck: SpA, SpB	Moderate: clay loam	Moderate: clay loam	Severe: depth to bedrock.	Moderate: clay loam.
Stamford: StB	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
*Tarrant: TAD, TED, TFF, TFG, TLD. For Kavett part of TED and Vernon part of TLD, see their respective series. For Rock outcrop part of TFF and TFG, see Rock outcrop.	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
Tillman: TmA, TmB	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.
*Tobosa: ToA, ToB, TuB. For Urban land part of TuB, see Urban land.	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
Urban land: Ub. Too variable to be rated.				
*Ustochrepts: URF. Too variable to be rated. For Rock outcrop part, see Rock outcrop.				
Valera: VaA, VaB	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
Vernon: VeB, VeE	Severe: clay	Severe: clay	Severe: clay	Severe: clay.
*Weymouth: WeB, WeC WuD. For Urban land part of WuD, see Urban land.	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam	Moderate: clay loam.

entirely. Finally, time is needed for the changing of the parent material into a soil profile. It may be much or little [illegible] recent deposits of alluvium, outwash from Cretaceous formations, and clayey sediment over limestone.

[illegible] Vernon and Tillman soils are examples of those that

Such soils as those of the Rowena and Shep series have accumulated a horizon of calcium carbonate caused by water leaching the soluble material to a certain depth. These soils also contain free lime throughout the profile, because not enough water passes through them to leach out all of the free lime.

Taylor County has mild winters and hot summers, which contributes to the continuous decomposition of residue from plants and animals by micro-organisms. Some soils, such as those of the Sagerton and Rotan series, have a high organic-matter content.

Plants and animals

Plants, animals, insects, bacteria, and fungi are important in the formation of soils. Living organisms affect gains or losses in organic matter and plant nutrients. Structure and porosity are also affected by living organisms.

In Taylor County vegetation has an effect on soil formation. The soils in Taylor County are low or high in content of organic matter because of the amount of vegetation. Organic matter is formed from decaying leaves and stems; hence, where the vegetation is limited, such soils as those in the Hamby and Miles series are low in organic-matter

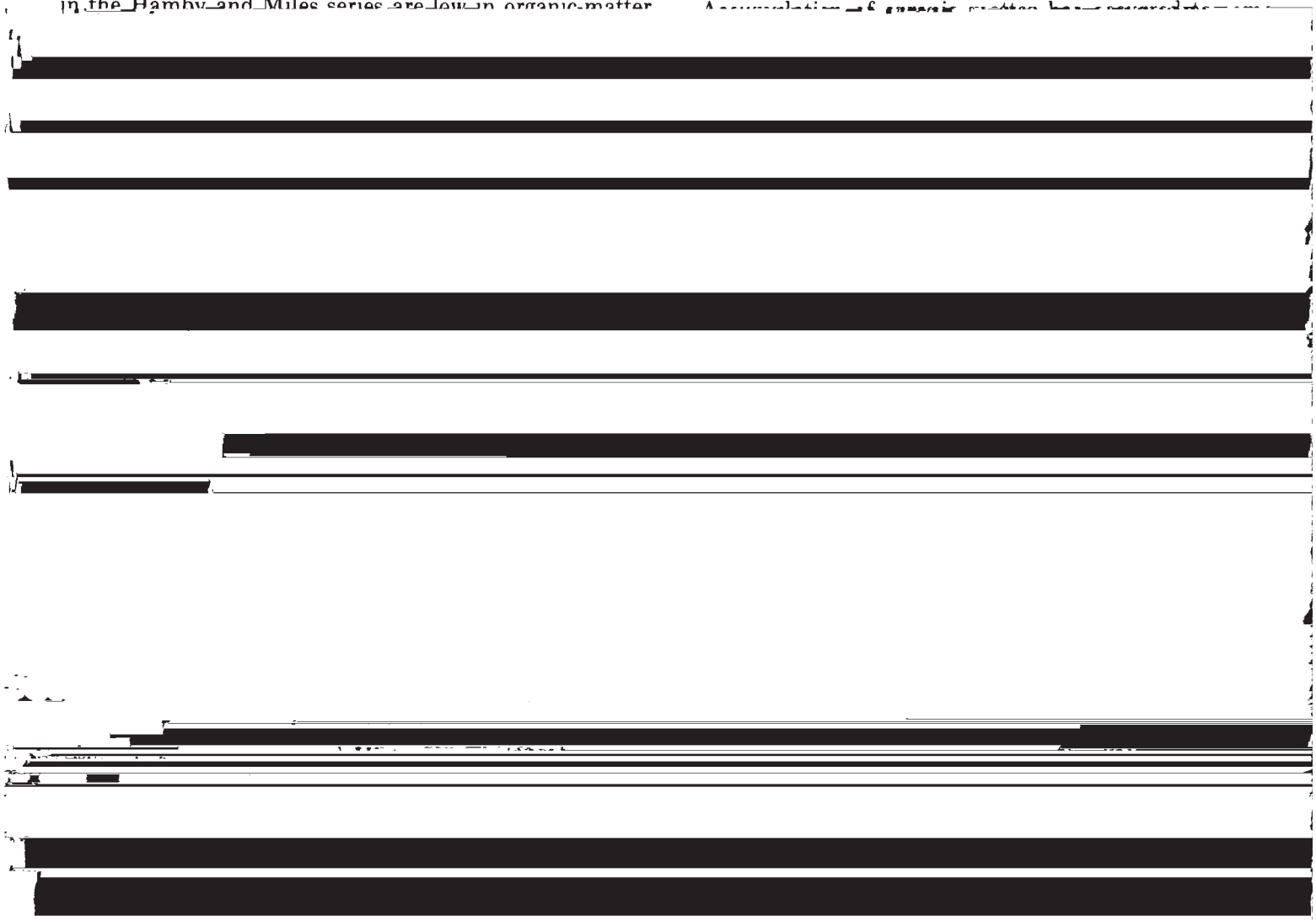
cession of layers, or horizons, from the surface down to rock. The horizons differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction. They may be thick or thin.

Most soil profiles contain three major horizons, called A, B, and C. In some soils a B horizon has not formed.

The A horizon is the surface layer. It can be either the horizon of maximum organic matter, called the A1 horizon; or the horizon of maximum leaching of dissolved or suspended materials, called the A2 horizon. It is a horizon of maximum accumulation of dissolved or suspended materials, such as iron and clay. The B horizon may be firmer than those horizons immediately above and below it, and it may have blocky structure.

Next is the C horizon, which is little affected by the soil-forming process but can be material modifed by weathering.

Several processes were involved in the formation of horizons in the soils of Taylor County. Among the more important processes in horizon differentiation in the soils of Taylor County are the accumulation of organic matter, the leaching and accumulation of carbonates and bases, and the formation and translocation of silicate clays.



United States in recent years. The older system was adopted in 1938 and later revised. The system currently used by the National Cooperative Soil Survey was developed in the early sixties and was adopted in 1965.[9] It is under continual study.[10]

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 8 shows the classification of each soil series of Taylor County by family, subgroup, and order, according to the current system.

General Nature of the County

In this section the history and topography of Taylor County are described. Detailed information is also given about climate, farming, and water supply in the county.

History

Taylor County was named for the Taylor brothers, Edward, James, and George, who were heroes at the Alamo. The county was created in 1858 and organized in 1878, from land that was part of Bexar and Travis Counties.

The major city in Taylor County is Abilene, which had a population of 89,653 in 1972. Abilene is the State's 15th largest city. Other towns include Tye, Impact, Buffalo Gap, Lawn, Tuscola, Merkel, and Trent. Dyess Air Force Base is located in the county. The county has two colleges and one university.

Topography

Relief in Taylor County consists of nearly level to sloping plains and steep escarpments. These escarpments separate the Rolling Plains from the Edward Plateau. The south part of the county drains into the Colorado River Basin, and the northern part drains into the Brazos River Basin.

Climate[11]

Taylor County lies roughly on the boundary between the humid climate of east Texas and the semiarid climate to

[9] United States Department of Agriculture. Soil classification, a comprehensive system, 7th approximation. U.S. Dept. Agr., Soil Conservation Service. 265 pp., illus. 1960.

[10] Simonson, Roy W. Soil classification in the United States. Science 137: 1027-1034. 1962.

[11] By Robert B. Orton, climatologist for Texas, National Weather Service, U.S. Department of Commerce.

TABLE 8.—*Classification of soil series*

Series	Family	Subgroup	Order
Clairemont	Fine-silty, mixed (calcareous), thermic	Typic Ustifluvents	Entisols.
Cobb	Fine-loamy, mixed, thermic	Udic Haplustalfs	Alfisols.
Colorado	Fine-loamy, mixed (calcareous), thermic	Typic Ustifluvents	Entisols.
Cosh	Loamy, mixed, thermic, shallow	Udic Rhodustalfs	Alfisols.
Demona (variant)	Clayey, mixed, thermic	Aquic Arenic Paleustalfs	Alfisols.
Gageby[1]	Fine-loamy, mixed, thermic	Cumulic Haplustolls	Mollisols.
Hamby	Fine, mixed, thermic	Udic Paleustalfs	Alfisols.
Kavett	Clayey, montmorillonitic, thermic, shallow	Petrocalcic Calciustolls	Mollisols.
Mangum	Fine, mixed (calcareous), thermic	Vertic Ustifluvents	Entisols.
Mereta	Clayey, mixed, thermic, shallow	Petrocalcic Calciustolls	Mollisols.
Miles	Fine-loamy, mixed, thermic	Udic Paleustalfs	Alfisols.
Owens	Clayey, mixed, thermic, shallow	Typic Ustochrepts	Inceptisols.
Pitzer	Loamy, mixed, thermic, shallow	Petrocalcic Calciustolls	Mollisols.
Quanah[2]	Fine-silty, mixed, thermic	Typic Calciustolls	Mollisols.
Randall	Fine, montmorillonitic, thermic	Udic Pellusterts	Vertisols.
Rioconcho	Fine, mixed, thermic	Vertic Haplustolls	Mollisols.
Rotan	Fine, mixed, thermic	Pachic Paleustolls	Mollisols.
Rowena	Fine, mixed, thermic	Vertic Calciustolls	Mollisols.
Sagerton	Fine, mixed, thermic	Typic Paleustolls	Mollisols.
Shep	Fine-loamy, mixed, thermic	Typic Ustochrepts	Inceptisols.
Speck	Clayey, mixed, thermic	Lithic Argiustolls	Mollisols.

the west and north. The normal annual rainfall is about 23 inches. The rainfall pattern is typical of the Great Plains: the largest amount falls during the spring months of April, May, and June and during September and October in fall. A large part of the rainfall is the result of thunderstorm activity, and wide variations occur from year to year. The range in precipitation has been from 9.78 inches in 1956 to 48.77 inches in 1941.

The wide range between maximum and minimum temperatures characteristic of the Great Plains extends into the area of Taylor County. Periods of very cold

continues through May, supplemental feeding may be required during winter when forage is low.

Water Supply

Irrigation, municipal, and industrial water comes from both surface and ground water sources. Taylor County has a limited amount of irrigation water. This water is obtained from Quarternary alluvium deposits in scattered areas throughout the county. These deposits are mainly sands, gravels, silt, and clay that occur as channel fillings

TABLE 9.—*Temperature*

[Based on records kept at Abilene, Texas (ground

	Temperature				Precipitation			
					Probability of receiving selected amount			

and precipitation data

elevation 1,762 feet). The symbol < means less than]

Precipitation—Continued									
Probability of receiving selected amounts during month—Continued				Mean number of days with—			Snow, sleet		
3.00 inches or more	4.00 inches or more	5.00 inches or more	6.00 inches or more	0.10 inch or more	0.50 inch or more	1.00 inch or more	Mean total	Maximum monthly	Greatest depth
Pct	*Pct*	*Pct*	*Pct*				*In*	*In*	*In*
5	1	<1	<1	2	1	([3])	1.4	6.6	3
5	3	1	<1	3	1	([3])	1.1	8.4	4
4	3	<1	<1	2	1	([3])	.9	7.3	6
25	10	5	2	4	2	1	([4])	([4])	----------
60	40	30	10	5	3	1	----------	0	----------
30	20	11	10	4	2	1	----------	0	----------
23	15	10	5	3	1	1	----------	0	----------
15	8	5	3	3	1	1	----------	0	----------
29	19	10	8	4	2	1	----------	0	----------
30	20	11	10	3	1	1	([4])	([4])	----------
9	4	1	<1	3	1	1	.4	8.1	3
8	4	2	<1	2	1	([3])	.5	4.3	4
----------	----------	----------	----------	38	17	8	4.3	8.4	6

[3] Less than one-half day.
[4] Trace.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows:

sesquioxides (iron and aluminum oxides).

coarse; and contrast—*faint*, *distinct*, and *prominent*. The size

The classification is based on the percentage of original, or climax, vegetation on the site, as compared to what ought to grow on it if management were good.

Range site. An area of range where climate, soil, and relief are sufficiently uniform to produce a distinct kind of climax vegetation.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil ma-

The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the

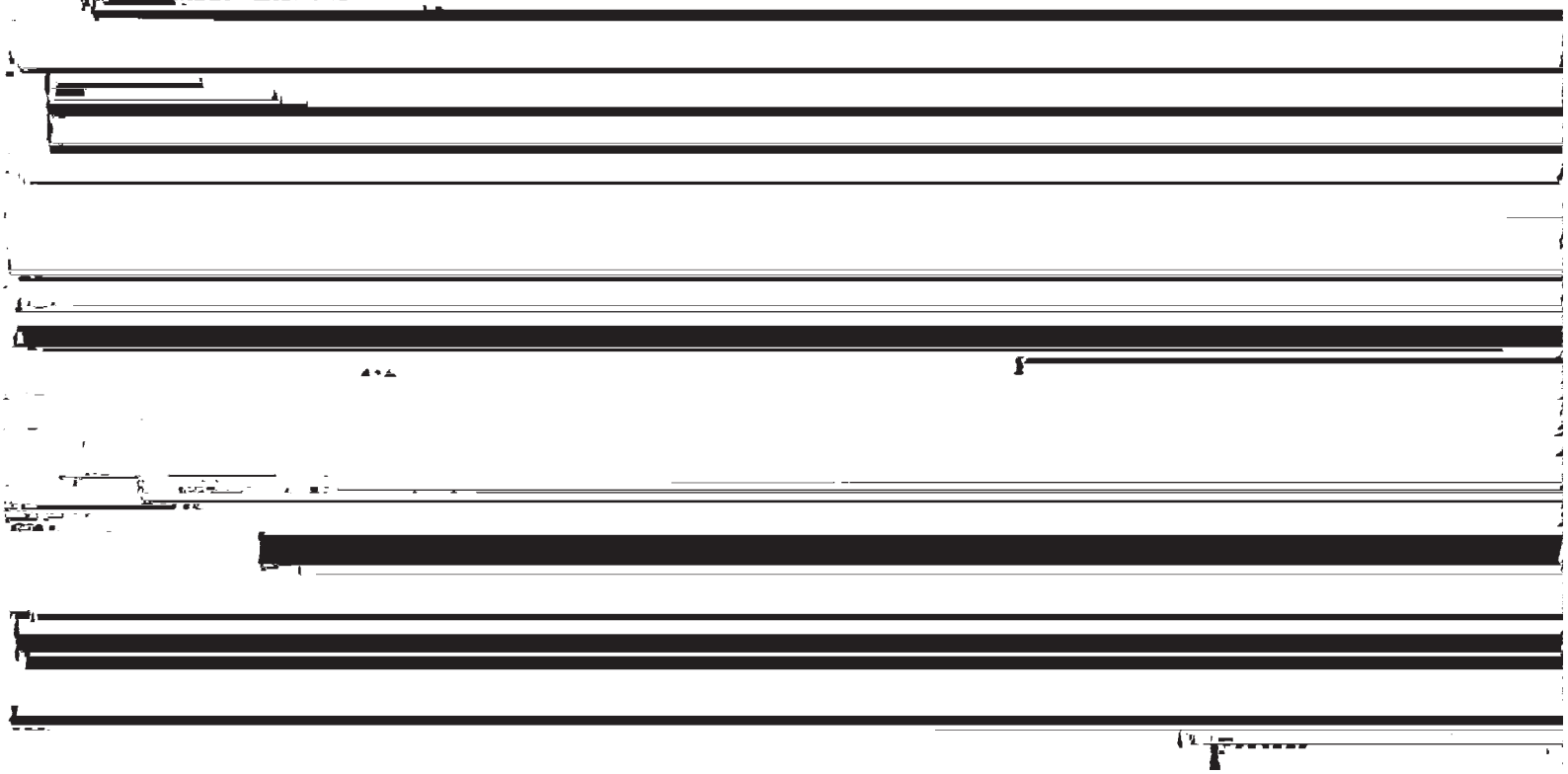
clavpans and hardpans).

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. Other information is given in tables as follows:

Acreage and extent, table 1, page 5.
Estimated yields, table 2, page 33.
Wildlife, table 3, page 40.
Engineering, tables 4, 5, and 6, pages 42, 48, and 56.

Map symbol	Mapping unit	Page	Capability unit		Range site	
			Symbol	Page	Name	Page
Ca	Clairemont silty clay loam	5	IIc-2	30	Loamy Bottomland	34
Cn	Clairemont-Urban land complex	6	-----	--	--------	--
CoB	Cobb fine sandy loam, 1 to 3 percent slopes	7	IIIe-4	30	Sandy Loam	36
Cr	Colorado soils, frequently flooded	7	Vw-1	31	Loamy Bottomland	34
CsB	Cosh fine sandy loam, 1 to 3 percent slopes	8	IIIe-5	31	Sandy Loam	36
DeB	Demona fine sand, alkaline subsoil variant, 0 to 3 percent slopes	8	IIIe-6	31	Sandy	35
Ga	Gageby clay loam	9	IIc-1	30	Loamy Bottomland	34
HaB	Hamby loamy fine sand, 0 to 3 percent slopes	9	IIIe-6	31	Sandy	35
HbA	Hamby fine sandy loam, 0 to 1 percent slopes	9	IIe-3	30	Sandy Loam	36
HbB	Hamby fine sandy loam, 1 to 3 percent slopes	9	IIIe-4	30	Sandy Loam	36
HbC	Hamby fine sandy loam, 3 to 5 percent slopes	10	IIIe-4	30	Sandy Loam	36
HuB	Hamby-Urban land complex, 0 to 3 percent slopes	10	-----	--	--------	--
KaA	Kavett clay, 0 to 1 percent slopes	10	IIIs-2	31	Shallow	36
KaB	Kavett clay, 1 to 3 percent slopes	10	IIIe-7	31	Shallow	36
Ma	Mangum silty clay loam	11	IIIw-1	31	Clayey Bottomland	34
Mb	Mangum-Urban land complex	11	-----	--	--------	--
Mf	Mangum soils, frequently flooded	11	Vw-1	31	Clayey Bottomland	34
MrA	Mereta clay loam, 0 to 1 percent slopes	12	IIIs-2	31	Shallow	36
MrB	Mereta clay loam, 1 to 3 percent slopes	12	IIIe-7	31	Shallow	36
MrC	Mereta clay loam, 3 to 5 percent slopes	12	IVe-1	31	Shallow	36
MsA	Miles fine sandy loam, 0 to 1 percent slopes	13	IIe-3	30	Sandy Loam	36
MsB	Miles fine sandy loam, 1 to 3 percent slopes	13	IIIe-1	30	Sandy Loam	36
MsC	Miles fine sandy loam, 3 to 5 percent slopes	13	IIIe-4	30	Sandy Loam	36



Map symbol	Mapping unit	Page	Capability unit Symbol	Capability unit Page	Range site Name	Range site Page
SpA	Speck clay loam, 0 to 1 percent slopes----------	21	IIIs-2	31	Redland	35
SpB	Speck clay loam, 1 to 3 percent slopes----------	21	IIIe-7	31	Redland	35
StB	Stamford clay, 1 to 3 percent slopes------------	21	IIe-1	29	Clay Flat	34
TAD	Tarrant association, undulating-----------------	22	VIIs-3	32	Low Stony Hills	34
TED	Tarrant-Kavett association, undulating----------	23	-----	--	--------	--

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