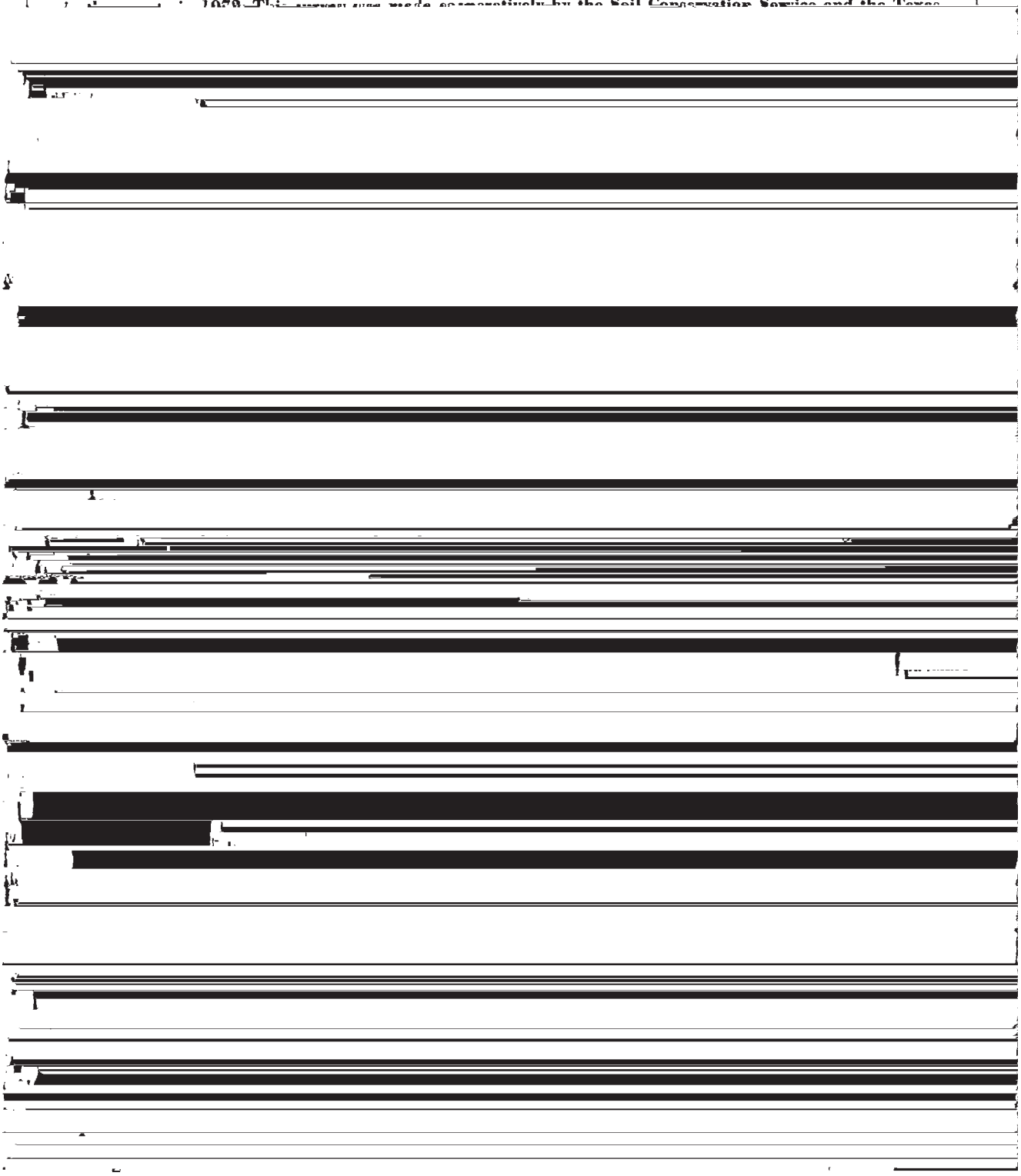
SOIL SURVEY OF

Floyd 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. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1968-72. Soil names and descriptions were approved in 1972. Unless otherwise indicated, statements in the publication refer to conditions [illegible] 1972. This survey was made cooperatively by the Soil Conservation Service and the Texas



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Major fieldwork for this soil survey was completed in the period 1965-75. Soil names and descriptions were approved in 1975. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1975. 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 Hill County-Blackland Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Grain sorghum on Houston Black clay, 1 to 3 percent slopes. The terraces drain into the waterway in the center.

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SOIL SURVEY OF FLOYD COUNTY, TEXAS

BY CONRAD L. NEITSCH AND DON A. BLACKSTOCK, SOIL CONSERVATION SERVICE

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

FLOYD COUNTY is mainly in the Southern High Plains area of Texas (fig. 1). The northeastern part is in the Rolling Red Plains area. Floyd County has a total area of 993 square miles, or 635,520 acres. Elevation ranges from approximately 2,400 feet in the northeastern corner to nearly 3,400 feet in the northwestern corner. The county is tilted to the southeast and has an average grade of about 10 feet per mile.

Floydada, the county seat, is in the south-central part of the county and has a population of about 4,500. The second largest city is Lockney, which has a popula-

Several small intermittent streams are in the county. Crawfish Creek flows through the southwestern part, and Los Linguish Creek flows through the extreme northeastern part. Running Water Draw enters the county on the west and becomes White River before it leaves the county in the south through Blanco Canyon. Quitaque Creek flows from the area near Lone Star and drains toward the southeast. Near South Plains, it meanders toward the northeast and leaves the county just south of Los Linguish Creek. In the extreme eastern part of the county is the head of Pease River. In the area just below the Caprock in the northeastern

The soil scientists made comparisons among the profiles they studied and then compared these profiles described in the survey, but they are called land types

cussed in the following pages. The terms for texture used in the descriptive headings for several of the associations apply to the surface layer. For example, in the title of association 5, the words "fine sandy loams" and "loams" refer to the texture of the surface layer.

1. *Pullman association*

Deep, nearly level to gently sloping, very slowly permeable clay loams

The landscape of this association is a smooth plain that has many dish-shaped, closed depressions. Nearly all runoff is impounded in these depressions.

This association makes up about 73 percent of the county. It is about 82 percent Pullman soils and 18 percent Drake, Estacado, Lofton, Mansker, Olton, and

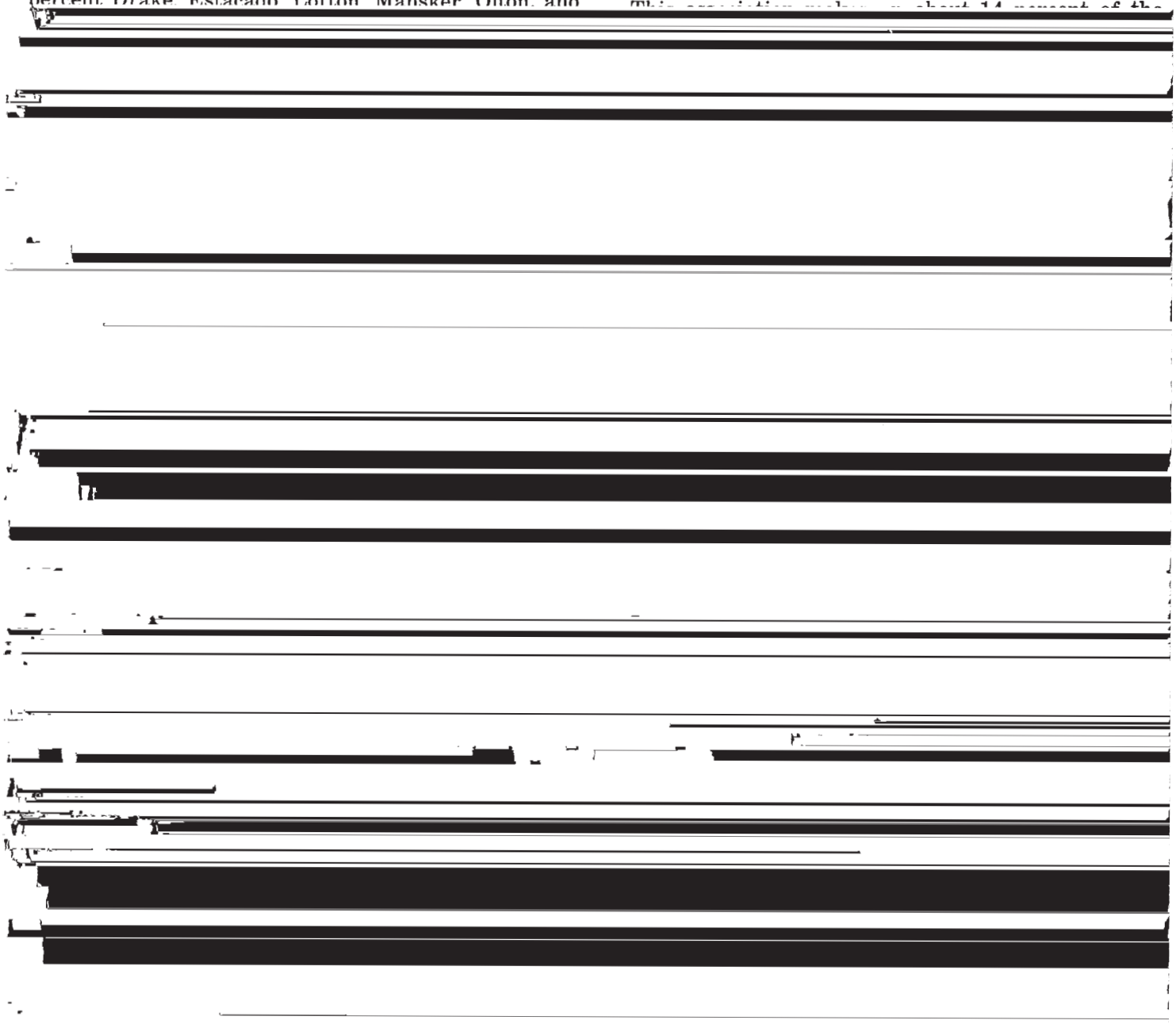
that are mainly adjacent to playas, and Randall soils are on the bottom of playa lakes.

This association is used mostly for crops, but a few areas are in native range. Most cultivated areas are irrigated. The soils are well suited to surface irrigation because the surface is smooth. They are droughty in most places when dryfarmed. Low rainfall is a limitation in most years. The hazard of soil blowing is slight, and the hazard of erosion is slight to moderate.

2. *Pullman-Olton association*

Deep, nearly level to gently sloping, very slowly permeable to moderately slowly permeable clay loams

This association is mostly a smooth plain that has many dish-shaped closed depressions. Nearly all runoff is impounded in these depressions.



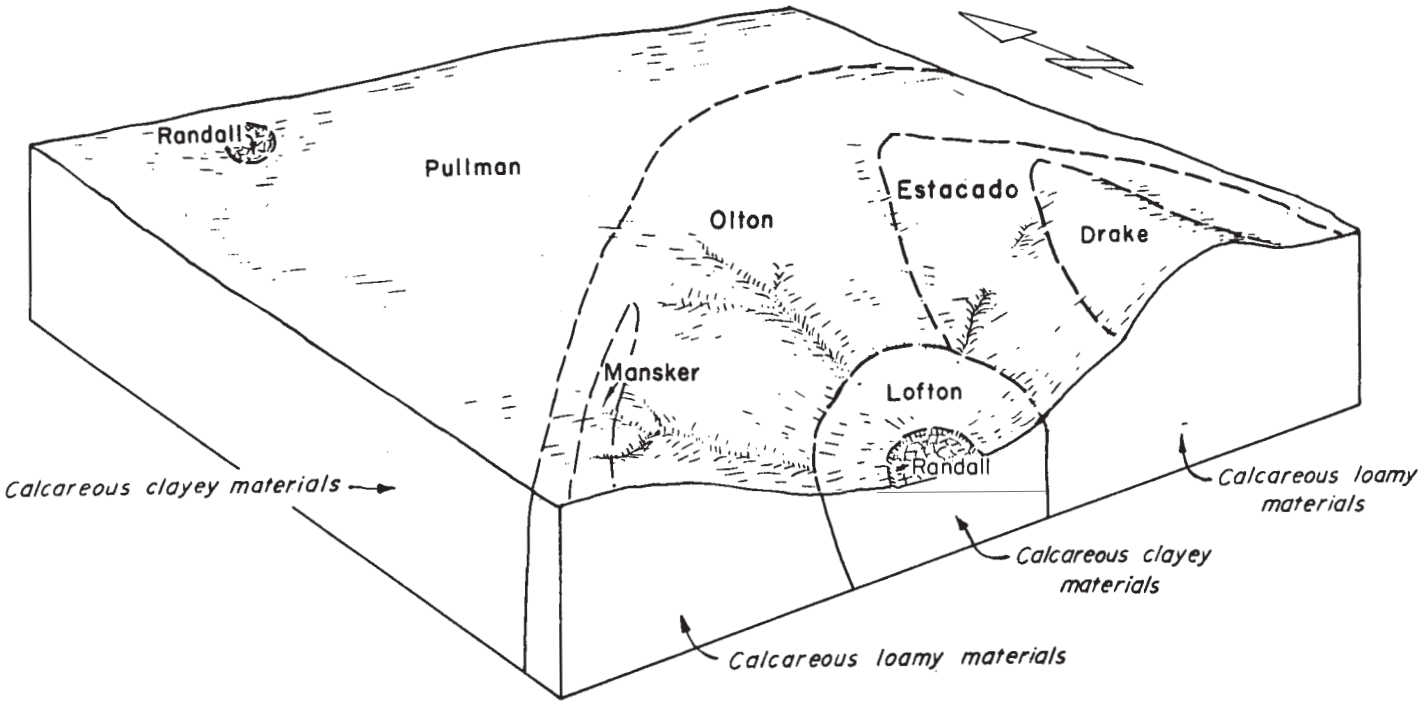


***Figure 3.*—Typical pattern of soils and underlying material in the Pullman-Olton association.**

stone. Polar soils make up about 9 percent, and the remaining 46 percent is Amarillo, Berda, Flomot, Lincoln, Obaro, Paloduro, and Quinlan soils.

Latom soils are in rough areas that give a "stair-step" appearance to the topography. These soils are shallow to very shallow. They have a surface layer of brown fine sandy loam that is moderately permeable. Below this is strongly cemented sandstone.

Polar soils are on the tops and sides of rounded hills. These deep soils have a surface layer of brown gravelly sandy loam. Below this is light-brown very gravelly sandy loam to loamy sand that is moderately rapidly permeable.

Amarillo, Berda, and Flomot soils are in smoother areas on hilltops and in dissected areas. Lincoln soils

county. It is about 32 percent Mansker soils and about 26 percent Bippus soils. The remaining 42 percent is Berda, Estacado, Lofton, Olton, Paloduro, and Potter soils.

Mansker soils are mostly on side slopes that parallel drainageways. These soils have a surface layer of brown clay loam over light-brown to pink clay loam.

Bippus soils are on valley floors. These soils have a surface layer of grayish-brown clay loam over dark grayish-brown to brown clay loam.

Lofton soils are in slightly depressional areas. Berda, Estacado, Olton, Paloduro, and Potter soils are on side slopes and on uplands near drainageways.

This association is used mostly for crops, but a few areas are in range. Most cultivated areas are irrigated.

in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*6*).[1]

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

Soil	Acres	Percent
Amarillo fine sandy loam, 0 to 1 percent slopes	2,400	0.4
Amarillo fine sandy loam, 1 to 3		

calcareous in the lower part. Below this is 25 inches of reddish-yellow, friable sandy clay loam that is 30 percent calcium carbonate. The next layer to a depth of 84 inches is yellowish-red sandy clay loam that is about 10 percent calcium carbonate.

Amarillo soils are well drained. Runoff is slow to medium. Permeability is moderate, and available water capacity is high.

These soils are used mostly for cultivated crops. A few areas are irrigated. Areas in native vegetation are used as range.

Representative profile of Amarillo fine sandy loam, 1 to 3 percent slopes, 10.6 miles east and northeast of Cedar Hill on Farm Road 97 to its intersection with

The surface layer is reddish-brown fine sandy loam about 9 inches thick. The next layer extends to a depth of 70 inches. It is 16 inches of reddish-brown, friable sandy clay loam; 20 inches of yellowish-red, calcareous sandy clay loam; and 25 inches of reddish-yellow sandy clay loam that is about 25 percent calcium carbonate. Below this to a depth of 84 inches is yellowish-red sandy clay loam that is 10 percent calcium carbonate.

Included with this soil in mapping are small areas of Berda and Flomot soils and a few small areas of soils that have gravel on the surface. Also included are a few small areas of Amarillo fine sandy loam, 1 to 3 percent slopes. About 40 percent of Amarillo fine sandy loam, 0 to 1 percent slopes, has secondary car-

Using crops in the cropping system that produce a large amount of crop residue and leaving this residue on the surface help to maintain tilth, control soil blowing and erosion, and conserve soil moisture. An example of a suitable cropping system is 1 year of cotton followed by 2 years of grain sorghum, wheat, or some other high-residue crop. If the crop does not leave enough residue to control soil blowing, chiseling or listing are effective emergency measures. Varying the depth of plowing helps to prevent the formation of a plowpan.

This soil is well suited to sprinkler irrigation, but only a small acreage is irrigated. An irrigation system is needed that provides adequate water for crops and

and contour farming are needed to reduce runoff and control erosion. Diversion terraces and grassed waterways are needed in some areas. Capability unit IVe–2, dryland, and IVe–1, irrigated; Sandy Loam range site.

Berda Series

The Berda series consists of deep, gently sloping to steep, loamy soils on uplands. These soils formed in loamy, calcareous colluvium.

In a representative profile the surface layer is brown, calcareous loam about 8 inches thick. The next layer is brown and light reddish-brown, friable, calcareous loam about 32 inches thick. The underlying material to a depth of 62 inches is light reddish-brown, cal-

of reddish-brown, friable, calcareous loam that has a few films and threads of calcium carbonate. Below this is about 20 inches of reddish-brown, friable, calcareous loam that is about 3 percent films, threads, and small concretions of calcium carbonate. The underlying material is reddish-brown, calcareous loam that extends to a depth of 60 inches.

Included with this soil in mapping are some areas of Amarillo, Bippus, Flomot, Mobeetie, and Paloduro soils. Also included are areas of a soil that is similar to Berda soil but is redder in color. Some areas of soils that are eroded and have small gullies which are difficult to cross with farm machinery are also included.

This Berda soil is [illegible]

blowing and erosion and conserving moisture. Runoff is medium to rapid. The hazard of soil blowing is moderate, and the hazard of erosion is severe.

This soil can be cultivated, but special management and careful selection of crops are needed. Using crops in the cropping system that produce a large amount of crop residue and leaving this residue on the surface help to maintain tilth, control soil blowing and erosion, and conserve moisture. An example of a suitable cropping system is grain sorghum, wheat, or some other

soil is less extensive, but it also is in all areas. The soils are so intermingled that it is not practical to separate them at the scale used in mapping.

The Berda soil is mainly near the crest of knolls and on the convex sides of small hills. It has a surface layer of brown, calcareous loam about 6 inches thick. The next layer is brown, friable, calcareous loam about 18 inches thick that has many worm casts. Below this is about 29 inches of light reddish-brown, friable, calcareous loam that is about 5 percent calcium carbonate

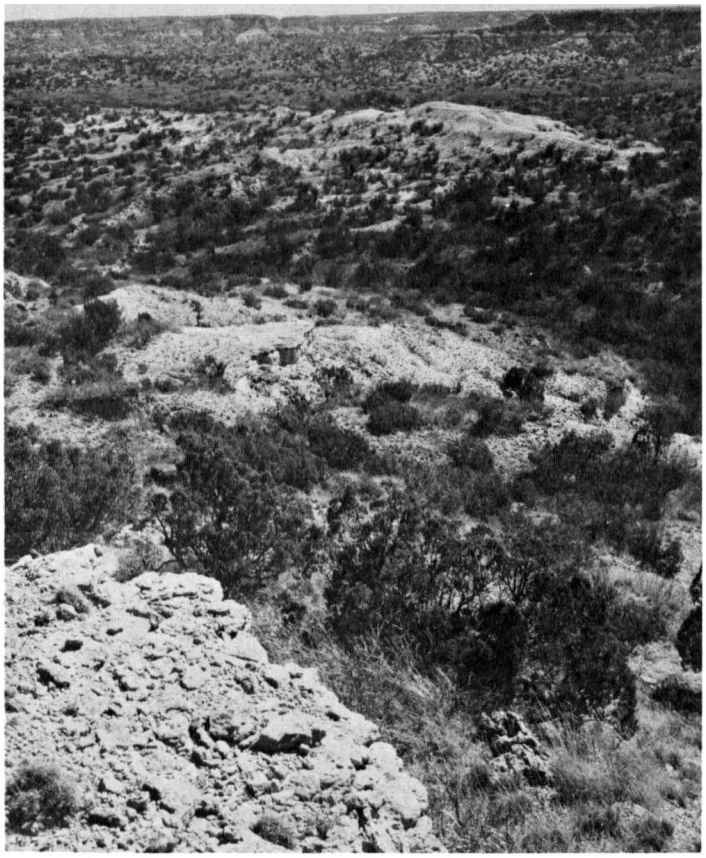


Figure 4.—Area of Berda and Potter soils, steep.

than one-fourth mile. In other areas the elevation difference is 300 feet in one-half mile.

The soils are not in a uniform pattern. Areas of this mapping unit are much larger and their composition is more variable than those of most other mapping units in the county. In some areas the soils are different within a few feet, but in other areas the soils

Formation and are mostly sandy loam to clay loam and are slightly cemented because the content of calcium carbonate is high. The soil material is removed as fast as it forms and is usually barren of any vegetation. Also included are areas of Berda soil that are more than 35 percent caliche rock and some caliche outcrop in areas of Potter soils. Areas of soils that are similar to Bippus and Paloduro soils but are more than 35 percent caliche rock are also included. Paloduro soils are intermingled with the Berda soil and formed in areas where runoff concentrates and organic matter has darkened the surface.

These soils are used as range and wildlife habitat. A few small [illegible] and wild

life live in these areas. The main concerns in management are controlling erosion and conserving moisture. Runoff is medium to very rapid. The hazard of soil blowing is moderate, and the hazard of erosion is severe.

Maintaining a minimum of 50 percent of a season's growth of grass and providing for planned periods of deferred grazing to allow a vigorous growth of grass help to control soil blowing and erosion and conserve moisture. Capability unit VIIe–1, dryland; Rough Breaks range site.

Bippus Series

The Bippus series consists of deep, nearly level, loamy soils in concave areas on uplands. These soils formed in loamy calcareous material along major draws.

In a representative profile the surface layer is grayish-brown and dark grayish-brown, calcareous clay loam about 28 inches thick. The next layer is brown, very friable, calcareous clay loam and sandy clay loam that extends to a depth of 66 inches.

Bippus soils are well drained. Runoff is medium to rapid, and permeability is moderate. Available water capacity is very high.

These soils are used mostly for crops. They are well

carbonate; calcareous; moderately alkaline; gradual, smooth boundary.

B22b—50 to 66 inches, brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak, medium, subangular blocky structure; slightly hard, very friable; few films and threads of calcium carbonate; calcareous; moderately alkaline.

The A horizon is 16 to 28 inches thick and is dark brown, dark grayish brown, or grayish brown. The B2b horizon is reddish-brown, brown, dark-brown, or dark grayish-brown loam, sandy clay loam, or clay loam. Calcium carbonate content ranges from visible films and threads to as much as 10 percent, by volume. In some places weak stratification is evident in lower layers.

Bippus clay loam, 0 to 1 percent slopes (BtA).—This nearly level soil is in narrow, elongated areas that are

brown sandy clay loam that extends to a depth of 75 inches.

Included with this soil in mapping are some areas of Berda, Mansker, and Mobeetie soils.

This Bippus soil is used as range. It is subject to flooding one or more times a year about every 2 years. During periods of excessive rainfall the soil is flooded several days at a time. The main concerns in management are controlling erosion and conserving moisture. Runoff is medium to rapid. The hazards of soil blowing and erosion are slight.

Maintaining a minimum of 50 percent of a season's growth of grass and providing for planned periods of deferred grazing to allow a vigorous growth of grass

loam to clay loam. In a few places this horizon has films, threads, and soft masses of visible segregated calcium carbonate.

Drake soils, 1 to 3 percent slopes (DrB).—These gently sloping soils are in scattered areas of the county. than 18 percent. Also included are small areas of Estacado, Mansker, and Portales soils.

These Drake soils are used mostly as range, but a few areas are cultivated. A few cultivated areas are irrigated. Grain sorghum and wheat are the main

and many films and threads of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

B22tca—26 to 45 inches, reddish-yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; weak, coarse, prismatic structure parting to weak, fine, subangular blocky; hard, friable; few fine roots; few fine pores; patchy clay films; 35 percent, by volume, masses and concretions of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

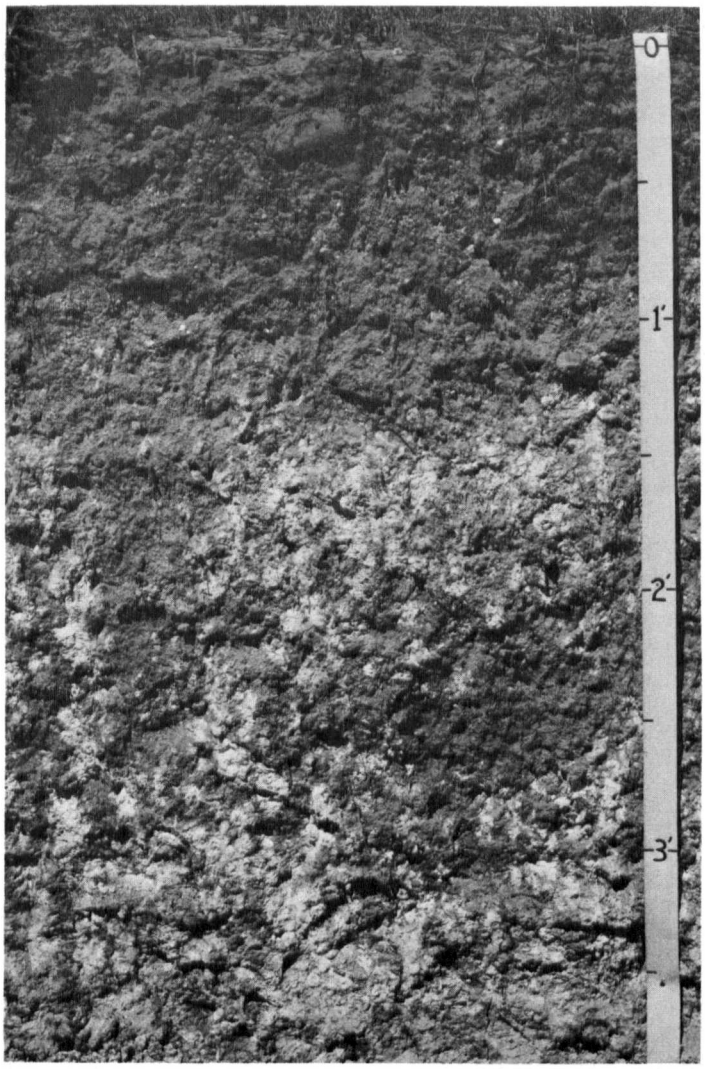
B23tca—45 to 70 inches, reddish-yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; weak, coarse, prismatic structure parting to weak, medium, subangular blocky; hard, friable; few fine pores; patchy clay films; 20 percent, by volume, concretions and soft masses of calcium carbonate; calcareous; moderately alkaline; gradual, wavy boundary.

B24tca—70 to 82 inches, red (2.5YR 5/8) silty clay loam, red (2.5YR 4/8) moist; weak, coarse, prismatic structure parting to weak, fine, subangular blocky; hard, friable; few fine pores; patchy clay films; 5 percent, by volume, small concretions and soft

This gently sloping soil is mostly in playa basins. Areas are narrow and elongated in shape and are 10 to 200 acres in size. Most areas circle playa lakes on the upper edge. Slopes average about 1.7 percent.

The surface layer is dark grayish-brown, calcareous clay loam about 16 inches thick. The next layer is 8 inches of brown, friable clay loam that has many films and threads of calcium carbonate. Below this is about 23 inches of reddish-yellow, friable clay loam that is about 35 percent calcium carbonate. The next layer is about 15 inches of reddish-brown, friable clay loam that is about 20 percent calcium carbonate. Below this to a depth of 82 inches is yellowish-red clay loam that is about 15 percent calcium carbonate.

Included with this soil in mapping are some areas of Mansker, Olton, Posey, and Tulia soils. Also included are a few small areas that have no layers of calcium carbonate accumulation or that have layers of calcium carbonate accumulation more than 30 inches



35 percent soft masses and weakly to strongly cemented concretions of calcium carbonate; calcareous; moderately alkaline; gradual, smooth boundary.

B22ca—12 to 37 inches, light reddish-brown (5YR 6/4) loam, reddish brown (5YR 4/4) moist; weak, medium, subangular blocky structure; hard, friable; few roots; few fine pores; few worm casts in upper part; 48 percent, by volume, soft masses and weakly to strongly cemented concretions of calcium carbonate as much as 3 centimeters in diameter; calcareous; moderately alkaline; diffuse, smooth boundary.

B23tca—37 to 70 inches, yellowish-red (5YR 5/6) loam, yellowish red (5YR 4/6) moist; weak, medium, subangular blocky structure; slightly hard, friable; few pores; patchy clay films visible on surface of peds; 20 percent, by volume, soft masses and concretions of calcium carbonate; calcareous; moderately alkaline.

The solum ranges from 60 inches to more than 80 inches in thickness. The A1 horizon is 5 to 12 inches in thickness and is reddish brown or light brown to brown. The B2ca horizon is at a depth of 7 to 18 inches. It is reddish-brown to light reddish-brown, yellowish-red, reddish-yellow, or light-

losses. Using diversion terraces and grassed water [illegible] to accumulation that are less than 40 percent

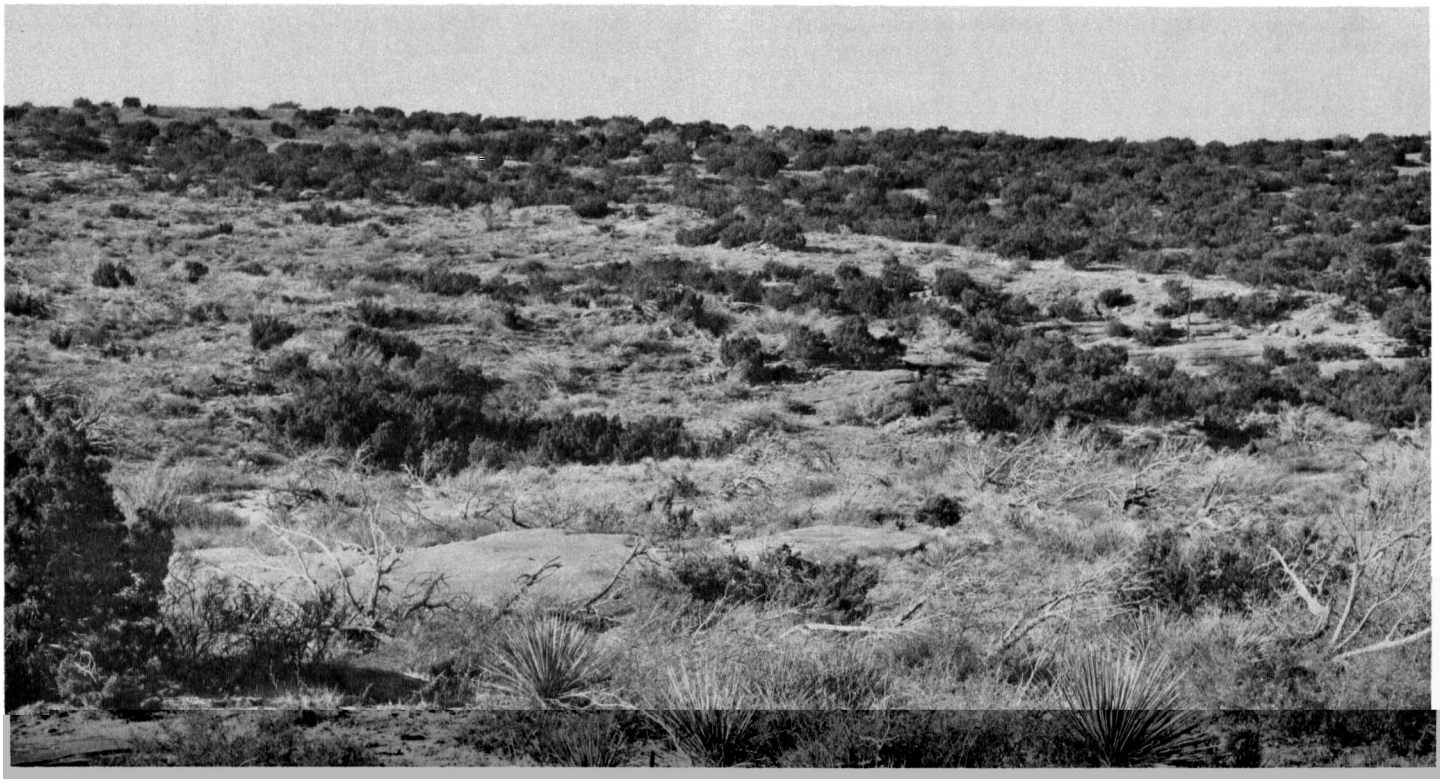


Figure 6.—**Area of Latom soils and Rock outcrop, 5 to 20 percent slopes.**

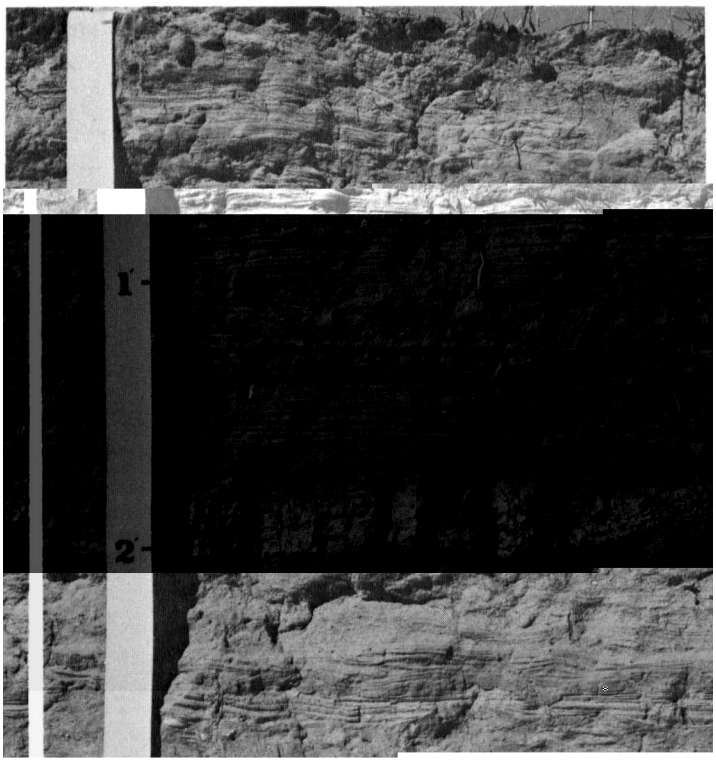
[redacted]

Likes loamy fine sand, 3 to 8 percent slopes (LkD).—This gently sloping to sloping soil is on concave foot slopes and hummocky to duny uplands east of the High Plains Escarpment and along the larger streams. Areas are mainly irregular in shape and are 10 to 50 acres in size.

Included with this soil in mapping are areas of Berda, Latom, and Mobeetie soils. Also included are some areas of soils that have developed more distinct horizons and a few areas that have a dark-colored surface layer. A few areas of soils that have layers of calcium carbonate accumulation in the lower part and a few areas of soils that have sandstone fragments are also included.

This Likes soil is used as range and wildlife habitat. The main concerns in management are controlling erosion and conserving moisture. Runoff is slow. The hazards of soil blowing and erosion are severe.

Reseeding cultivated areas to native grass and providing for planned periods of deferred grazing to allow a vigorous growth of grass help to control soil blowing and erosion. Controlling brush by chemical or mechanical methods helps to conserve moisture. A brush-control program should allow for planned areas of wildlife habitat. Capability unit VIe–1, dryland; Sandy range site.



Lincoln Series

The Lincoln series consists of deep, nearly level, sandy soils on flood plains along major streams. These soils formed in recent, sandy, alluvial material.

In a representative profile the surface layer is light-brown fine sandy loam about 14 inches thick. The underlying material is pink fine sand that extends to a depth of 65 inches (fig. 7).

Lincoln soils are excessively drained. Runoff is slow, and permeability is rapid. Available water capacity is low. A water table is between a depth of 3 and 10 feet in most areas.

These soils are used mainly as range. They are not suited to cultivation. Some areas are used as improved pasture. The soils are subject to flooding during periods of high rainfall and are flooded once every 1 to 3 years in most areas.

channels, and are 10 to 100 acres in size. Slopes are 0 to 1 percent.

Included with these soils in mapping are areas of soils that have a loam surface layer and a few areas of soils that have a clay loam surface layer.

These Lincoln soils are used as range and wildlife habitat. The soils are flooded once every 1 to 3 years for a short period of time. A few areas are flooded more often. The main concern in management is controlling erosion. Runoff is slow. The hazard of soil blowing is severe.

Maintaining a minimum of 50 percent of a season's growth of grass and providing for planned periods of deferred grazing to allow a vigorous growth of grass help to control soil blowing. A brush-control program should allow for planned areas of wildlife habitat. Capability unit Vw–2, dryland; Sandy Bottomland range site.

Lofton Series

The Lofton series consists of deep, nearly level soils on low benches surrounding playa lakes and in small, shallow depressions on uplands. These soils formed in calcareous clayey material.

In a representative profile the surface layer is dark grayish-brown clay loam about 7 inches thick. Below this is 15 inches of dark grayish-brown, firm clay over grayish-brown, very firm and firm, calcareous clay about 33 inches thick. The next layer is about 18 inches of light brownish-gray, firm clay that is about 5 percent calcium carbonate. Below this is white, friable silty clay that extends to a depth of 86 inches (fig. 8).

Lofton soils are mainly in areas that receive runoff from surrounding areas. These soils are moderately well drained. Runoff is very slow to ponded, and permeability is very slow. Available water capacity is high.

These soils are used mostly for crops. Most areas are irrigated, but some are dryfarmed. A few areas are in native vegetation and are used [redacted]

gray. The B2t horizon is dark gray, dark grayish brown, very dark gray, and grayish brown. It is 40 to 50 percent clay. The B2tca horizon is at a depth of 45 to 60 inches. It is white, gray, grayish-brown, or light brownish-gray clay or silty clay. This horizon is 10 to 40 percent, by volume, calcium carbonate. The depth to free carbonates ranges from 16 to 30 inches. In most places vertical lenses of the A horizon material can be seen at depths of 30 to 40 inches.

Lofton clay loam (Lo).—This nearly level soil is on the first bench above the playa lakebeds. Areas are oval in shape and are mostly on the eastern and southern sides of playa lakes. Some areas are in slightly depressional concave areas on uplands. Slopes average about 0.5 percent. Areas average less than 100 acres in size.

Included with this soil in mapping are a few areas of soils that are calcareous to the surface. Also included are small areas of Mansker, Olton, and Pullman soils. In some areas narrow bands of soils that are similar to Lofton soils but have 1 to 3 percent slopes are included.

This Lofton soil is used mostly for crops. Most cultivated areas are irrigated, but a few areas are dryfarmed. Cotton, grain sorghum, and wheat are the main crops. The main concerns in management are [redacted]

moisture. Runoff is slow to ponded. The hazards of soil blowing and erosion are slight.

Using crops in the cropping system that produce a large amount of crop residue and leaving this residue on the surface help to maintain tilth, prevent soil blowing, and conserve moisture. Avoiding tillage operations on this soil when it is wet helps to maintain tilth. An example of a suitable cropping system is cotton followed by grain sorghum, wheat, or some other high-residue crop every other year.

In areas where this soil is irrigated, a properly designed surface irrigation system is needed to provide adequate water for crops and to prevent soil and water losses. Capability unit IIIe–4, dryland, and IIs–1, irrigated; Clay Loam range site.

Mansker Series

The Mansker series consists of deep, gently sloping, loamy soils on uplands. These soils are in areas along drainageways and in areas within many of the playa

Figure 9.—**Profile of Mansker clay loam showing concretions and masses of calcium carbonate.**

Representative profile of Mansker clay loam, 3 to 5 percent slopes, 5.2 miles east on Farm Road 97 from its intersection with Farm Road 378 in Lockney, then 0.5 mile south on a county road and 100 feet east of the road, in range:

A1—0 to 14 inches, brown (7.5YR 4/2) clay loam, dark

meters in diameter of calcium carbonate; calcareous; moderately alkaline; diffuse, wavy boundary.

B23tca—35 to 75 inches, yellowish-red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate, coarse, prismatic structure parting to weak, medium, subangular blocky; slightly hard, friable; few pores; about 20 percent, by volume, weakly cemented concretions as much as about 2 centimeters in diameter; few thin clay films; calcareous; moderately akaline.

The A1 horizon is 6 to 14 inches thick. It is brown, grayish brown, or dark grayish brown. The B2ca horizon is at a depth of 10 to 20 inches. It is pink, light-brown, brown, and reddish-brown loam or clay loam and is 40 to 65 percent, by volume, calcium carbonate. The B2tca horizon is red, reddish-yellow, or yellowish-red clay loam or sandy clay loam. It is 15 to 30 percent, by volume, calcium carbonate.

Mansker clay loam, 1 to 3 percent slopes (MaB).—This gently sloping soil is in convex areas on narrow bands along major draws and within playa basins. Areas average about 25 acres in size. Slopes average about 2 percent.

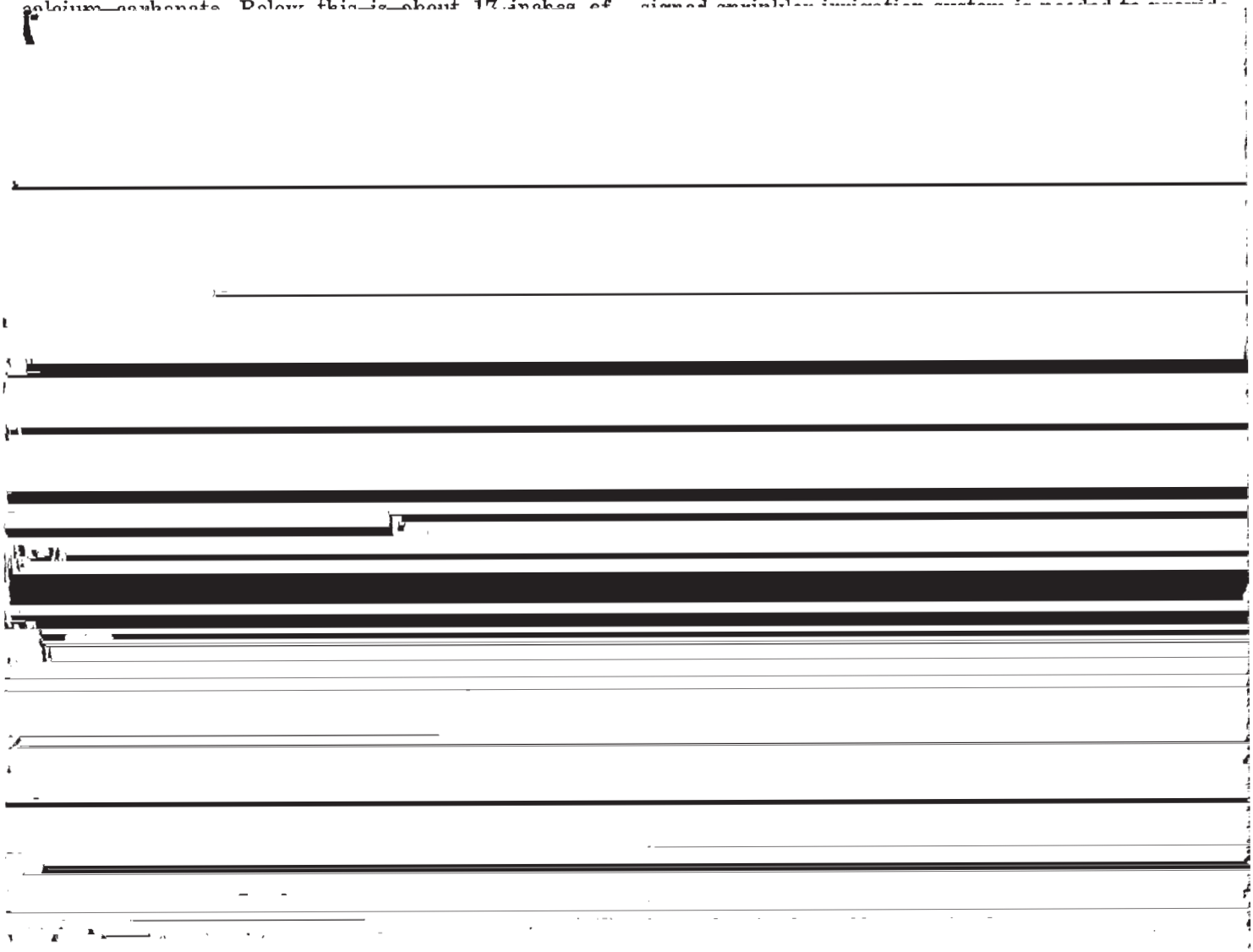
The surface layer is brown, calcareous clay loam about 12 inches thick. The next layer is about 7 inches of brown, friable clay loam that is about 27 percent calcium carbonate. Below this is about 17 inches of

Included with this soil in mapping are areas of Estacado, Olton, Posey, Pullman, and Tulia soils. A few areas of Mansker soils that have slopes of less than 3 percent and some areas of Mansker soils that have slopes of more than 5 percent are included. Also included are a few areas of cultivated soils that are eroded and have gullies which can be crossed by farm machinery.

This Mansker soil is used mostly for crops. Some areas are irrigated. Grain sorghum and wheat are the main crops. The main concerns in management are controlling erosion and soil blowing, maintaining tilth, conserving moisture, and using cropping systems that overcome soil limitations. Runoff is rapid. The hazards of soil blowing and erosion are severe.

Using crops in the cropping system that produce a large amount of crop residue and leaving this residue on the surface help to control soil blowing and erosion, maintain tilth, and conserve moisture. An example of a suitable cropping system is grain sorghum, wheat, or some other high-residue crop grown each year.

In areas where this soil is irrigated, a properly de-



few pebbles and large fragments of caliche; calcareous; moderately alkaline; clear, smooth boundary.

B21—10 to 25 inches, reddish-brown (5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak, coarse, prismatic structure parting to weak, medium, subangular blocky and granular; slightly hard, very friable; few fine pores; few worm casts;

Obaro Series

The Obaro series consists of moderately deep to deep, sloping to strongly sloping, loamy soils on uplands. These soils formed in weakly consolidated, fine-grained, calcareous sandstone.

areas of the mapping unit. Most areas are less than 1 acre to 5 acres in size.

Included with these soils in mapping are red-bed outcrops, mostly in areas of Quinlan soils.

The soils in this mapping unit are used as range and wildlife habitat. The main concerns in management are controlling soil blowing and erosion and conserving moisture. The hazard of soil blowing is moderate, and the hazard of erosion is severe.

Reseeding cultivated areas to native grass and providing for planned periods of deferred grazing to allow a vigorous growth of grass help to control soil blowing and erosion and conserve moisture. Controlling brush by chemical or mechanical methods helps to conserve moisture. A brush-control program should allow for planned areas of wildlife habitat. Capability unit VIe–3, dryland; Mixedland range site.

Olton Series

The Olton series consists of deep, nearly level to gently sloping, loamy soils on uplands. These soils formed in loamy, calcareous, eolian material that was deposited over the High Plains.

In a representative profile the surface layer is reddish-brown clay loam about 9 inches thick. The next layer is reddish-brown firm clay and clay loam about 22 inches thick. Below this is about 13 inches of yellowish-red clay loam that has a few films and threads of calcium carbonate. The next layer is about 28 inches of pink clay loam that is about 40 percent calcium carbonate. Below this is reddish-yellow clay loam that is about 10 percent calcium carbonate and extends to a depth of 84 inches (fig. 10).

Olton soils are well drained. Runoff is very slow to slow, and permeability is moderately slow. Available water capacity is high.

These soils are used mainly for crops. Most areas are irrigated, but a few areas are dryfarmed. A few areas are in native vegetation and are used as range.

Representative profile of Olton clay loam, 1 to 3 percent slopes, 1.7 miles west on county road from

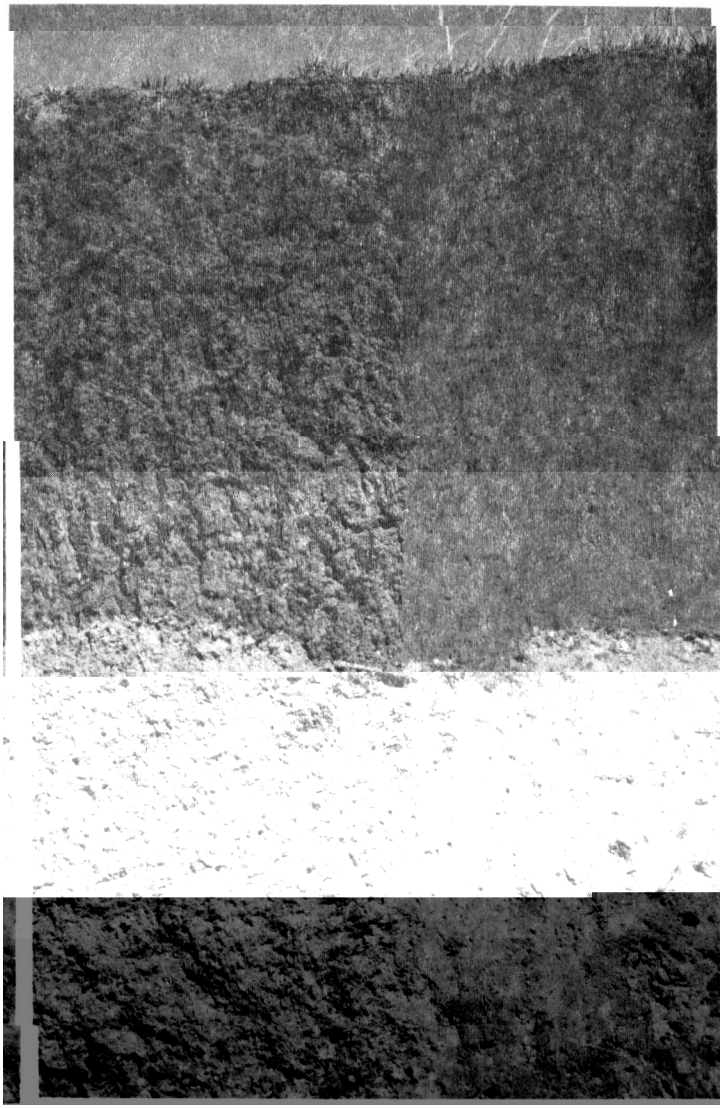


Figure 10.—Profile of Olton clay loam showing distinct layer of

threads, soft masses, and hard concretions of calcium carbonate. The B25tca horizon is reddish yellow or red. It is 10 to 30 percent, by volume, calcium carbonate.

Olton clay loam, 0 to 1 percent slopes (OtA).—This

300 feet apart, and they can be crossed by farm machinery. Also included are some areas of soils that are less than 15 percent calcium carbonate, a few areas of soils that are leached free of carbonates to a depth of

B22—35 to 55 inches, brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak, coarse, prismatic structure parting to weak, fine, subangular blocky; slightly hard, friable; visible films and threads of calcium carbonate; calcareous; moderately alkaline; gradual, smooth boundary.

B23—55 to 64 inches, light-brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak, coarse, prismatic structure; slightly hard, very friable; few visible films and threads of calcium carbonate; calcareous; moderately alkaline.

The A horizon is 10 to 20 inches thick and is brown or dark brown. The B2 horizon is reddish-brown, brown, and light-brown loam to sandy clay loam. Calcium carbonate ranges from a few films, threads, and concretions to as much as 10 percent, by volume. In some areas buried layers of different texture and different colors are at a depth of more than 40 inches.

Paloduro loam, 0 to 1 percent slopes (PaA).—This nearly level soil is on broad plains on uplands. Areas are 10 acres to as large as 400 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are some areas of Amarillo, Berda, Flomot, and Mobeetie soils. Also included are some areas of soils that have a surface layer of fine sandy loam 6 to 14 inches thick. Some areas of soils that have a dark-colored surface layer to a depth of more than 20 inches are also included.

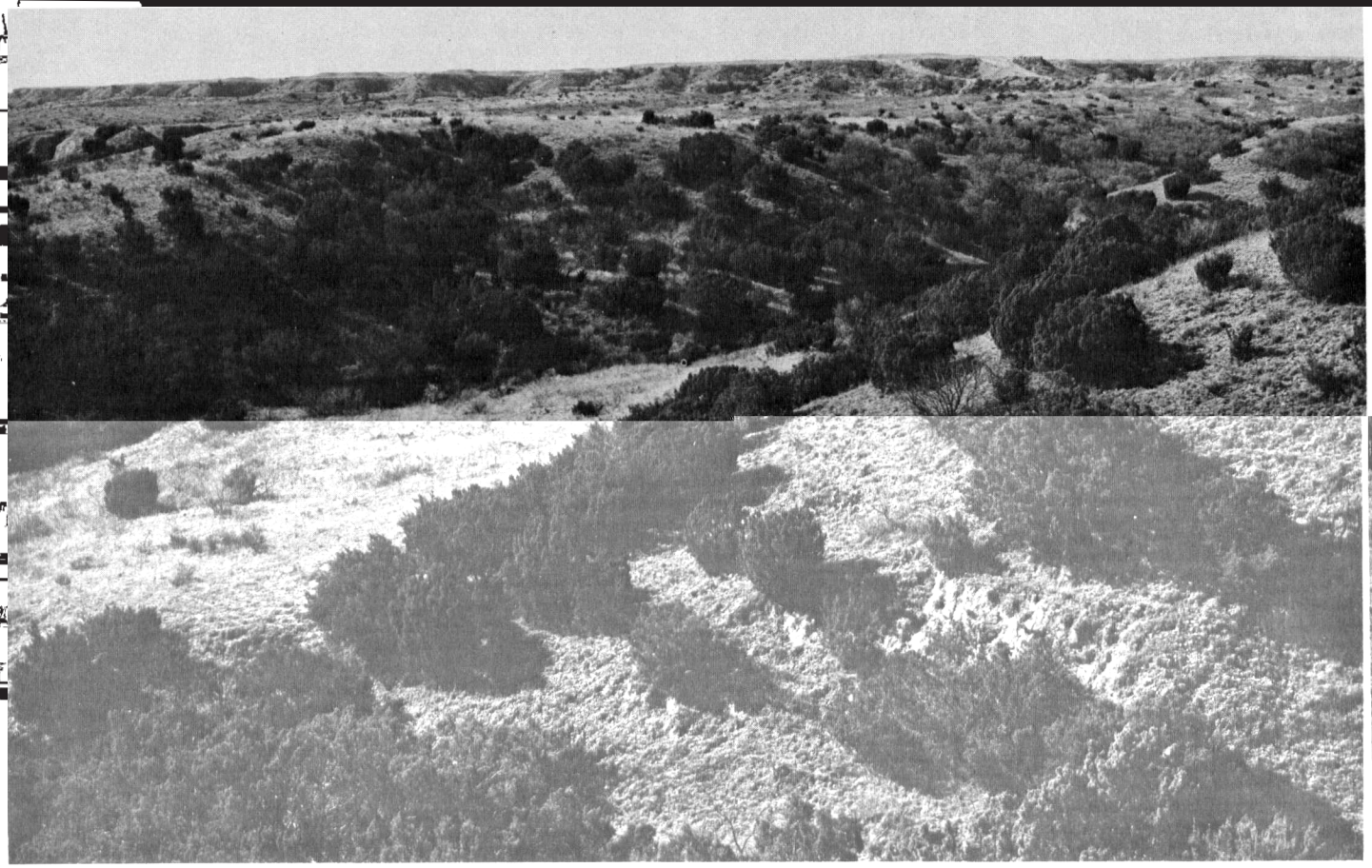
This Paloduro soil is used mostly for crops. A few areas are irrigated. The rest is used as range. Cotton, grain sorghum, and wheat are the main crops. The main concerns in management are maintaining tilth, controlling soil blowing, and conserving moisture. The hazard of soil blowing is moderate, and the hazard of erosion is slight.

Using crops in the cropping system that produce a large amount of crop residue and leaving this residue

C—27 to 60 inches, light-brown (7.5YR 6/4) very gravelly loamy sand, brown (7.5YR 5/4) moist; massive; soft, very friable; 70 percent, by volume, gravel;

knolls and hills. A Polar soil in this unit has the profile described as representative of the series.

The Paloduro soils are in concave-shaped valleys



Portales Series

The Portales series consists of deep, nearly level, loamy soils on uplands. These soils are in areas in and around playa lake depressions and in some isolated areas on the bottom of draws. They formed in loamy, calcareous material.

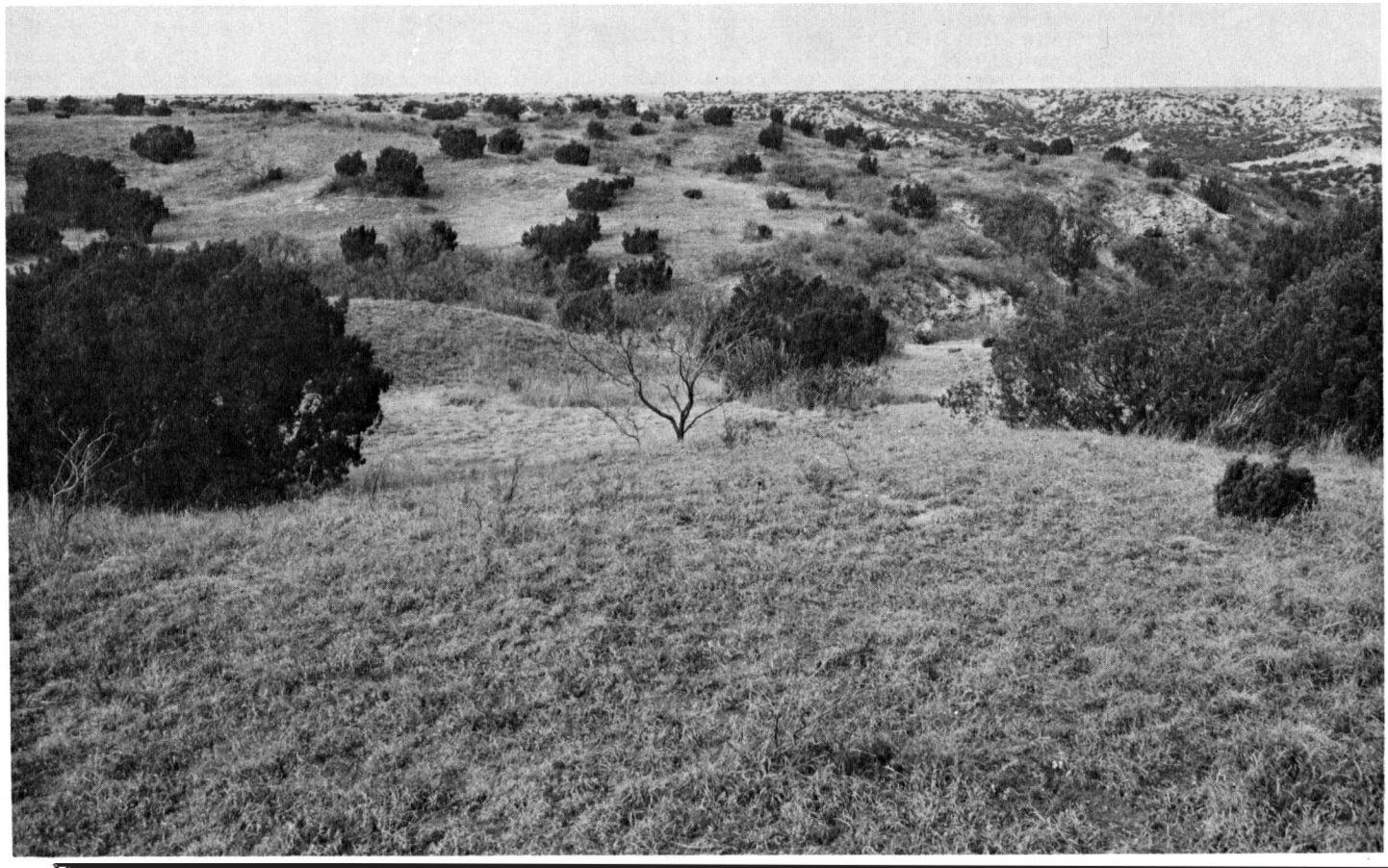
In a representative profile the surface layer is grayish-brown, calcareous loam about 12 inches thick. Below this is about 15 inches of grayish-brown, calcareous loam that has common worm casts. The next layer is about 24 inches of very pale brown clay loam that is about 20 percent calcium carbonate. The underlying material is

areas of Drake and Estacado soils and some areas of a soil that is similar to Portales soil but that has a lighter colored surface layer. In some areas this soil makes up as much as 30 percent of a mapped area. Also included are a few isolated areas of soils that are fine sandy loam and a few areas of soils that have a surface layer leached free of carbonates and have no layer of calcium carbonate accumulation.

This Portales soil is used mostly for crops. Most cultivated areas are irrigated, but a few are dry-farmed. Cotton, grain sorghum, and wheat are the main crops. The main concerns in management are controlling soil blowing and conserving moisture. Run-

B22tca—30 to 60 inches, reddish-yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; weak,

1 mile or more long. Most areas follow the margin of the High Plains. The soils are in irregular patterns and



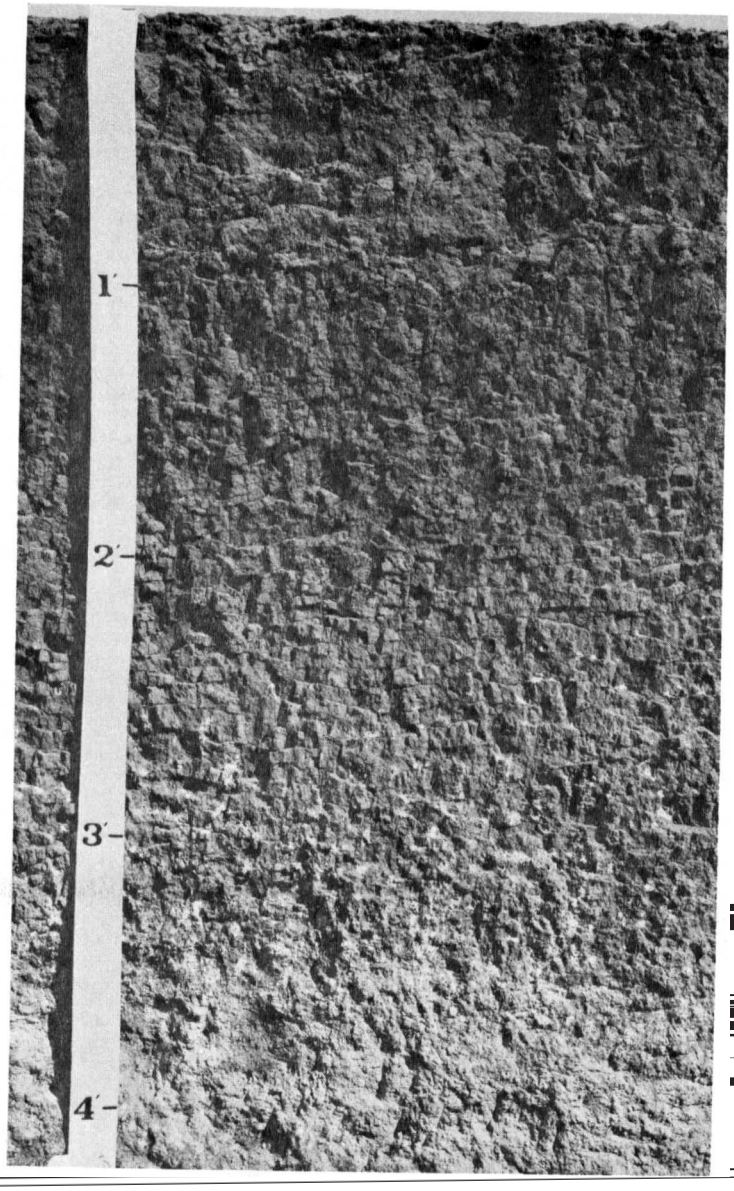
lands. These soils formed in caliche beds of different thicknesses. In some places surface layers formed in

Representative profile of Potter loam in an area of Potter soils, 2 to 20 percent slopes, 3 miles east of

Figure 15.—**Area of Potter soils, 2 to 20 percent slopes.**

The next layer is about 17 inches of pink clay loam that

structure; very hard, firm; few fine pores and old



of soils that border Olton soils and are dark colored to a depth of less than 20 inches are also included.

This Pullman soil is used mostly for crops. Most cultivated areas are irrigated, but a few areas are dryfarmed. Cotton, grain sorghum, soybeans, vegetables, and wheat are the main crops. The main concerns in management are maintaining tilth, controlling erosion, and conserving moisture. Runoff is slow. The hazards of soil blowing and erosion are slight.

Using crops in the cropping system that produce a large amount of crop residue and leaving this residue on the surface help to maintain tilth, prevent soil blowing, and conserve moisture. Avoiding tillage operations when the soil is wet helps to maintain tilth. An example of a suitable cropping system is cotton followed by grain sorghum, wheat, or some other high-residue crop every other year.

In areas where this soil is irrigated, a properly designed surface irrigation system is needed to provide adequate water for crops and to prevent soil and water losses. Capability unit IIIe–4, dryland, and IIs–1, irrigated; Clay Loam range site.

Pullman clay loam, 1 to 3 percent slopes (PuB).—This gently sloping soil is in narrow areas that border playa depressions and drainageways. Most areas are small in size, but some are as large as 200 acres. Slopes are dominantly 1 to 2 percent.

The surface layer is brown clay loam about 5 inches thick. The next layer is about 22 inches of brown clay that is noncalcareous in the upper part and calcareous in the lower part. Below this is calcareous clay about

signed irrigation system is needed to provide adequate water for crops and to prevent soil and water losses. Using diversion terraces and grassed waterways, terracing, and contour farming help to control erosion and conserve moisture. Capability unit IIIe–1, dryland, and IIIe–1, irrigated; Clay Loam range site.

Quinlan Series

The Quinlan series consists of shallow, sloping to strongly sloping, loamy soils on uplands. These soils formed in loamy, calcareous material that weathered from weakly consolidated sandstone.

In a representative profile the surface layer is reddish-brown, calcareous loam about 6 inches thick. The next layer is red, calcareous loam about 12 inches thick. The underlying material is red, weakly cemented, calcareous sandstone that extends to a depth of 60 inches.

Quinlan soils are well drained. Runoff is medium to rapid, and permeability is moderately rapid. Available water capacity is low.

These soils are used as range and wildlife habitat.

In Floyd County, Quinlan soils are mapped only with Obaro soils.

Representative profile of Quinlan loam in an area of Obaro and Quinlan soils, 5 to 12 percent slopes, 11.4 miles east and northeast of Cedar Hill on Farm Road

97 and 50 feet north of the road, in range:

A1—0 to 6 inches, reddish-brown (2.5YR 5/4) loam, dark reddish brown (2.5YR 3/4) moist; weak, medium, granular structure; slightly hard, friable; many roots; calcareous; moderately alkaline; gradual, wavy boundary.

3/6) moist; weak, medium, granular structure; slightly hard, friable; many roots; few sandstone fragments; calcareous; moderately alkaline; gradual, wavy boundary.

C—18 to 60 inches, red (2.5YR 5/6), weakly cemented, calcareous sandstone, dark red (2.5YR 3/6) moist.

The solum ranges from 10 to 20 inches in thickness. The A1 horizon is reddish brown, yellowish red, and red and ranges from loam to silt loam and very fine sandy loam. The B2 horizon is reddish brown, reddish yellow, yellowish red, red, and light red. It is mainly loam but ranges to silt loam and very fine sandy loam and has bits of sandstone and in some areas a few calcium carbonate concretions. The C horizon is weakly cemented sandstone or siltstone. Blue-

Figure 17.—**Profile of Randall clay showing slickensides and tilted, blocky structure.**

Randall soils are somewhat poorly drained. Permeability is very slow, and available water capacity is

lar blocky structure parting to very fine, angular blocky; few intersecting parallelepipeds about ½ inch to 1½ inches long; extremely hard, very firm, very sticky and very plastic; common fine roots through peds; mildly alkaline; diffuse, wavy boundary.

A13—20 to 50 inches, dark-gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate, fine and medium, angular blocky structure; many parallelepipeds ½ to 1½ inches long tilted about 5 to 30 degrees from the horizontal, away from the center of the microdepression toward the microknoll; common slickensides that have angles as much as 30 degrees from the horizontal and as much as 3 feet across the long axis; very hard, very firm; few, fine, strongly cemented concretions of calcium carbonate; mildly alkaline; gradual, wavy boundary.

AC1—50 to 68 inches, gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; about 30 percent medium, faint and distinct mottles of gray (N 6/) and light

15 feet apart, and the microhighs are 2 to 10 inches higher than the microlows.

Included with this soil in mapping are small areas of Lofton soils that are adjacent to playa lakes. Also included are areas of Estacado and Mansker soils which surround smaller playa lakes.

This Randall clay is used mostly as range or wildlife habitat. Because this soil is in low areas, it receives runoff from soils in surrounding areas. Most areas are covered by water several weeks to several months each year. A few areas that have been drained are cultivated. Cotton, grain sorghum, and wheat are the main crops. The main concerns in management are maintaining tilth and controlling soil blowing. The hazard of soil blowing is moderate.

Using crops in the cropping system that produce a

[redacted]

3 to 8 percent slopes, 10.6 miles east and northeast of Cedar Hill on Farm Road 97, then 4.4 miles north on Farm Road 1065 and 100 feet east of the road, in range:

A1—0 to 13 inches, reddish-brown (5YR 5/4) loamy fine sand, reddish brown (5YR 4/4) moist; single grained; loose; many fine roots; neutral; clear, smooth boundary.

[redacted]

control program should allow for planned areas of wildlife habitat. Capability unit VIe–1, dryland; Sandy range site.

Tulia Series

The Tulia series consists of deep, sloping to strongly sloping, loamy soils on uplands. These soils formed in

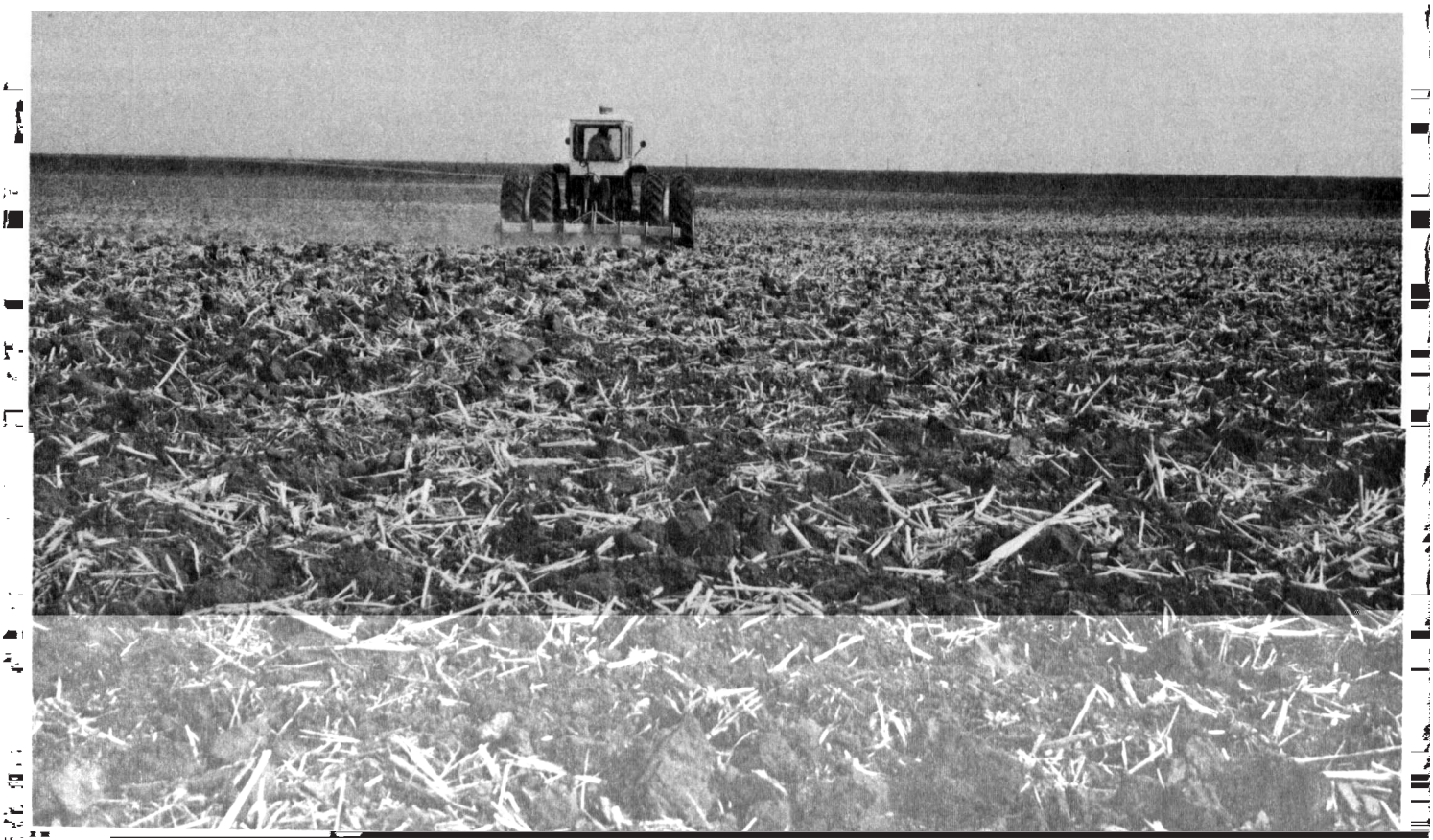
[redacted]

Use and Management of the Soils

This section describes general management for crops, explains the capability classification used by the Soil Conservation Service, gives predicted yields for the major crops on dryland and irrigated soils, and discusses range management and management of the soils for windbreaks. Management for individual mapping units is included in the section "Descriptions of the Soils." This section also provides interpretations of the soils for wildlife habitat and recreational develop-

cropping system that incorporates the use of crops that produce a large amount of residue. The rotation of wheat or grain sorghum with cotton is adequate on most soils. In steeper areas, the continuous use of close-drilled small grains or feed crops is adequate to protect the soils.

Controlling soil blowing.—The hazard of soil blowing on some of the soils in Floyd County is moderate to severe. The soils that are most susceptible are the soils that have a surface layer of sand and sandy loam



adequately protects most soils from soil blowing (fig. 19).

Growing a cover crop and stripcropping are also useful methods of controlling soil blowing. Keeping a cover of plants reduces the wind velocity on the soil

sion terraces, and natural drainageways can empty in the grassed waterways and dispose of excess runoff. To be effective, grass in the waterways should be protected from fire and excessive grazing.

Maintaining crop residue on the soil surface also

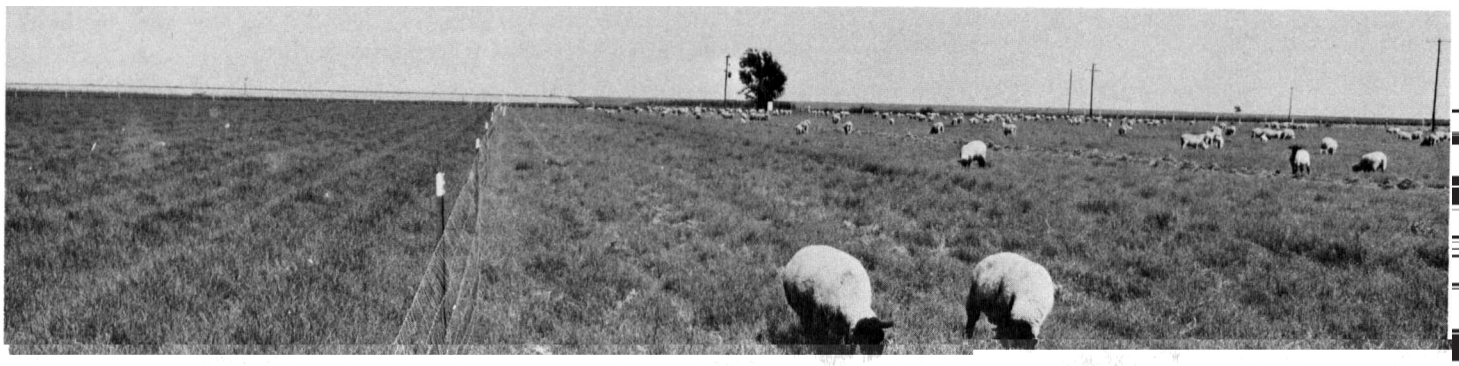
Figure 20.—**Furrow irrigation of grain sorghum on Pullman clay loam. Using gated pipe for irrigation conserves water.**

are Midland bermudagrass, side-oats grama, switchgrass, indiangrass, and other tall grasses. Proper management of pasture includes fertility maintenance, water management, and rotation grazing (fig. 21).

Capability grouping

Some readers, particularly those who farm on a large scale, may find it practical to use and manage alike some of the different kinds of soil on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming.

The grouping is based on permanent limitations of soils when used for field crops, the risk of damage when they are so used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to horticultural crops or other crops that require special management.



sively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclass indicates major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclasses are indicated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in some parts of the United States but not in Floyd County, indicates that the chief limitation is climate that is too cold or too dry.

Class I has no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only the subclasses indicated by *w, s,* and *c,* because the soils in it are subject to little or no erosion. These soils have other limitations, however, that restrict their use largely to pasture, range, wildlife habitat, or recreational purposes.

Subclasses are further divided into groups called capability units. These are groups of soils that are enough alike that they are suited to the same crops and pasture plants, they require about the same management, and they have generally similar productivity and other response to management. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIe–4.

The eight classes in the capability system and the subclasses and the units in Floyd County are described in the list that follows. The unit designation for each soil is given in the "Guide to Mapping Units."

sloping fine sandy loams to loams that are well drained and moderately permeable.

Unit IIIe–4. Deep, nearly level clay loams that are well drained to moderately well drained and very slowly permeable.

Unit IIIe–5. Deep, nearly level loams to clay loams that are well drained and moderately permeable to moderately slowly permeable.

Class IV. Soils have very severe limitations that reduce the choice of plants or require very careful management, or both.

Subclass IVe. Soils are subject to very severe erosion if they are cultivated and not protected.

Unit IVe–1. Deep, gently sloping fine sandy loams to clay loams that are well drained and moderately permeable.

Unit IVe–2. Deep, gently sloping fine sandy loams that are well drained and moderately permeable.

Unit IVe–3. Deep, gently sloping fine sandy loams to clay loams that are well drained and moderately permeable.

Unit IVe–4. Deep, nearly level to gently sloping fine sandy loams that are well drained and moderately rapidly permeable.

Unit IVe–5. Deep, gently sloping loams that are well drained and moderately permeable.

Subclass IVs. Soils are very severely limited because of tilth.

Unit IVs–1. Deep, nearly level clays that are somewhat poorly drained and very slowly permeable.

Class V. Soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife habitat.

Subclass VIs. Soils are severely limited because of gravel.

Unit VIs–1. Deep, gently sloping to steep

drained to excessively drained and moderately permeable to moderately rapidly permeable

Unit IIIe–2. Deep, gently sloping loams to clay loams that are well drained and moderately permeable to moderately slowly per-

Unit IIIe–3. Deep, nearly level to gently sloping fine sandy loams that are well drained

TABLE 2.—*Predicted average yields per acre for principal crops under high-level management*

[Dashes in a column indicate that the soil is not suitable or the crop is not commonly grown on the soil]

Soil	Cotton (lint)		Grain sorghum		Wheat	
	Dryland	Irrigated	Dryland	Irrigated	Dryland	Irrigated
	Lb	*Lb*	*Lb*	*Lb*	*Bu*	*Bu*
Amarillo fine sandy loam, 0 to 1 percent slopes	200	900	1,350	6,500	15	60
Amarillo fine sandy loam, 1 to 3 percent slopes	195	850	1,100	5,500	15	50
Amarillo fine sandy loam, 3 to 5 percent slopes	150	550	800	4,000	10	35
Berda loam, 1 to 3 percent slopes	175	675	1,250	4,500	15	45
Berda loam, 3 to 5 percent slopes	----	----	900	3,500	10	35
Bippus clay loam, 0 to 1 percent slopes	250	850	1,750	7,500	20	60
Drake soils, 1 to 3 percent slopes	100	600	600	3,500	10	40
Drake soils, 3 to 5 percent slopes	----	----	----	3,000	----	30
Estacado clay loam, 0 to 1 percent slopes	200	800	1,250	5,500	15	55
Estacado clay loam, 1 to 3 percent slopes	150	750	1,250	5,000	15	45
[illegible]	150	500	900	3,500	15	30

not change so long as the environment remains unchanged. The climax vegetation consists of the plants that were growing on a given soil when the region was first settled. If cultivated crops are not grown, the most productive combination of forage plants on a range site is generally the climax vegetation.

Decreasers are plants in the climax vegetation that tend to decrease in relative amount under close grazing. They generally are the tallest and most productive perennial grasses and forbs and the most palatable to

Increasers are plants in the climax vegetation that increase in relative amount as the more desirable decreaser plants are reduced by close grazing. They are commonly shorter than decreasers and are generally less palatable to livestock.

Invaders are plants that cannot compete with plants in the climax plant community for moisture, nutrients, and light. Hence, invaders come in and grow along with increasers after the climax vegetation has been reduced by grazing. Many are annual weeds, and some are shrubs that have some grazing value, but others have little value for grazing.

Four range condition classes are used to indicate the degree of departure from the potential, or climax, vegetation brought about by grazing or other uses. Range condition class indicates the present condition of

principal invaders on the sites are named. Also given is an estimate of the potential average annual acre yield of air-dry herbage in both wet and dry years for each site where it is in excellent condition. The soils in each site can be determined by referring to the "Guide to Mapping Units" at the back of this survey.

CLAY LOAM RANGE SITE

This range site is made up mainly of deep, nearly level to gently sloping, loamy soils on smooth, upland

favorite area for grazing. Permeability is moderately slow to very slow, and available water capacity is high. The hazard of soil blowing is slight, and the hazard of erosion is slight to moderate.

The climax plants are short and mid grasses. The approximate kinds of plants in percentage by weight are blue grama, 35; buffalograss, 25; vine-mesquite, 10; perennial three-awns, 5; tobosagrass, 5; side-oats grama, 5; feathery bluestems, 5; sand dropseed, 5; and forbs, 5.

Continuous overgrazing results in an immediate decrease in blue grama and an increase in buffalograss. Further site deterioration results in invasion by perennial three-awns, Texas grama, hairy tridens, prickly-pear, and mesquite. When this site is in fair or poor condition and during years that have a wet spring,

grazed out. The site is an excellent source of forage for deer. The amount of herbage produced on this site is influenced by the annual rainfall as well as by the degree of past erosion. Where the site is in excellent condition, the average annual yield of air-dry herbage

to medium. The hazard of soil blowing is moderate, and the hazard of erosion is severe.

The climax plants are dominantly mid grasses and lesser amounts of short grasses. The approximate kinds of plants in percentage by weight are blue grama, 25;

ROUGH BREAKS RANGE SITE

Berda and Potter soils, steep, are the only soils in this site. These very shallow to deep, steep, loamy soils are mostly within and along the Caprock Escarpment. Permeability is moderate, and available water capacity is medium to high. The hazard of soil blowing is mod-

not feasible, because there is a hazard of soil blowing if these methods are used. The site responds favorably to chemical control of shin oak. It has the ability to return to good to excellent condition in a few years if management is good and if a seed source is available. Where response is slow, overseeding by the best known

The approximate kinds of climax plants in percentage by weight are side-oats grama, 20; little bluestem,

This site is widely variable in production from year to year. This variation is influenced by the amount of

brush. Mechanical as well as chemical methods are effective, and grazing is deferred following these practices to permit grass recovery.

Where this site is in excellent condition, the average annual yield of air-dry herbage ranges from 2,400 pounds per acre in wet years to 1,500 pounds per acre in dry years. About two-thirds of this herbage can be used by livestock and wildlife.

VALLEY RANGE SITE

This range site is made up of deep, nearly level, loamy soils in low areas of major draws. Although flooded from time to time, it is under water for only a short period. Any damage to vegetation is ordinarily from sedimentation rather than from wetness. Permeability is moderate, and available water capacity is very high. The hazards of soil blowing and erosion are slight.

The climax plants are dominantly mid grasses and

Wildlife [3]

In Floyd County, the main kinds of wildlife are white-tailed deer, mule deer, aoudad, turkey, bobwhite quail, scaled (blue) quail, dove, cottontail rabbit, jackrabbit, and numerous kinds of nongame birds. Raccoon, fox, skunk, opossum, and other furbearers live in the county. Predators commonly found in the county are bobcat and coyote. Playa lakes, streams, ponds, and grainfields attract ducks and geese during migration. Most farm and ranch ponds are stocked with channel catfish, black bass, and sunfish. Fish and wildlife resources are of minor economic importance to landowners in this county. A few landowners lease their land for hunting of aoudad, deer, turkey, and quail.

Soils directly influence the kind and amount of vegetation and the amount of water available. In this way they indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the growth of wildlife habitat are (1) thickness of soil useful to

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

Soil series and map symbols	Elements of wildlife habitat				Kinds of wildlife	
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Open-land	Rangeland
Amarillo: AfA, AfB, AfC	Fair	Fair	Fair	Fair	Fair	Fair.
Berda:						
BeB, BeC, BeD	Fair	Fair	Fair	Fair	Fair	Fair.
BoE, BPG	Poor	Fair	Fair	Fair	Fair	Fair.
For Paloduro part of BoE, see Paloduro series; for Potter part of BPG, see Potter series.						
Bippus:						
BtA	Good	Good	Good	Good	Good	Good.
Bw	Poor	Fair	Good	Good	Fair	Good.
Drake: DrB, DrC	Fair	Fair	Fair	Fair	Fair	Fair.
Estacado: EsA, EsB	Fair	Fair	Fair	Fair	Fair	Fair.
Flomot:						
FoB, FoC	Fair	Fair	Fair	Fair	Fair	Fair.
FoD	Poor	Fair	Fair	Fair	Fair	Fair.
Latom: LaE	Poor	Poor	Poor	Poor	Poor	Poor.
For Rock outcrop part of LaE, see Rock outcrop.						
Likes: LkD	Poor	Fair	Good	Fair	Fair	Fair.
Lincoln: Ln	Very poor	Poor	Fair	Fair	Poor	Fair.
Lofton: Lo	Fair	Fair	Fair	Fair	Fair	Fair.
Mansker: MaB, MaC	Fair	Fair	Fair	Fair	Fair	Fair.
Mobeetie: MoB	Fair	Fair	Fair	Fair	Fair	Fair.
Obaro: ObD	Poor	Fair	Good	Fair	Fair	Fair.
For Quinlan part of ObD, see Quinlan series.						
Olton: OtA, OtB	Fair	Fair	Fair	Fair	Fair	Fair.
Paloduro:						
PaA	Fair	Fair	Fair	Fair	Fair	Fair.
Paloduro part of BoE and PdG	Poor	Fair	Fair	Fair	Fair	Fair.
Polar: PdG	Poor	Poor	Fair	Fair	Poor	Fair.
For Paloduro part of PdG, see Paloduro series.						
Portales: PmA	Fair	Fair	Fair	Fair	Fair	Fair.
Posey: PsD	Poor	Fair	Fair	Fair	Fair	Fair.
For Tulia part of PsD, see Tulia series.						
Potter: PtE	Very poor	Very poor	Poor	Very poor	Very poor	Very poor.
Pullman: PuA, PuB	Fair	Fair	Fair	Fair	Fair	Fair.
Quinlan	Poor	Poor	Fair	Poor	Poor	Poor.
Mapped only with Obaro soils.						
Randall: Ra	Very poor	Poor	Poor	Very poor	Poor	Very poor.
Rock outcrop	Very poor	Very poor	Poor	Very poor	Very poor	Very poor.
Mapped only with Latom soils.						
Springer: SpD	Poor	Fair	Good	Poor	Fair	Fair.
Tulia	Poor	Fair	Fair	Fair	Fair	Fair.
Mapped only with Posey soils.						

The elements of wildlife habitat rated in table 3 are briefly described in the following paragraphs.

Grain and seed crops are crops that produce annual [redacted] in the form of fruits, nuts, buds, or browse. Such plants commonly grow in their natural environment, but they may be planted and developed through wild-life management programs. Typical kinds of plants in

Shallow water developments are impoundments or [illegible] table 4 the soils of Floyd County are rated according to

limitations that affect their suitability for camp areas, picnic areas, playgrounds, and paths and trails.

The soils are rated as having slight, moderate, or severe limitations for the specified uses. For all of these ratings it is assumed that a good cover of vege

TABLE 4.—*Degree of limitation and soil features affecting recreational development*

[Certain terms used to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and other terms used to rate soils]

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Amarillo:				
AfA	Slight	Slight	Slight	Slight.
AfB, AfC	Slight	Slight	Moderate: slope	Slight.
Berda:				

given to the kinds of trees selected. Olton and Pullman soils are the most productive for trees. Deciduous trees that are adapted to these soils are Siberian elm, Russian-olive, honeylocust, green ash, and osageorange. Coniferous trees that are adapted are oriental arborvitae, eastern redcedar, Rocky Mountain juniper, Arizona cypress, Austrian pine, and ponderosa pine. Estacado and Mansker soils have physical characteristics that restrict the growth of pines and green ash. Drake soils are calcareous loams that are somewhat droughty; however, Siberian elm, osageorange, oriental arborvitae, and eastern redcedar trees grow on them.

The vigorous growth and effectiveness of a windbreak depend greatly upon such factors as supplemental watering, site preparation, and maintenance and spacing of trees. Any tree or shrub, regardless of size or age, must be watered immediately after planting and at frequent intervals thereafter for the first year. Once established, trees can survive and grow well if they are watered during periods of low rainfall. It is desirable to summer-fallow the area to be planted to trees if the soil is not highly erodible. Weeds competition must be kept at a minimum at all times.

tion, shrink-swell potential, grain-size distribution, plasticity, and reaction. Depth to the water table, depth to bedrock, and slope are also important. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built for the purpose of predicting performance of structures on the same [illegible] other locations.

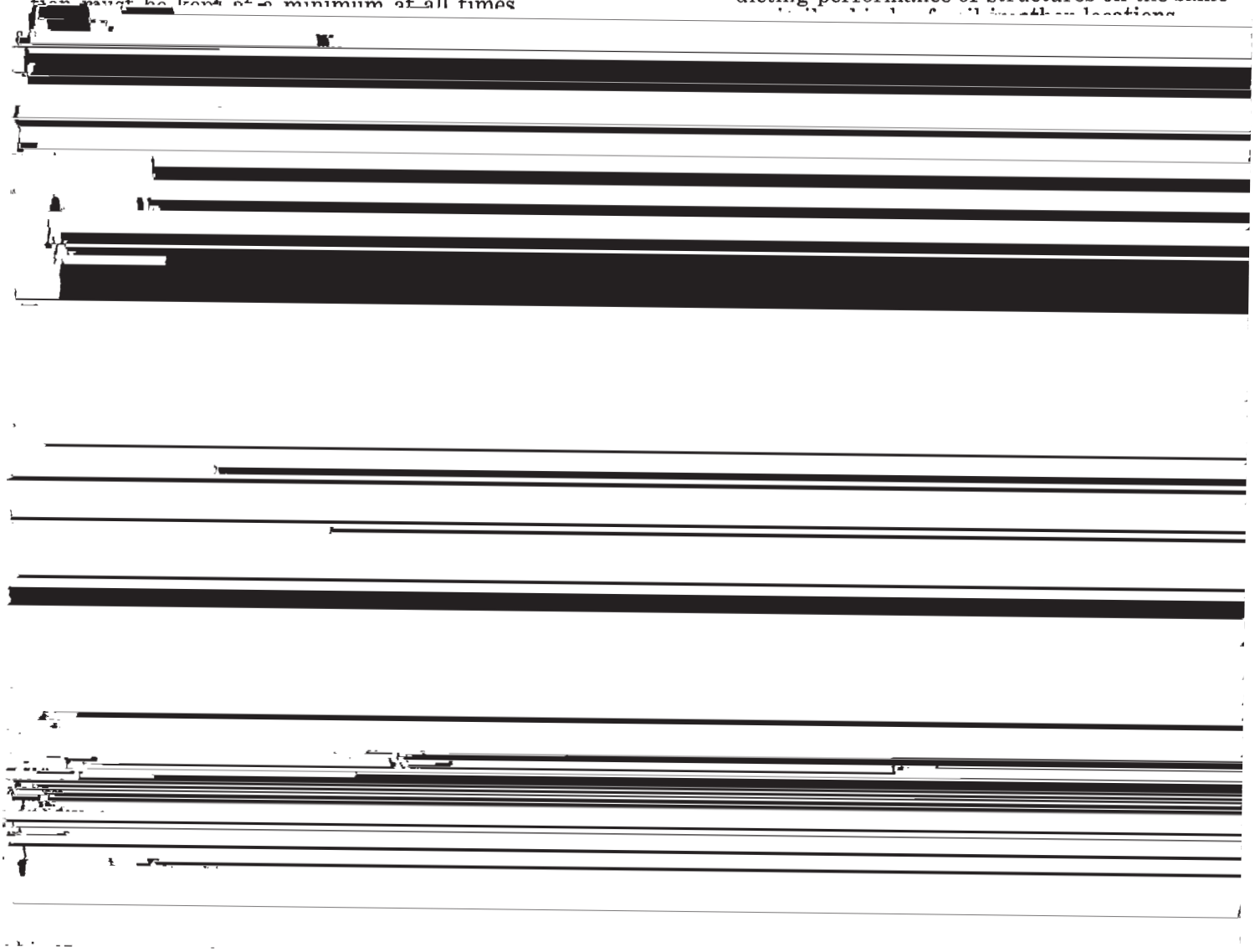


TABLE 5.—*Estimates of soil properties*

[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 instructions for referring to other series that appear in the first column of

Soil series and map symbols	Hydrologic group	Depth to bedrock	Depth from surface	Dominant USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		In	*In*				*Pct*
Amarillo: AfA, AfB, AfC	B	>60	0–9	Fine sandy loam	SM or SM-SC	A–4 or A–2	
			9–40	Sandy clay loam	SC or CL or SM-SC, CL-ML	A–6, A–4	
			40–84	Sandy clay loam	SC or CL	A–6, A–4	
*Berda: BeB, BeC, BeD, BoE, BPG. For Paloduro part of BoE, see Paloduro series; for Potter part of BPG, see Potter series.	B	>60	0–62	Loam	CL or SC	A–4 or A–6	
Bippus: BtA, Bw	B	>60	0–66	Clay loam and sandy clay loam.	CL or ML, CL-ML	A–4 or A–6	
Drake: DrB, DrC	B	>60	0–60	Loam or clay loam	SC or CL	A–4 or A–6	
Estacado: EsA, EsB	B	>60	0–15	Clay loam	CL	A–6	
			15–26	Clay loam	CL	A–6 or A–7–6	
			26–82	Clay loam and silty clay loam.	CL	A–6 or A–7–6	
Flomot: FoB, FoC, FoD	B	>60	0–7	Fine sandy loam	SM or SM-SC	A–2–4 or A–4	
			7–37	Loam	CL-ML, CL, SC, or SM-SC	A–4 or A–6	
			37–70	Loam	CL-ML, CL, SC, or SM-SC	A–4 or A–6	
Latom: LaE Rock outcrop part is too variable to rate.	D	4–16	0–16	Fine sandy loam	SM-SC or SM	A–2–4 or A–4	0–5
			16–25	Strong cemented calcareous sandstone.			
Likes: LkD	A	>60	0–26	Loamy fine sand	SM or SM-SC, SP-SM	A–2–4, A–3	
			26–60	Fine sand	SM or SM-SC, SP-SM	A–2–4, A–3	
Lincoln: Ln	A	>60	0–14	Fine sandy loam	SM	A–4	
			14–65	Fine sand	SM	A–2	
Lofton: Lo	D	>60	0–7	Clay loam	CL	A–6 or A–7–6	
			7–73	Clay	CL or CH	A–7	
			73–86	Silty clay	CL	A–6 or A–7–6	

significant in engineering

soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the this table. The symbol > means more than, the symbol < means less than]

Percentage passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to uncoated steel
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							
				Pct		*In per hr*	*In per in of soil*	*pH*		
----------	100	95–100	35–50	17–25	2–6	2.0–6.0	0.11–0.15	6.6–7.8	Low ----------	Moderate.
----------	100	95–100	36–65	25–36	7–20	0.6–2.0	0.15–0.17	7.4–8.4	Low ----------	Moderate.
90–100	90–100	80–95	36–60	20–32	8–15	0.6–2.0	0.11–0.15	7.9–8.4	Low ----------	Moderate.
90–100	90–100	80–95	36–70	20–35	8–20	0.6–2.0	0.14–0.17	7.9–8.4	Low ----------	Moderate.
100	95–100	80–100	51–85	25–40	7–20	0.6–2.0	0.16–0.20	7.9–8.4	Low ----------	Moderate.
----------	100	70–90	40–70	20–35	9–15	0.6–2.0	0.10–0.15	7.9–8.4	Low ----------	High.
100	98–100	95–100	51–85	25–40	11–25	0.6–2.0	0.14–0.18	7.9–8.4	Low ----------	Moderate.
95–100	95–100	85–100	55–90	30–42	11–25	0.6–2.0	0.12–0.16	7.9–8.4	Low ----------	Moderate.

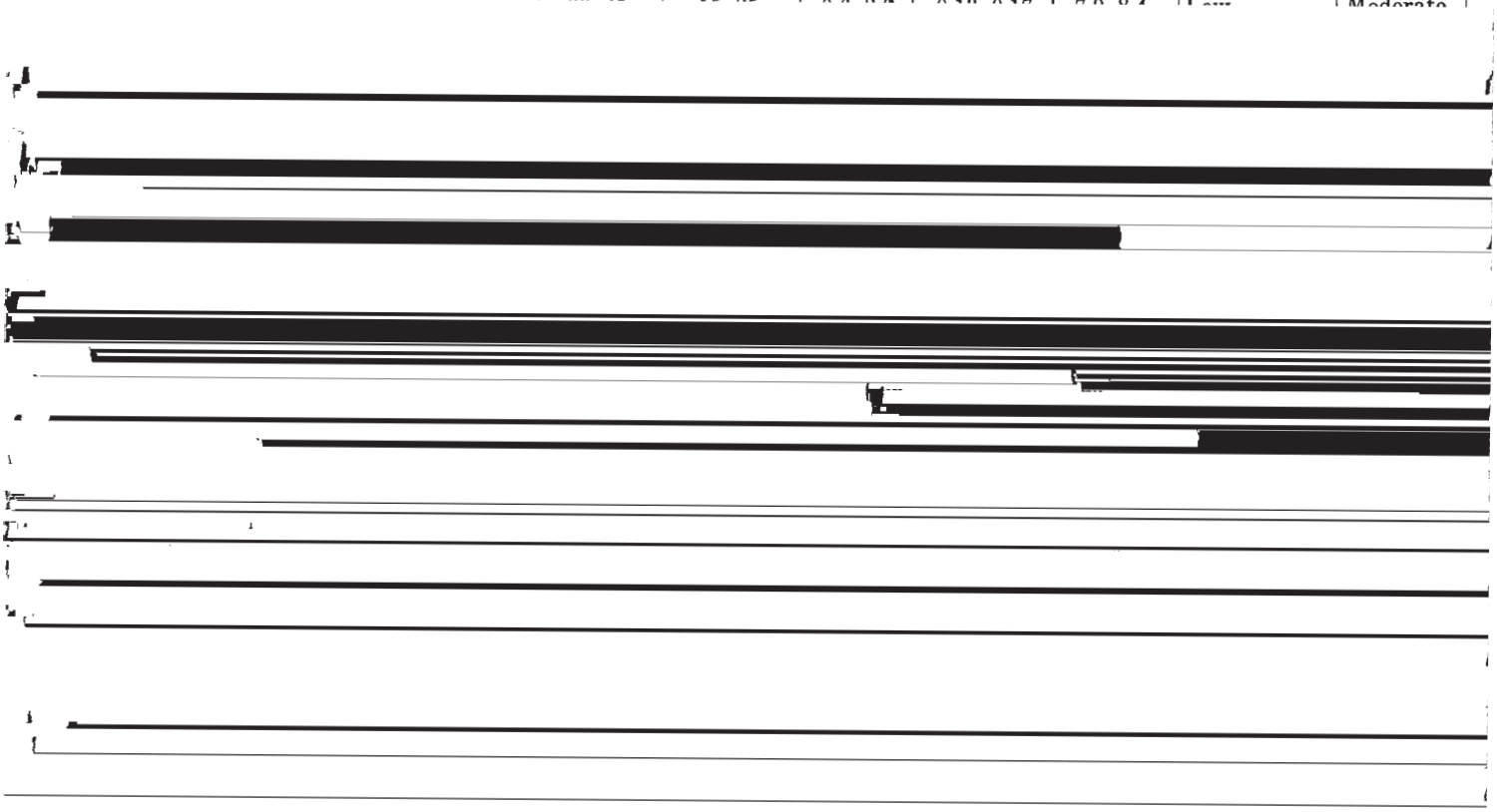


TABLE 5.—*Estimates of soil properties*

Soil series and map symbols	Hydrologic group	Depth to bedrock	Depth from surface	Dominant USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		In	*In*				*Pct*
Mansker: MaB, MaC	B	>60	0–14	Clay loam	CL-ML, CL, SM-SC, SC	A–4 or A–6	
			14–35	Clay loam	CL or SC	A–4 or A–6	
			35–75	Clay loam	CL	A–4 or A–6	
Mobeetie: MoB	B	>60	0–72	Fine sandy loam and loamy fine sand.	SM-SC, CL-ML, ML or SM	A–4	0–5
*Obaro: ObD	B	20–42	0–34	Loam	CL-ML, CL	A–4 or A–6	
For Quinlan part, see Quinlan series.			34–60	Weakly cemented sandstone.	ML or CL-ML	A–4	
Olton: OtA, OtB	C	>60	0–9	Clay loam	CL	A–4 or A–6	
			9–44	Clay and clay loam	CL	A–6 or A–7	
			44–84	Clay loam	CL	A–6	
Paloduro: PaA	B	>60	0–64	Loam and fine sandy loam.	CL or SC	A–4 or A–6	
*Polar: PdG	B	>60	0–8	Gravelly sandy loam.	GM-GC, GM, SM, SM-SC	A–1, A–2	0–5
For Paloduro part, see Paloduro series.			8–60	Very gravelly sandy loam and very gravelly loamy sand.	GM-GC, GP-GM, or SM, SP-SM	A–1, A–2	0–5
Portales: PmA	B	>60	0–27	Loam	CL	A–4	
			27–64	Clay loam and sandy clay loam.	SC or CL	A–4 or A–6	
*Posey: PsD	B	>60	0–8	Loam	CL-ML, CL, ML, SM, or SC, SM-SC	A–4	
For Tulia part, see Tulia series.			8–80	Clay loam	CL or ML	A–4 or A–6	
Potter: PtE	C	4–12	0–6	Loam	ML or CL	A–4 or A–6	
			6–25	Caliche fragments	GM, GC, SM, SC	A–2, A–4 or A–6	
Pullman: PuA, PuB	D	>60	0–8	Clay loam	CL	A–7, A–6	
			8–46	Clay	CL or CH	A–7	
			46–86	Clay loam	CL	A–7–6, A–6	
Quinlan	C	10–20	0–18	Loam	CL-ML or CL	A–4	
Mapped only with Obaro soils.			18–60	Weakly cemented sandstone.			
Randall: Ra	D	>60	0–100	Clay	CH or CL	A–7	

significant in engineering—Continued

Percentage passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to uncoated steel
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	*Pct*		*In per hr*	*In per in of soil*	*pH*		
95–100	95–100	80–95	36–70	20–35	5–20	0.6–2.0	0.14–0.18	7.9–8.4	Low	Moderate.
90–100	90–100	85–95	40–80	20–35	8–20	0.6–2.0	0.10–0.12	7.9–8.4	Low	Moderate.
100	95–100	90–95	51–80	25–40	10–25	0.6–2.0	0.14–0.18	7.9–8.4	Low	Moderate.
95–98	90–95	85–95	40–65	18–25	2–7	2.0–6.0	0.10–0.13	7.9–8.4	Very low	Low.
95–98	92–95	90–95	75–85	25–35	7–15	0.6–2.0	0.12–0.16	7.9–8.4	Low	Low.
95–99	90–99	90–98	60–75	20–26	2–6	0.6–2.0	0.04–0.08	7.9–8.4	Low	Low.
100	95–100	85–100	55–75	20–35	10–20	0.6–2.0	0.15–0.20	6.6–7.8	Low	Moderate.
100	90–100	90–100	70–85	35–50	20–35	0.2–0.6	0.15–0.20	7.4–8.4	Moderate	Moderate.
90–100	90–100	90–100	60–75	25–40	15–30	0.2–0.6	0.10–0.15	7.9–8.4	Moderate	Moderate.
95–100	95–100	80–95	40–60	20–35	8–20	0.6–2.0	0.14–0.17	7.9–8.4	Low	Moderate.
45–75	35–60	30–50	10–25	10–15	2–7	2.0–6.0	0.04–0.09	7.9–8.4	Very low	Very low.
40–70	30–65	20–45	5–20	<20	NP–5	2.0–6.0	0.03–0.07	7.9–8.4	Very low	Very low.
100	95–100	85–95	51–65	15–25	8–10	0.6–2.0	0.14–0.17	7.9–8.4	Low	Low.
95–100	90–95	80–90	45–60	25–35	8–17	0.6–2.0	0.10–0.12	7.9–8.4	Moderate	Low.
98–100	95–100	85–95	36–70	20–35	3–10	0.6–2.0	0.13–0.17	7.9–8.4	Low	Moderate.
95–100	90–95	85–95	51–75	25–40	8–15	0.6–2.0	0.12–0.16	7.9–8.4	Low	Moderate.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 5.—*Estimates of soil properties*

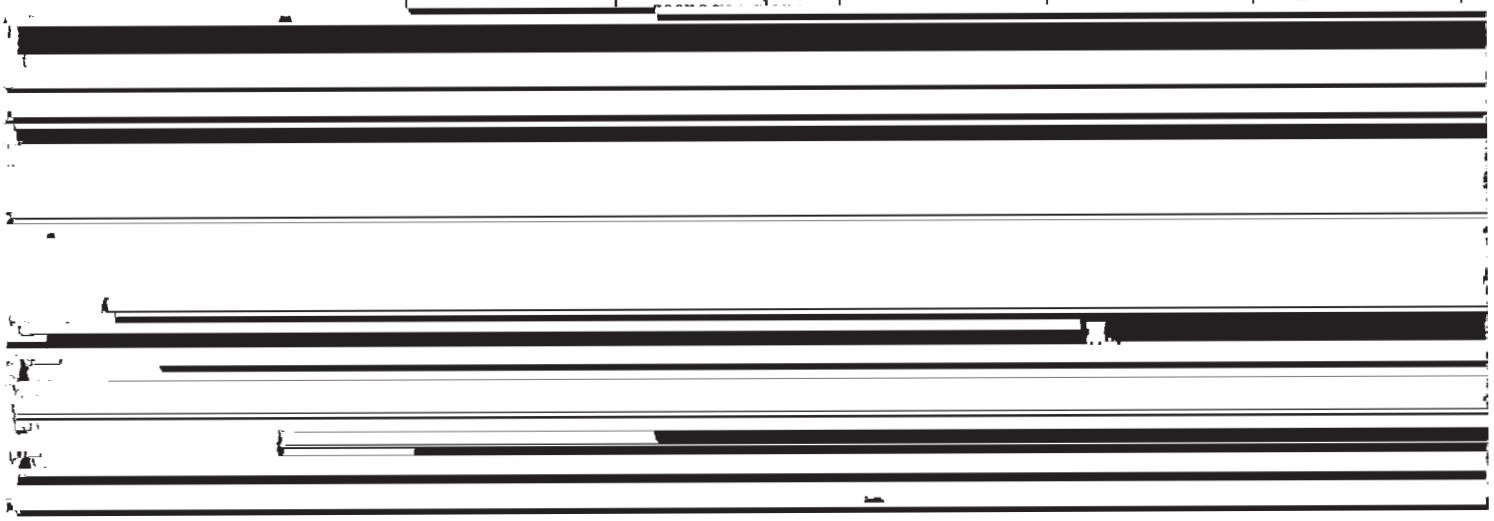
Soil series and map symbols	Hydrologic group	Depth to bedrock	Depth from surface	Dominant USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		In	*In*				*Pct*
Rock outcrop. Mapped only with Latom soils.							
Springer: SpD	B	>60	0–13	Loamy fine sand	SM or SP-SM, SM-SC	A–2–4 or A–3	
			13–84	Fine sandy loam and loamy fine sand.	SM or SM-SC	A–2–4	
Tulia Mapped only with Posey soils.	B	>60	0–9	Loam	CL-ML, CL, SC or SM-SC	A–4 or A–6	
			9–48	Clay loam	SC, CL	A–4 or A–6	
			48–64	Clay loam	CL	A–6 or A–4	

[1] NP=Nonplastic.

TABLE 6.—*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. carefully the instructions for referring to other series that appear in the first column of this table. Certain terms used to other terms used to rate soils]

Soil series and map symbols	Degree and kind of limitation for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill [1]
Amarillo: AfA, AfB, AfC	Slight	Moderate: seepage.	Slight	Slight	Slight
*Berda: BeB	Slight	Moderate:	Slight	Slight	Slight



significant in engineering—Continued

Percentage passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to uncoated steel
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							
				Pct		*In per hr*	*In per in of soil*	*pH*		
100	95–100	70–85	8–25	15–20	NP–4	6.0–20	0.06–0.10	6.6–7.8	Very low	Low.
100	95–100	80–95	12–35	17–23	2–7	2.0–6.0	0.06–0.14	7.4–8.4	Low	Low.
95–100	95–100	85–95	36–70	20–35	5–20	0.6–2.0	0.14–0.18	7.9–8.4	Low	Moderate.
90–100	90–100	85–95	40–80	20–35	9–15	0.6–2.0	0.07–0.12	7.9–8.4	Low	Moderate.
100	95–100	90–95	51–80	25–40	8–20	0.6–2.0	0.14–0.18	7.9–8.4	Low	Moderate.

interpretations

The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and

Degree and kind of limitation for—Continued			Suitability as a source of—		Soil features affecting—	
Local roads and streets	Pond reservoir areas	Embankments, dikes, and levees	Road fill	Topsoil	Irrigation	Terraces and diversions
Moderate, low	Moderate	Moderate	Fair, low	Fair, [illegible]	All features	All features

TABLE 6.—*Engineering*

Soil series and map symbols	Degree and kind of limitation for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill [1]
Estacado: EsA, EsB	Slight	Moderate: seepage.	Moderate: too clayey.	Moderate: low strength.	Moderate: too clayey.
Flomot:					
FoB, FoC	Slight	Severe: seepage	Slight	Slight	Slight
FoD	Moderate: slope.	Severe: seepage; slope.	Moderate: slope.	Moderate: slope.	Slight
Latom: LaE Rock outcrop part is too variable to rate.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Likes: LkD	Slight	Severe: seepage	Severe: too sandy.	Slight	Severe: seepage.
Lincoln: Ln	Severe: floods	Severe: floods; seepage.	Severe: floods	Severe: floods	Severe: floods
Lofton: Lo	Severe: percs slowly.	Slight	Severe: too clayey.	Severe: shrink-swell.	Severe: too clayey.
Mansker:					
MaB	Slight	Moderate: seepage.	Slight	Slight	Moderate: too clayey.
MaC	Slight	Moderate: seepage; slope.	Slight	Slight	Moderate: too clayey.
Mobeetie: MoB	Slight	Severe: seepage	Slight	Slight	Severe: seepage.
*Obaro: ObD For Quinlan part, see Quinlan series.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Slight	Severe: depth to rock.
Olton: OtA, OtB	Moderate: percs slowly.	Slight	Slight	Moderate: low strength; shrink-swell.	Moderate: too clayey.
Paloduro:					
PaA	Slight	Moderate: seepage.	Slight	Moderate: low strength.	Slight
Paloduro part of BoE and PdG.	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: low strength.	Moderate: slope.
*Polar: PdG For Paloduro part, see Paloduro series.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Portales: PmA	Slight	Moderate: seepage.	Slight	Slight	Slight
*Posey: PsD For Tulia part, see Tulia series.	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope.	Slight
Potter: PtE	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: seepage.
Pullman: PuA, PuB	Severe: percs slowly.	Slight	Severe: too clayey.	Severe: shrink-swell.	Severe: too clayey.
Quinlan Mapped only with Obaro soils.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock; slope.	Moderate: depth to rock.
Randall: Ra	Severe: percs slowly.	Slight	Severe: floods; too clayey.	Severe: floods; too clayey.	Severe: floods; too clayey.

interpretations—Continued

Degree and kind of limitation for—Continued			Suitability as a source of—		Soil features affecting—	
Local roads and streets	Pond reservoir areas	Embankments, dikes, and levees	Road fill	Topsoil	Irrigation	Terraces and diversions
Moderate: low strength.	Moderate: seepage.	Fair: piping	Fair: low strength.	Fair: too clayey.	All features favorable.	All features favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: excess lime.	Droughty	Erodes easily.
Moderate: low strength; slope.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: excess lime.	Droughty; slope.	Erodes easily; slope.
Severe: depth to rock.	Severe: depth to rock.	Severe: erodes easily; thin layer.	Poor: thin layer.	Fair: thin layer.	Droughty; slope.	Depth to rock; slope.
Slight	Severe: seepage.	Moderate: piping	Good	Poor: too sandy.	Droughty; erodes easily.	Not needed.
Severe: floods	Severe: seepage.	Moderate: piping	Good	Poor: too sandy.	Floods	Not needed.
Severe: shrink-swell.	Slight	Moderate: unstable fill.	Poor: shrink-swell.	Poor: too clayey.	All features favorable.	Percs slowly.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: excess lime.	Excess lime	All features favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: excess lime.	Excess lime; slope.	Slope.
Moderate: low strength.	Severe: seepage.	Moderate: piping	Fair: low strength.	Good	Erodes easily; seepage.	Erodes easily.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: slope	Rooting depth; slope.	Rooting depth; slope.
Severe: low strength.	Moderate: seepage.	Moderate: piping	Poor: low strength.	Fair: too clayey.	All features favorable.	All features favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Good	All features favorable.	All features favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: slope	Slope	Slope.
Severe: slope	Severe: seepage.	Moderate: piping	Severe: slope	Severe: slope	Slope	Slope.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Good	All features favorable.	All features favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: slope; thin layer.	Slope	Slope.
Severe: slope	Severe: seepage.	Severe: thin layer.	Fair: low strength.	Poor: excess lime; slope.	Droughty; slope.	Slope.
Severe: shrink-swell.	Slight	Moderate: piping	Poor: shrink-swell.	Fair: too clayey.	All features favorable.	All features favorable.
Moderate: depth to rock; slope.	Severe: depth to rock.	Severe: thin layer.	Poor: depth to rock.	Fair: thin layer.	Rooting depth; slope.	Depth to rock.
Severe: shrink-swell.	Slight	Moderate: unstable fill.	Poor: shrink-swell.	Poor: too clayey.	Floods	Not needed.

TABLE 6.—*Engineering*

Soil series and map symbols	Degree and kind of limitation for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill

interpretations—Continued

Degree and kind of limitation for—Continued			Suitability as a source of—		Soil features affecting—	
Local roads and streets	Pond reservoir areas	Embankments, dikes, and levees	Road fill	Topsoil	Irrigation	Terraces and diversions
Slight	Severe: seepage.	Moderate: piping	Good	Poor: too sandy.	Droughty; seepage.	Erodes easily; too sandy.
Moderate: low strength.	Moderate: seepage.	Moderate: piping	Fair: low strength.	Fair: excess lime; slope.	Slope	Slope.

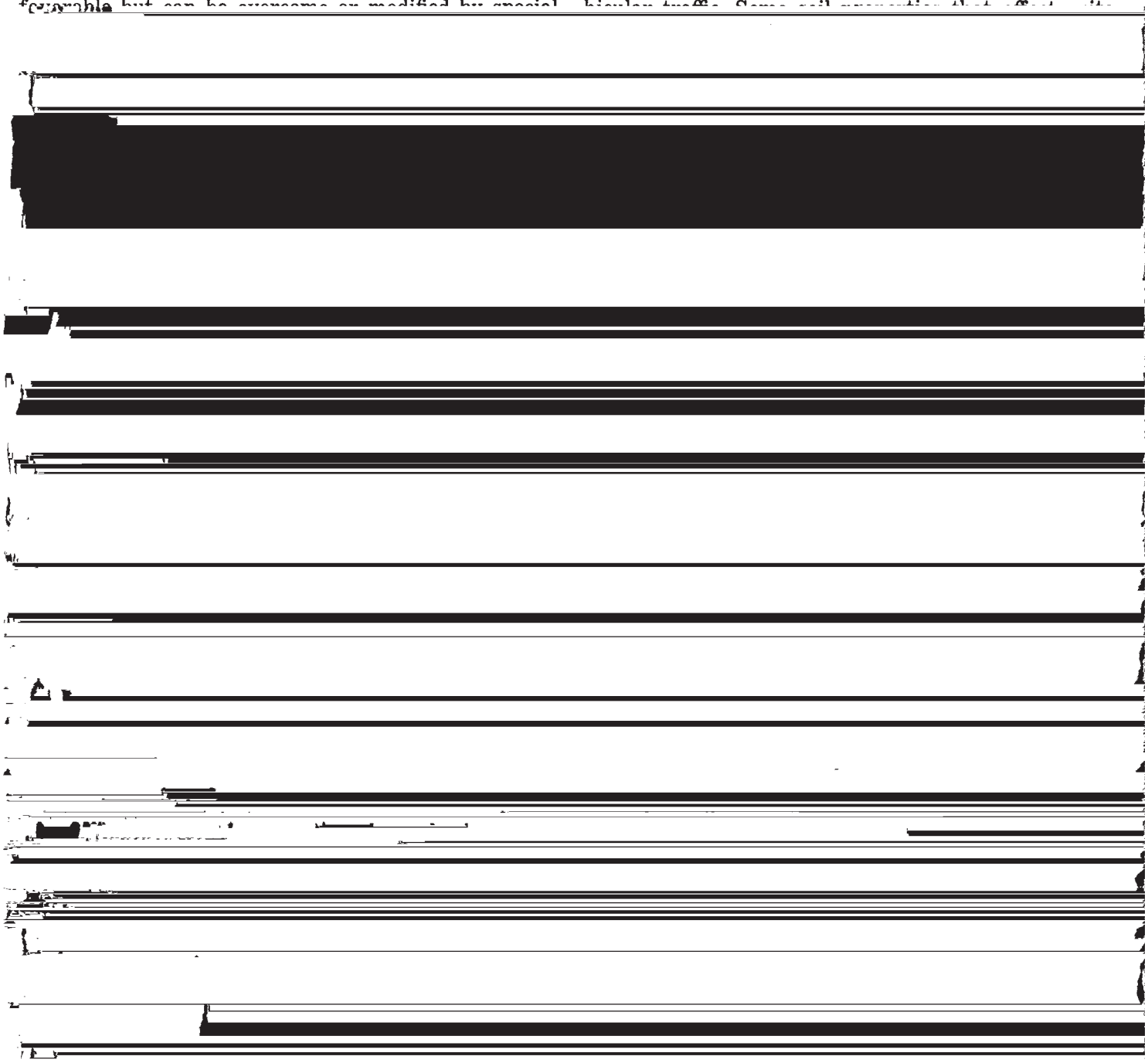
ground water in landfill deeper than 5 or 6 feet.

than for irrigation and terraces and diversions. For these particular uses, table 6 lists those soil features not to be overlooked in planning, installing, and maintaining structures.

Soil limitations are indicated by the ratings slight, moderate and severe. *Slight* means that soil properties are generally favorable for the rated use, or in other words, limitations that are minor and easily overcome. *Moderate* means that some soil properties are unfavorable but can be overcome or modified by special

ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sanitary landfill is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy ve-



soil material and its content of stone fragments affect suitability. Damage to the area from which topsoil ment of soil horizons are briefly described. In addition, the current system of classifying soils is defined and

Short grasses grow on Pullman soils and similar soils that have a high clay content. Tall grasses grow on Springer soils and other sandy soils.

Prairie-type vegetation contributes large amounts of organic matter to the soils of the county. Grass leaves

The top of the Ogallala Formation is the thick layer of caliche rock, or Caprock, that is prominent along the margin of the High Plains (*3*). Potter soils developed in this caliche. Triassic sediments known as Dockum Group are exposed in most

developed. These soils have weak horizon development, but no silicate clay has accumulated in the B horizon.

Amarillo, Olton, and Pullman soils are well developed in Floyd County. These soils have well-expressed

1965 (7). Because this system is under continual study, readers interested in developments of the current system should search the latest literature available.[6]

The current system of classification has six categories. Beginning with the broadest, these categories

ment of water, or both; and those that have thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Haplustolls (*Hapl,* meaning simple horizon, *ust* for dry climate, and *oll* from Mollisol).

SUBGROUP: Each great group is divided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Cumulic Haplustolls.

FAMILY: Soil families are defined within a subgroup primarily on the basis of properties that affect the growth of plants or the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names [illegible] istics and in arrangement in the profile. Bippus series is an example.

General Nature of the County

This section provides information for those not familiar with the county. It describes the climate and its influences and gives a brief history of the settlement of Floyd County.

Climate [7]

Floyd County has a dry steppe climate characterized by mild winters. Average annual precipitation is 18.75 inches. In an average year, 84 percent of the precipitation falls during the warm season, April through October. Monthly and annual amounts of precipitation are extremely variable. In 1941, the wettest year of record, 43.45 inches fell, which was eight times that of 1956, the driest year, when 5.32 inches fell. Warm season rainfall occurs most frequently during thunderstorms. In exceptionally wet years, a significant proportion of the total precipitation results from excessive downpours that run off rapidly and erode the soil. In an average year, thunderstorms occur on 44 days in Floyd County. Facts about temperature and precipitation are given in table 8.

The prevailing wind is southwesterly in November through April and southerly in May through October.

In winter, Floyd County receives approximately 67 percent of the total possible sunshine; in summer, it receives about 78 percent. Average annual free water (lake) evaporation is estimated at 69 inches.

The Polar Canadian airmasses that sweep southward across the Great Plains in winter bring sharp drops in temperature in the Floydada area. Sometimes temper-

year a few wells have to be abandoned. However, irrigation has made Floyd County one of the leading Texas counties in crop income.

In the 1970 census, Floyd County had a population of 11,044, a decline from the 1960 population of 12,369.

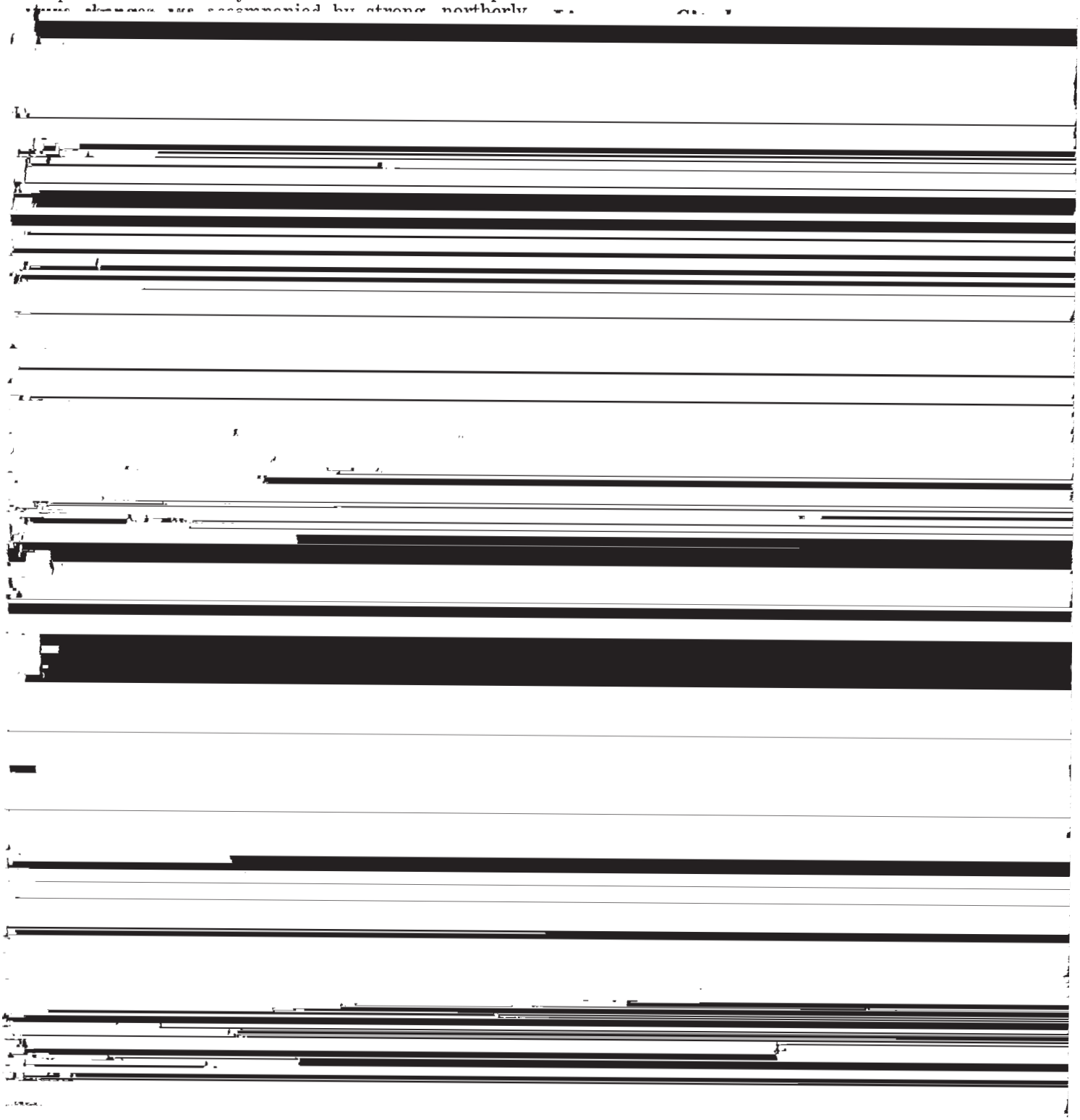


TABLE 8.—*Temperature*

[Data from Floydada; 1953–69;

Month	Temperature [1]				Precipitation			
						Probability of receiving—		
	Average high	Average monthly highest	Average low	Average monthly lowest	Average total [1]	0 or trace	0.50 inch or more	1 inch or more
	°F	°F	°F	°F	In	Pct	Pct	Pct
January	53.4	73.9	23.1	4.0	0.41	4	49	27
February	57.3	77.1	26.5	9.6	0.64	10	50	24
March	65.5	83.8	32.8	14.4	0.77	11	55	30
April	76.2	91.8	44.3	28.7	1.16	([3])	75	52
May	83.3	96.5	53.7	40.3	2.84	([3])	96	90
June	90.1	101.0	62.7	52.6	3.35	([3])	85	75
July	93.2	100.3	66.8	59.6	2.68	([3])	80	69
August	92.3	100.1	64.5	56.5	1.62	3	78	60
September	85.7	95.9	57.6	45.0	1.93	4	76	60
October	73.7	91.0	46.5	32.9	2.13	5	80	80
November	64.0	81.1	34.0	18.7	0.65	18	40	22
December	55.6	74.5	26.8	11.8	0.57	10	50	30
Year	74.2		44.9		18.75			

[1] Average length of record, 17 years.
[2] Average length of record, 14 years.
[3] Less than 1 percent.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Contour farming. Plowing, cultivating, planting, and harvesting in rows that are at right angles to the natural direction of the slope or that are parallel to terrace grade.

Cutbanks cave. Walls of cuts not stable.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Deferred grazing. The practice of delaying grazing until range plants have reached a definite stage of growth, in order to increase the vigor of the forage and to allow the desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Excess lime. Carbonates restrict plant growth.

Fallow. Cropland left idle in order to restore productivity, mainly through accumulation of water, nutrients, or both. Summer fallow is a common stage before cereal grain in regions of limited rainfall. The soil is tilled for at least one growing season to control weeds, to aid decomposition of plant residues, and to encourage the storage of moisture for the succeeding grain crop.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical con-

Precipitation—Continued										
Probability of receiving—Continued					Average number of days with precipitation of—[2]			Snow and sleet		
2 inches or more	3 inches or more	4 inches or more	5 inches or more	6 inches or more	0.10 inch or more	0.50 inch or more	1 inch or more	Average total [1]	Maximum monthly [1]	Greatest depth [2]
Pct	*Pct*	*Pct*	*Pct*	*Pct*				*In*	*In*	*In*
7	2	([3])	([3])	([3])	1	([4])	0	1.5	7.0	---
5	2	([3])	([3])	([3])	2	([4])	0	3.3	13.0	12
9	3	2	([3])	([3])	2	1	0	1.8	11.0	6
23	10	5	2	([3])	2	1	([4])	([5])	([5])	([5])
70	50	34	23	15	5	1	([4])	([5])	([5])	0
54	35	22	13	10	5	3	1	0	0	0
41	20	10	5	1	4	2	1	0	0	0
39	20	10	5	5	3	1	1	0	0	0
36	23	14	10	6	4	2	1	0	0	0
39	24	14	8	4	3	1	1	0	0	0
8	3	1	([3])	([3])	2	([4])	([4])	0.4	4.0	3
10	4	2	([3])	([3])	2	([4])	([4])	1.1	10.5	10
					35	12	5	8.1	13.0	12

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

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

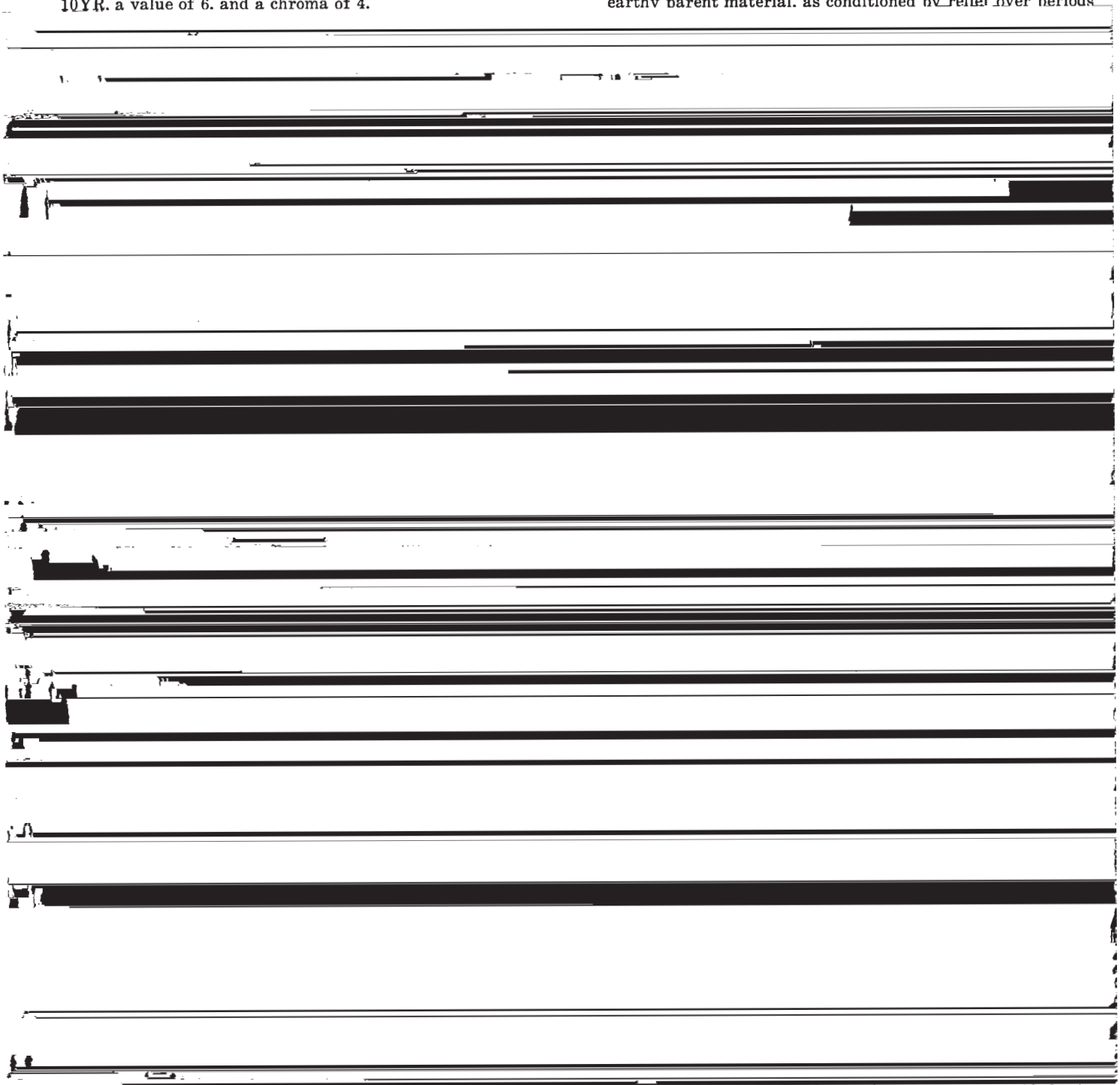
Gilgai. Typically, the microrelief of Vertisols—clayey soils that have a high coefficient of expansion and contraction with

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Humus. The well-decomposed, more or less stable part of the organic matter in mineral soils.

example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief, over periods



Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Percs slowly. Water moves through the soil too slowly.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

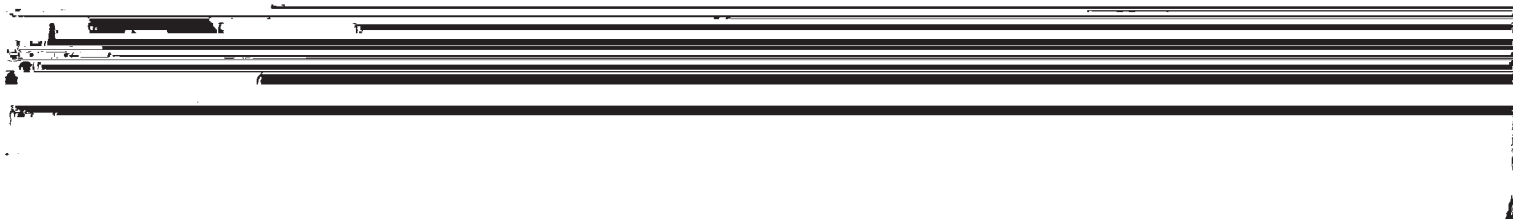
Phase, soil. A subdivision of a soil, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil type, for

equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeters); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. In referring to a capability unit, a range site, wildlife rating, or recreational development, read the introduction to the section it is in for general information about its management. Dashes in a column mean that the mapping unit was not placed in that particular grouping.

Map symbol	Mapping unit	Page	Capability unit		Range site	
			Dryland	Irrigated	Name	Page
AfA	Amarillo fine sandy loam, 0 to 1 percent slopes	6	IIIe-3	IIe-2	Sandy Loam	42
AfB	Amarillo fine sandy loam, 1 to 3 percent slopes	7	IIIe-3	IIIe-3	Sandy Loam	42
AfC	Amarillo fine sandy loam, 3 to 5 percent slopes	7	IVe-2	IVe-1	Sandy Loam	42
BeB	Berda loam, 1 to 3 percent slopes	8	IIIe-2	IIIe-2	Hardland Slopes	41
BeC	Berda loam, 3 to 5 percent slopes	8	IVe-3	IVe-2	Hardland Slopes	41
BeD	Berda loam, 5 to 12 percent slopes	9	VIe-2	------	Hardland Slopes	41
BoE	Berda and Paloduro soils, 5 to 20 percent slopes	9	VIe-2	------	Hardland Slopes	41
BPG	Berda and Potter soils, steep	9	VIIe-1	------	Rough Breaks	42
BtA	Bippus clay loam, 0 to 1 percent slopes	11	IIe-1	IIe-1	Valley	43
Bw	Bippus clay loam, frequently flooded	11	Vw-1	------	Valley	43
DrB	Drake soils, 1 to 3 percent slopes	12	IVe-5	IIIe-5	High Lime	41
DrC	Drake soils, 3 to 5 percent slopes	12	VIe-3	IIIe-5	High Lime	41
EsA	Estacado clay loam, 0 to 1 percent slopes	13	IIIe-5	IIe-1	Hardland Slopes	41
EsB	Estacado clay loam, 1 to 3 percent slopes	13	IIIe-2	IIIe-2	Hardland Slopes	41
FoB	Flomot fine sandy loam, 1 to 3 percent slopes	14	IVe-1	IIIe-4	Mixedland Slopes	41
FoC	Flomot fine sandy loam, 3 to 5 percent slopes	15	IVe-3	IVe-2	Mixedland Slopes	41
FoD	Flomot fine sandy loam, 5 to 12 percent slopes	15	VIe-2	------	Mixedland Slopes	41
LaE	Latom soils and Rock outcrop, 5 to 20 percent slopes	15	VIIs-1	------	Very Shallow	43
LkD	Likes loamy fine sand, 3 to 8 percent slopes	17	VIe-1	------	Sandy	42
Ln	Lincoln soils, frequently flooded	17	Vw-2	------	Sandy Bottomland	42
Lo	Lofton clay loam	19	IIIe-4	IIs-1	Clay Loam	40
MaB	Mansker clay loam, 1 to 3 percent slopes	20	IVe-1	IIIe-4	Hardland Slopes	41
MaC	Mansker clay loam, 3 to 5 percent slopes	20	IVe-3	IVe-2	Hardland Slopes	41
MoB	Mobeetie fine sandy loam, 0 to 3 percent slopes	21	IVe-4	IIIe-3	Mixedland Slopes	41
ObD	Obaro and Quinlan soils, 5 to 12 percent slopes	21	VIe-3	------	Mixedland	41
OtA	Olton clay loam, 0 to 1 percent slopes	23	IIIe-5	IIe-1	Clay Loam	40
OtB	Olton clay loam, 1 to 3 percent slopes	23	IIIe-2	IIIe-2	Clay Loam	40
PaA	Paloduro loam, 0 to 1 percent slopes	24	IIIe-3	IIe-2	Hardland Slopes	41
PdG	Polar and Paloduro soils, 3 to 30 percent slopes	25	VIs-1	------	Gravelly	40
PmA	Portales loam, 0 to 1 percent slopes	26	IIIe-5	IIe-2	Hardland Slopes	41
PsD	Posey and Tulia soils, 5 to 12 percent slopes	27	VIe-2	------	Hardland Slopes	41
PtE	Potter soils, 2 to 20 percent slopes	28	VIIs-1	------	Very Shallow	43



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