United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with the
Missouri Agricultural
Experiment Station

Soil Survey of Stoddard County, Missouri

How To Use This Soil Survey

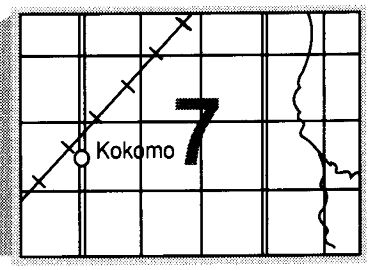
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

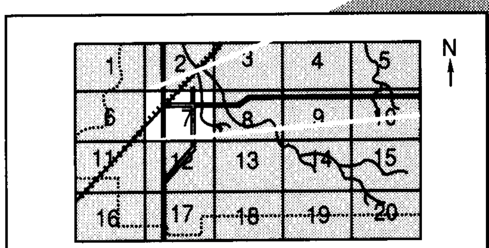
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



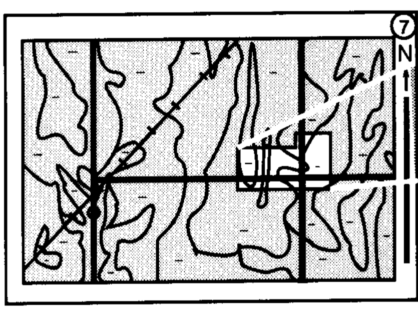
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

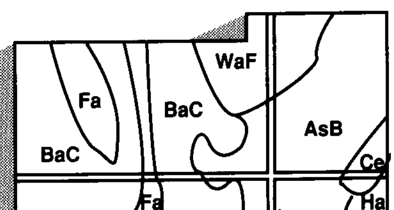


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. 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, regardless of race, color, national origin, sex, religion, marital status, or age.

This survey was made cooperatively by the Soil Conservation Service and the Missouri Agricultural Experiment Station. It is part of the technical assistance furnished to the Stoddard County Soil and Water Conservation District. The Missouri Department of Natural Resources provided a soil scientist to assist with the fieldwork. The County Court provided funds through the Conservation District to provide a soil scientist to assist with the fieldwork. The Bootheel Resource Conservation and Development Program, through the Comprehensive Employment and Training Act (CETA program), also provided personnel to assist with the fieldwork. Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1982. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Harvesting soybeans on Malden loamy sand.

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Soil Series

Issued December 1985

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Foreword

This soil survey contains information that can be used in land-planning programs in Stoddard County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

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Soil Survey of Stoddard County, Missouri

By E. Rex Butler, Soil Conservation Service

Fieldwork by E. Rex Butler, Soil Conservation Service, and
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United States Department of Agriculture, Soil Conservation Service,
in cooperation with the Missouri Agricultural Experiment Station

Stoddard County is in the southeastern part of Missouri known as the "Bootheel" because of its outline on the map (fig. 1). The county extends 34 3/4 miles from north to south and 32 miles at its widest part from east to west. It has a total area of 530,496 acres, or approximately 837 square miles, and is the eighth largest county in Missouri.

Stoddard County is part of the Southern Mississippi Valley Alluvium and Southern Mississippi Valley Silty Uplands Resource Areas. About 25 percent of the county is in the uplands of Crowley's Ridge; the remainder is in the former Western Lowlands and Morehouse Lowlands of the Mississippi River Delta. The uplands has a gently undulating to very steep topography mantled with windblown material, or loess. Except for Crowley's Ridge, the county is relatively flat with only gradual changes in elevation. There are some short, steep slopes where the elevation varies up to about 15 feet. The former delta has old channels, bayous, and natural levees formed by streams that are no longer in the flood plain. Elevation ranges from about 570 feet on Crowley's Ridge to 280 feet along the southern boundary of the county.

The St. Francis River is the western boundary of Stoddard County. The St. Francis River and its tributaries drain the area west of the eastern edge of Crowley's Ridge. All major streams in the county flow westerly or southwesterly except the Castor River, which flows in a southeasterly direction.

The eastern boundary of the county is formed in part by the Little River and the Whitewater River. Many drainage districts have been organized to drain what was once extensive swampland (fig. 2).

Agriculture is the main enterprise, and cash crops are the major source of farm income. Soybeans, corn, cotton, wheat, grain sorghum, rice, and specialty crops of cabbage, melons, and sweet corn are some of the crops grown.

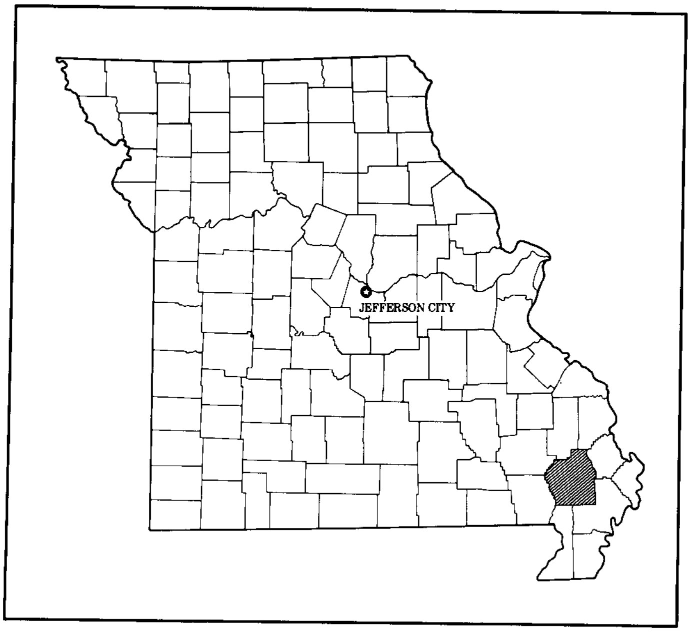

Figure 1.—Location of Stoddard County in Missouri.

A soil survey of Stoddard County was previously published in 1914 (*25*). This survey updates that earlier survey. It defines the soil boundaries in much more detail and provides additional information, which was not available when the mapping of the county was done at the turn of the century.

Descriptions, names, and delineations of most of the soils in this survey agree with recent surveys of adjoining counties. The map scale and detail shown in this survey, however, are not the same as the scale and detail of some of the minor map units shown in surveys of adjoining counties.

General Nature of the County

This section gives general information about the history and settlement; natural resources; physiography, relief, and drainage; and climate.

History and Settlement

The first permanent settlement was made in 1823 by migrants from North Carolina, who located about 3 miles east of the present town of Bloomfield. In 1829, part of the area that is now Stoddard County was annexed by Cape Girardeau County and divided into two civil townships. This arrangement continued until 1835, when Stoddard County was formed from parts of the adjoining counties of Cape Girardeau, New Madrid, and Wayne. The county was named for Captain Amos Stoddard, the first governor of Louisiana Territory (*9*).

At the time of its original delineation, the county included part of present Dunklin County. The present boundaries were not established until 1853. Bloomfield, the county seat, is on high ground (elevation 500 feet) near the center of the county. It was so named because the original 50-acre tract, donated by Absolom B. Bailey, was a flower-covered field at the time. Before it was

Figure 2.—Many areas of swampland such as this have been cleared and drained.

destroyed during the Civil War, Bloomfield was a very prosperous community and was second in size only to Cape Girardeau in southeast Missouri. Bloomfield was later rebuilt and now has approximately 1,400 people.

The largest town in the county is Dexter, which was established in 1873 and now extends to within about 5 miles of Bloomfield. Dexter is a thriving community of about 6,000. Its economy is based mainly on the farm trade, and it also has manufacturing and industrial concerns.

Bernie, Advance, Essex, and Puxico are trading points and each has 500 to 1,100 inhabitants. Other communities in the county range down to crossroads-store-size settlements.

Natural Resources

The soils and the crops they produce are the most important natural resources of Stoddard County. Many products are directly or indirectly derived from the soils: cultivated crops, orchard crops, forages, livestock, honey, and wild plants and animals are all valuable products of the soil. Soil is also used for fill, topsoil, waste disposal, and other construction uses.

Another important natural resource of the county is its abundant supply of both surface and ground water. Numerous ponds and small lakes are useful for livestock watering, erosion control, storm-water retention, and recreation. Lakes on Duck Creek and Otter Slough State Wildlife Management Areas are major fishing and waterfowl hunting reservoirs. Otter Slough also has one of the few remaining stands of native cypress and tupelo gum trees in southeastern Missouri. Rockhouse Cypress Lake on Mingo National Wildlife Refuge is a resting and breeding area for migratory waterfowl and other aquatic life.

Ground water is plentiful for agriculture, domestic, industrial, and municipal uses. It is provided by three major aquifers (water-bearing units): (1) the alluvial aquifer, (2) the Wilcox Group, and (3) the McNairy (Ripley) Formation (*15*).

The alluvial aquifer underlies most of the bottom land east and west of Crowley's Ridge. Water from this aquifer is clear, has a constant low temperature, and can be used without treatment for some purposes. The most important potential uses are for irrigation and heat exchange. With treatment, this water is suitable for public consumption and industrial uses (*3*).

Water from the alluvial aquifer is of high quality for irrigation, and it is intensively used. The reaction of this water is nearly neutral, and it has a low content of sodium and other potentially harmful salts. Irrigation wells are usually 60 to 100 feet deep and yield about 1,000 gallons per minute; however, yields of as much as 3,000 to 5,000 gallons per minute are sometimes obtained from properly constructed wells (*13, 22*). This aquifer is replenished each year from precipitation and by other aquifers.

The Wilcox aquifer is used primarily for domestic water supplies in the upland part of the county between Bernie and Aquilla. In a few places it is also used for irrigation and fish farming. Most wells are about 40 to 170 feet deep.

The McNairy Formation supplies much of the water for municipalities and public water districts. Depth of the wells ranges from about 100 to 700 feet. Most of these wells yield water that is relatively soft and low in iron content. Because of this high quality, the McNairy is a potential source for many industrial uses (*11*).

Sand, gravel, and clay are also valuable natural resources. Sand has been mined from the Wilcox and McNairy Formations and used for asphalt blending sand and for fill. Gravel is mined from the Lafayette Gravel that underlies many of the higher hills. In an unprocessed state this gravel, locally called "red gravel," is used for roads, parking lots, driveways, base material, and fill. With processing, the gravel is used for base aggregate, concrete sand and gravel, aggregate for asphalt roads, and several other uses. Clay is mined from the Porter's Creek Clay Formation northeast of Bloomfield and made into an absorbent.

Physiography, Relief, and Drainage

Stoddard County is in several physiographic regions. The two major ones are the Mississippi River Alluvial Valley along the east and west sides of the county and the Crowley's Ridge Upland in the central part of the county.

The alluvial valley west of Crowley's Ridge was formed mainly by the ancestral Mississippi River during the Pleistocene glaciation. This lowland has large belts of silty soils on several different terrace levels. It is mostly nearly level and drains in a southerly direction.

The alluvial valley east of Crowley's Ridge was formed by the Ohio River during the Pleistocene glaciation and by the Mississippi River during the late glacial and postglacial periods. These ancestral streams flowed in multiple, shallow braided channels and developed a complex pattern of natural levees, low flats, channels, and low basins. The soils on this lowland range from sandy to clayey. Surface water drains in a southerly direction.

The Crowley's Ridge Upland, which covers about 25 percent of the county, is largely a remnant of the Gulf Coastal Plain. The extreme western and northern parts of the ridge have outcrops of Ordovician rocks similar to those of the adjacent Ozark Mountains. The hills of this upland range from gently sloping to steep and are mostly covered by silty loessal soils. The majority of the streams drain in a westerly direction.

Surface elevation ranges from about 280 feet above sea level in the southeast corner of the county to about 586 feet on Crowley's Ridge southwest of Bell City.

In the past, the Castor, Mississippi, St. Francis, and Whitewater Rivers flooded much of the lowlands. A diversion channel in Bollinger and Cape Girardeau Counties to the north now diverts the Castor and Whitewater Rivers into the Mississippi River near Cape Girardeau. The Wappapello Dam and channelization has eliminated most of the flooding along the St. Francis River. Leveeing of the Mississippi River, channelization of the Castor River, and an extensive ditch system now protect most of the lowlands east of Crowley's Ridge from most high water.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Stoddard County has long hot summers and rather cool winters. An occasional cold wave brings near-freezing or sub-freezing temperatures but seldom much snow. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation falls mainly in afternoon thunderstorms and is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Dexter in the period 1961 to 1979. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 37 degrees F, and the average daily minimum temperature is 28 degrees. The lowest temperature on record, which occurred on January 11, 1977, is minus 10 degrees. In summer the average temperature is 78 degrees, and the average daily maximum temperature is 90 degrees. The highest recorded temperature, which occurred on August 4, 1968, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 48 inches. Of this, about 25 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 5.86 inches on January 30, 1969. Thunderstorms occur on about 55 days each year, and most occur in summer.

The average seasonal snowfall is 11 inches. The greatest snow depth at any one time during the period of record was 15 inches. On an average, 9 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12 miles per hour, in March.

Severe local storms, including tornadoes, may strike occasionally. These are usually of short duration, and damage is variable and spotty.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each soil association on the general soil map is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one associations can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Descriptions, names, and delineations of soils in this survey do not fully agree with previously published surveys of adjacent counties. Differences are the result of additional soil data, different intensities of mapping, and correlation decisions that reflect local variations. In mapping some places it is more feasible to combine small acreages of similar soils that respond to use and management in much the same way than it is to separate these soils and give them different names.

Soil Descriptions

Nearly level to strongly sloping, poorly drained to well drained soils on natural levees and terraces

These soils formed on a geomorphic landform and reflect the influences of braided stream drainage. They are used extensively for row crops and small grains with much double cropping of wheat followed by grain sorghum or soybeans. Furrow and sprinkler irrigation are common. Wetness, erosion, and maintenance of organic matter and tilth are the major management concerns.

1. Calhoun-Dubbs association

Nearly level and gently sloping, poorly drained and well drained silty soils; on terraces and natural levees

This association consists of some of the highest terraces of the county. The surface of these terraces ranges from about 10 to 35 feet higher than the adjoining lower terraces or flood plains (fig. 3). The nearly level areas are in the center of the terraces, and the gently sloping areas are around drainageways and along the edges of the terraces. Other gently sloping areas occur as oblong ridges adjacent to drainageways.

This association makes up about 2 percent of the county. It is about 74 percent Calhoun soils, 16 percent Dubbs soils, and 10 percent minor soils.

The Calhoun soils are poorly drained and nearly level. They are on drainageways 2 to 10 feet lower than the Dubbs soils. In other places they are on the tops of the terraces a few feet higher than the Dubbs soils. Calhoun soils have a brown, silt loam surface layer; a light gray, mottled, silt loam subsurface layer; and a light brownish gray, silty clay loam subsoil.

The Dubbs soils are well drained and gently sloping. They are either a few feet higher or a few feet lower in elevation than the Calhoun soils. Dubbs soils have a brown, silt loam surface layer and subsurface layer and a dark brown, silt loam and silty clay loam subsoil.

Of minor extent are Askew, Crowley, and Dundee soils. The Askew soils are moderately well drained and are on gentle, convex side slopes. The Crowley soils are somewhat poorly drained, have a clayey subsoil, and are a few inches lower than the Calhoun soils. The Dundee soils are somewhat poorly drained, are on nearly level areas, and are a few inches to a few feet lower than the Calhoun soils.

Nearly all of this association is used for cultivated crops such as corn, grain sorghum, soybeans, rice, and wheat. A small acreage is used for woodland and urban and built-up areas.

These soils are well suited to cultivated crops. Wetness, erosion, and maintenance of organic matter and soil tilth are main concerns in management. Controlling erosion is a major concern on the gently sloping areas.

The Calhoun soils are generally unsuited to building site development and sanitary facilities because of wetness. The Dubbs soils are well suited to these uses.

2. Amagon-Bosket-Dubbs association

Nearly level to strongly sloping, poorly drained and well drained, silty and loamy soils; on low terraces and natural levees

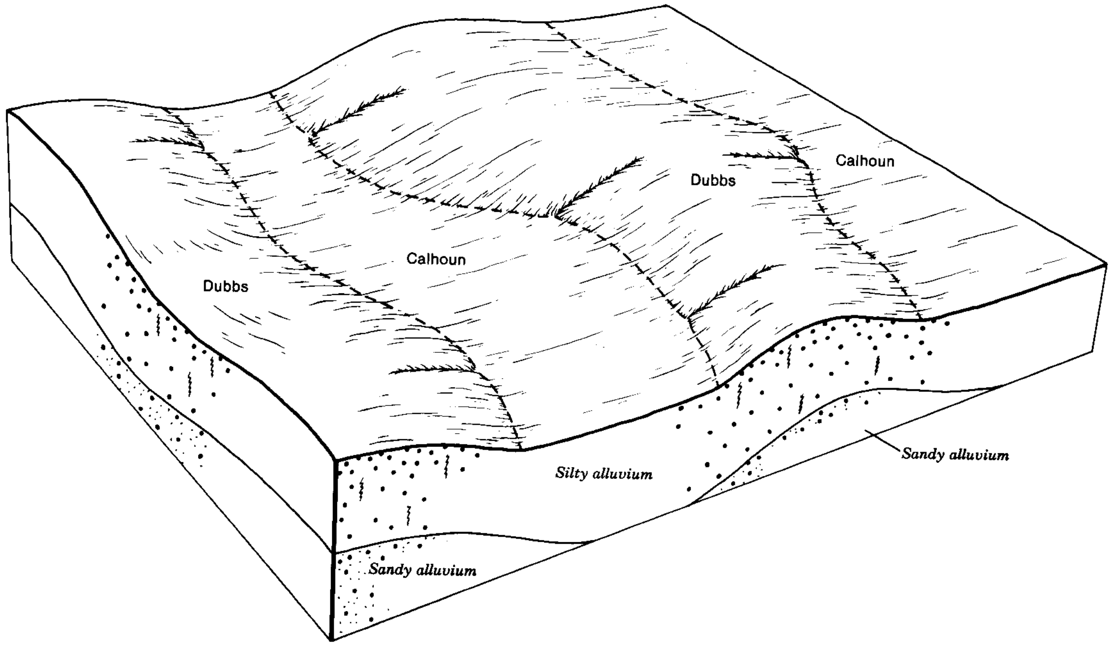

Figure 3.—Pattern of soils and underlying material in the Calhoun-Dubbs association.

This association consists of low terraces bordered by higher natural levees (fig. 4). The drainageways of the terraces have a northeast to southwest trend and are subject to seasonal flooding. The higher natural levees are mostly oblong ridges with a similar northeast and southwest trend.

This association makes up about 3.5 percent of the county. It is about 39 percent Amagon soils, 31 percent Bosket soils, 8 percent Dubbs soils, and 22 percent minor soils.

The Amagon soils are poorly drained and nearly level. They are typically 3 to 15 feet lower in elevation than the Bosket and Dubbs soils. Amagon soils have a dark grayish brown, silt loam surface layer. The subsoil is light brownish gray, mottled and grayish brown silty clay loam in the upper part and light gray silt loam in the lower part.

The Bosket soils are well drained and gently sloping to strongly sloping. They are a few inches to 2 feet higher in elevation than the Dubbs soils and 3 to 15 feet higher than the Amagon soils. Bosket soils have a dark brown and brown, fine sandy loam surface layer and subsurface layer and a brown, sandy clay loam and fine sandy loam subsoil. The substratum is brown, mottled fine sandy loam.

The Dubbs soils are well drained and gently sloping. They commonly are a few inches to 2 feet lower in elevation than the Bosket soils. They are about 3 to 10 feet higher in elevation than the Amagon soils. Dubbs soils have a brown, silt loam surface layer and subsurface layer and a brown, silt loam and silty clay loam subsoil.

Of minor extent are somewhat poorly drained Falaya soils in drainageways and darker Sikeston and Wardell soils in drainageways.

Most of this association is used for cultivated crops such as corn, grain sorghum, soybeans, and wheat. A minor acreage is used for urban and built-up areas.

These soils are well suited to cultivated crops. Wetness, erosion, and maintenance of organic matter are main concerns in management. Control of erosion is a major concern on the gently sloping and moderately sloping parts of natural levees.

This association is moderately well suited to building site development and sanitary facilities except in the lower areas of Amagon soils. Wetness and seasonal flooding on the lower areas are major concerns in construction. Seepage is a limitation for lagoons on Bosket and Dubbs soils.

3. Lilbourn-Farrenburg-Canalou association

Nearly level, somewhat poorly drained and moderately well drained, loamy and sandy soils; on terraces and natural levees

The typical landscape of this association is a complex pattern of sinuous, braided stream channels, natural levees, and flats (fig. 5). The natural levees generally are a few inches to a few feet higher than the channels and flats and are usually oriented in a north-south direction. Half or more of this association has been graded to form a flat, uniform surface.

This association makes up about 13 percent of the county. It is about 44 percent Lilbourn soils, 16 percent Farrenburg soils, 12 percent Canalou soils, and 28 percent minor soils.

The Lilbourn soils are somewhat poorly drained. They are a few inches to a few feet lower in elevation than the Farrenburg and Canalou soils. Lilbourn soils have a brown, fine sandy loam surface layer and a brown, fine sandy loam subsurface layer. The substratum is light brownish gray, mottled fine sandy loam underlain by a buried subsoil layer of light brownish gray, mottled loam. Below this the substratum is light brownish gray, mottled loam and grayish brown, mottled sandy loam.

The Farrenburg soils are moderately well drained. They are at higher elevations than the Lilbourn soils and at the same elevations as the Canalou soils. Farrenburg soils have a dark brown and brown, fine sandy loam surface layer and a yellowish brown, fine sandy loam subsurface layer. The subsoil is dark yellowish brown, mottled, firm loam. The substratum is dark brown loamy sand.

The Canalou soils are moderately well drained. They are higher in elevation than the Lilbourn soils and about the same in elevation as the Farrenburg soils. Canalou soils have a dark brown and very dark brown, loamy sand surface layer. The subsoil is dark brown, mottled loamy sand; strong brown, mottled sandy loam; and dark yellowish brown, mottled loamy sand. The substratum is yellowish brown, mottled coarse sand.

Of minor extent are somewhat poorly drained Dundee soils and poorly drained Gideon, Roellen, Sharkey, Sikeston, and Tuckerman soils. The Dundee soils are more clayey in the subsoil than Lilbourn soils and are on low flats and swales. The Gideon soils are on low drainageways and natural levees. The Roellen and Sharkey soils have clayey subsoils and are on the lowest channel positions. The Sikeston soils are in concave basins and old channels, and they have thick dark layers to a depth of about 27 inches. The Tuckerman soils are on low flats and in basins and old channels.

Nearly all of this association is used for cultivated crops, mainly corn, cotton, grain sorghum, soybeans, and wheat. A very small acreage is used for building sites.

These soils are well suited for cultivated crops. Wetness and seasonal flooding are major concerns of management in the lower areas. Wind erosion and seasonal droughtiness are the main concerns on the higher, sandy natural levees.

This association generally is unsuited to building site development and sanitary facilities. Wetness and flooding are the main concerns in construction.

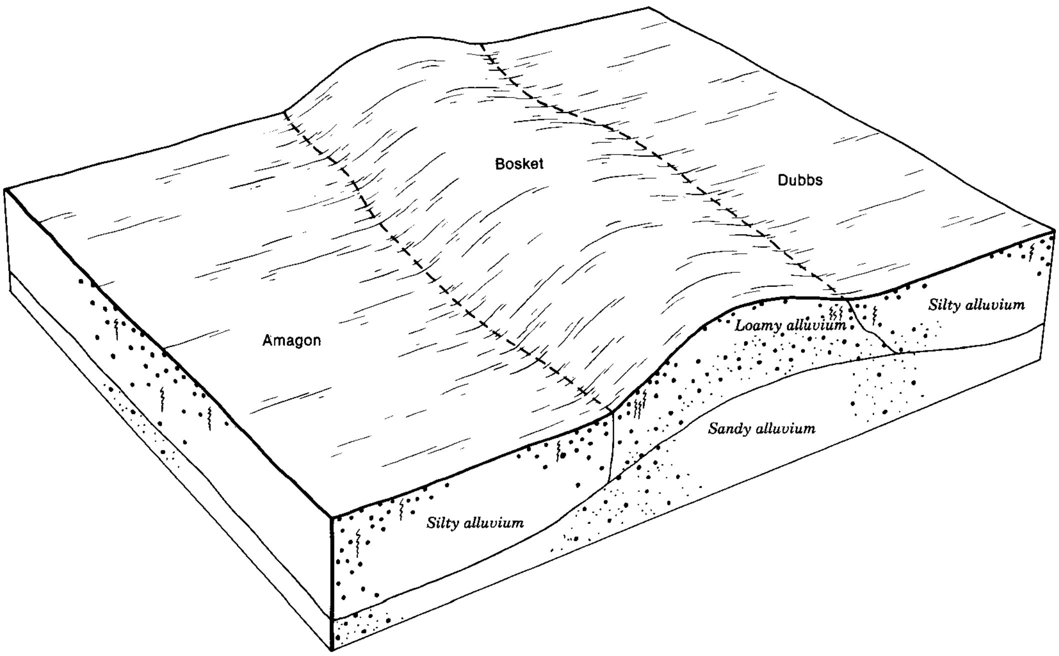

Figure 4.—Pattern of soils and underlying material in the Amagon-Bosket-Dubbs association.

Nearly level, poorly drained and somewhat poorly drained soils, on flood plains, terraces, and natural levees

These soils formed on a geomorphic landform and reflect a featureless plain. Most areas are graded and furrow irrigated. These soils are used mostly for rice, corn, soybeans, grain sorghum, cotton, and winter wheat. Corn is seldom grown on the clayey soils. Double cropping following wheat is common. Wetness, flooding, and tilth are the major management concerns.

4. Sharkey-Gideon association

Nearly level, poorly drained, silty, loamy, and clayey soils; on flood plains and low natural levees

This association consists of broad basins and former braided stream channels interspersed with low natural levees (fig. 6). Much of the surface now appears to be a flat, featureless plain.

This association makes up about 17 percent of the county. It is about 53 percent Sharkey soils, 29 percent Gideon soils, and 18 percent minor soils.

The Sharkey soils commonly are a few inches lower in elevation than the Gideon soils. They have a dark grayish brown, silty clay loam or silty clay surface layer and a gray, mottled clay subsoil. The substratum is gray, mottled clay.

The Gideon soils are on low natural levees only a few inches higher than the Sharkey soils. They have a very dark grayish brown, loam surface layer and a gray and light gray, mottled, sandy clay loam and clay loam subsoil.

Of minor extent are the more silty Mhoon soils on low natural levees and the more loamy Tuckerman soils with strongly acid to very strongly acid subsoils. The Tuckerman soils are also on low natural levees.

Nearly all of this association is used for growing cotton, grain sorghum, rice, soybeans, and wheat. A very small acreage is used for woodland, fish farms, and building sites.

This association is suited to cultivated crops and aquaculture. Seasonal flooding in the lower areas and wetness are the main concerns in management.

These soils generally are unsuited to building site development and sanitary facilities. A high shrink-swell potential, wetness, and seasonal flooding are major concerns in construction.

5. Commerce-Roellen-Mhoon association

Nearly level, somewhat poorly drained and poorly drained, silty soils; on flood plains and low natural levees

This association consists of old river basins and channels with adjacent low flats and natural levees (fig. 7). The basins, formerly much larger in extent, have been partially filled by younger silty soils. The soils in the basins typically have a very dark surface; the soils in the

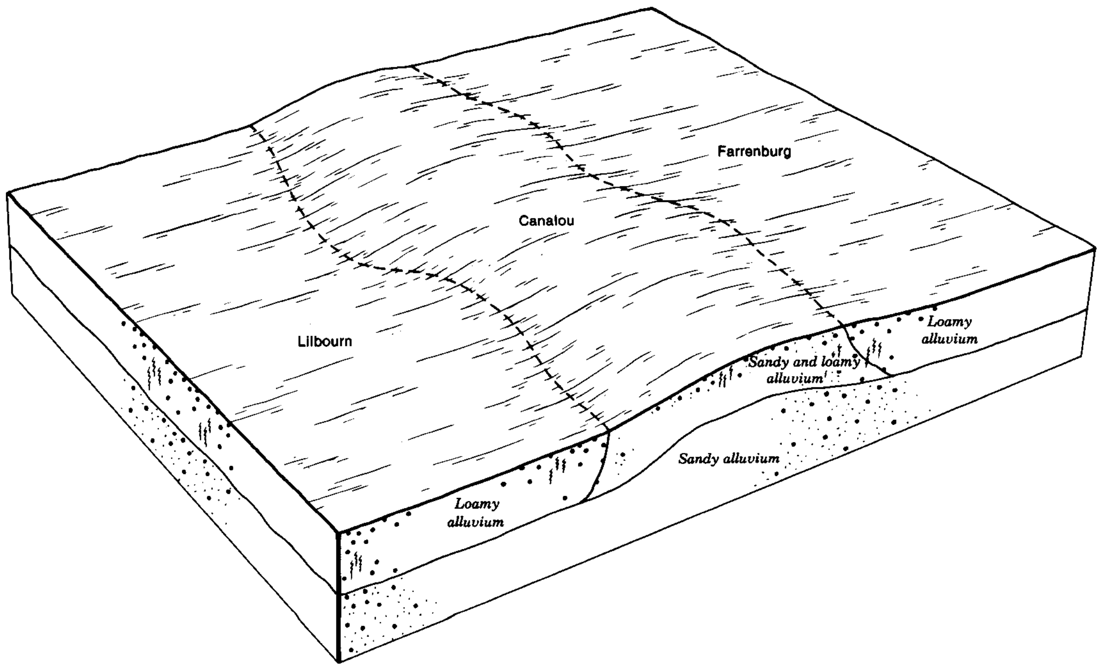

Figure 5.—Pattern of soils and underlying material in the Lilbourn-Farrenburg-Canalou association.

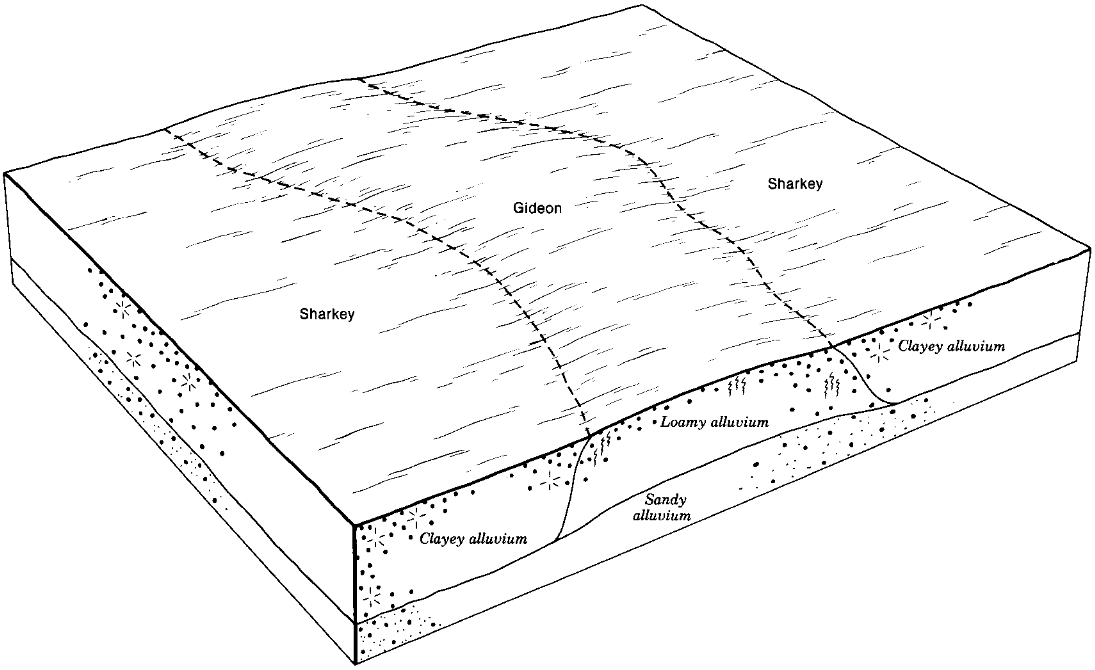

Figure 6.—Pattern of soils and underlying material in the Sharkey-Gideon association.

low flats and natural levees have a noticeably lighter colored surface.

This association makes up about 7 percent of the county. It is about 36 percent Commerce soils, 31 percent Roellen soils, 26 percent Mhoon soils, and 7 percent minor soils.

The Commerce soils are somewhat poorly drained. They are on low natural levees and flood plains only a few inches higher than the Roellen and Mhoon soils. Commerce soils have a brown, silt loam surface layer. The upper part of the substratum is dark grayish brown and grayish brown, mottled silt loam. Below this is a buried subsoil of dark grayish brown, mottled silty clay loam and dark gray, mottled silty clay. Below this the substratum is gray, mottled silty clay.

The Roellen soils are poorly drained. They are a few inches lower in elevation than the Mhoon and Commerce soils. Roellen soils have a black, silty clay loam surface layer and a dark gray and light olive gray, mottled, silty clay and clay subsoil. The substratum is greenish gray, mottled clay loam and silty clay loam.

The Mhoon soils are poorly drained. They are a few inches higher in elevation than the Roellen soils and a few inches lower than the Commerce soils. Mhoon soils have a dark grayish brown and dark brown, silt loam surface layer and a light gray, mottled, silt loam and silty clay loam subsoil. The substratum is light gray, mottled silt loam and light gray and light brownish gray, mottled silty clay loam.

Of minor extent are Allemands and Canalou soils. The Allemands soils are in low depressions and have organic layers 16 or more inches thick. The Canalou soils are moderately well drained and sandy and are on convex natural levees.

The soils of this association are used for corn, grain sorghum, soybeans, and wheat. A small acreage is used for urban and built-up areas, pasture, and hayland.

These soils are well suited to most cultivated crops grown in the county. Wetness and seasonal flooding are the main concerns in management.

This association generally is unsuited to building site development and sanitary facilities. Wetness, a high shrink-swell potential, and flooding are the main concerns.

6. Crowley-Calhoun-Foley association

Nearly level, somewhat poorly drained and poorly drained, silty soils; on terraces

This association consists of old alluvial or loessal terraces with scattered low ridges (fig. 8). The soils on the terraces have a uniform, silty surface layer and appear to be flat and featureless where they have been graded. The ridges are two-to-five feet high and are concentrated along the edges of the terraces. Soils on the ridges have a noticeably browner surface.

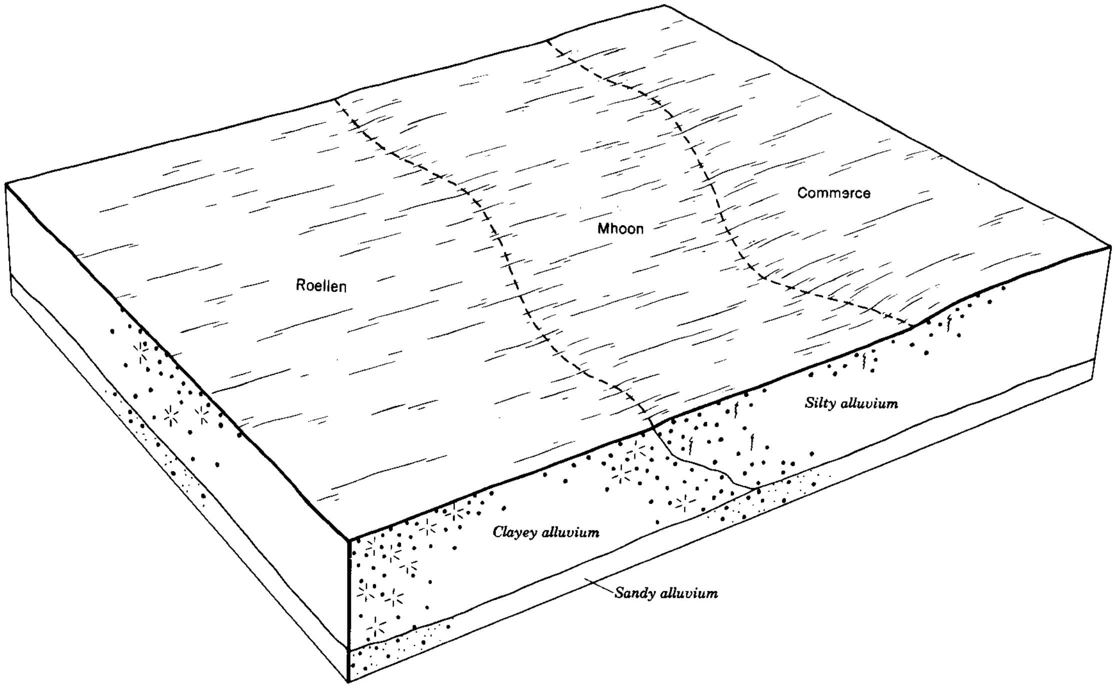

Figure 7.—Pattern of soils and underlying material in the Commerce-Roellen-Mhoon association.

This association makes up about 1 percent of the county. It is about 39 percent Crowley soils, 35 percent Calhoun soils, 13 percent Foley soils, and 13 percent minor soils.

The Crowley soils are somewhat poorly drained. They are usually lower in elevation than the Calhoun and Foley soils. Crowley soils have a dark grayish brown, silt loam surface layer and a light gray, silt loam subsurface layer. The subsoil is grayish brown and light brownish gray, mottled, firm silty clay.

The Calhoun soils are poorly drained. They are slightly higher in elevation than the Crowley soils and at the same, or slightly lower, elevations as the Foley soils. Calhoun soils have a brown, silt loam surface layer; a light gray, silt loam subsurface layer; and a light brownish gray, mottled silty clay loam subsoil.

The Foley soils are poorly drained. They are commonly higher in elevation than the Crowley and Calhoun soils. Foley soils have a dark grayish brown, silt loam surface layer and a grayish brown, silt loam subsurface layer. The subsoil is grayish brown silt loam and gray, mottled silty clay loam in the upper part and light olive gray, gray, and yellowish brown, mottled silt loam in the lower part.

Of minor extent are well drained Dubbs soils on convex natural levees along the edges of the terraces and Dundee soils on concave sides of low terraces. The Dundee soils have thinner, browner subsurface horizons than do the Calhoun and Foley soils and less clay than the Crowley soils.

The soils of this association are used mainly for growing soybeans, grain sorghum, rice, and wheat. A small acreage is used for woodland and building sites.

These soils are well suited to cultivated crops. Their slow to very slow permeability makes them particularly well suited to rice and aquaculture. Wetness and maintenance of organic matter and soil tilth are the main concerns in management.

This association generally is unsuited to building site development and sanitary facilities. Wetness is the major concern in construction.

7. Falaya-Zachary association

Nearly level, somewhat poorly drained and poorly drained, silty soils; on flood plains

This association consists of flood plains that merge into low terraces (fig. 9). In some places are narrow, abandoned stream channels.

This association makes up about 10 percent of the county. It is about 75 percent Falaya and similar soils, 21 percent Zachary soils, and 4 percent minor soils.

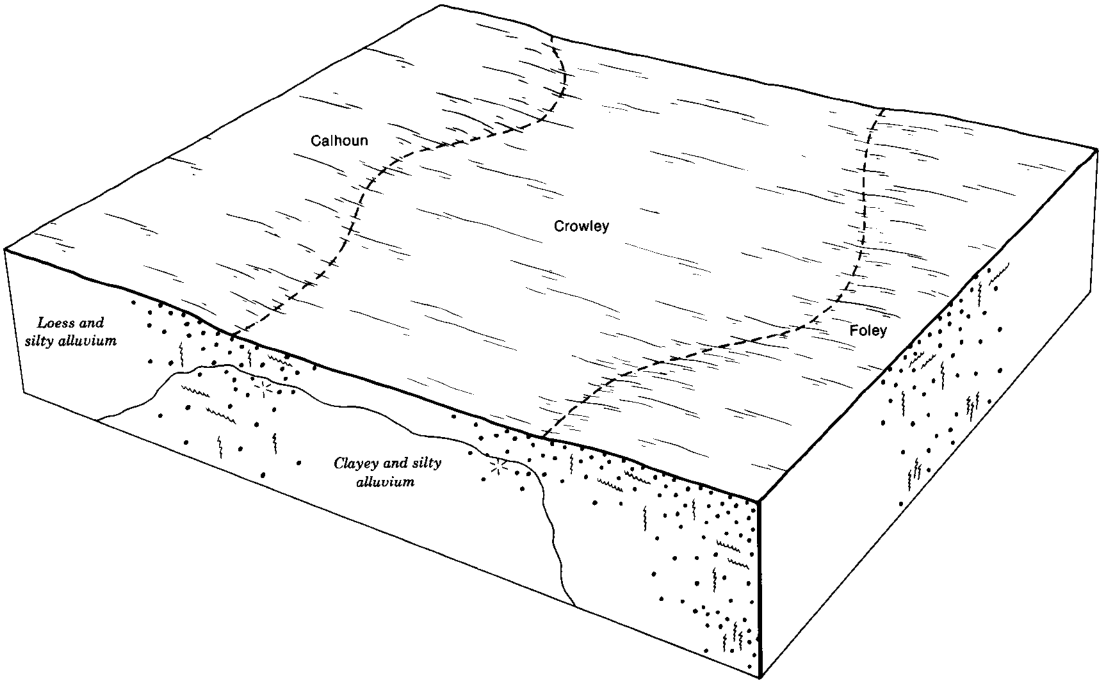

Figure 8.—Pattern of soils and underlying material in the Crowley-Calhoun-Foley association.

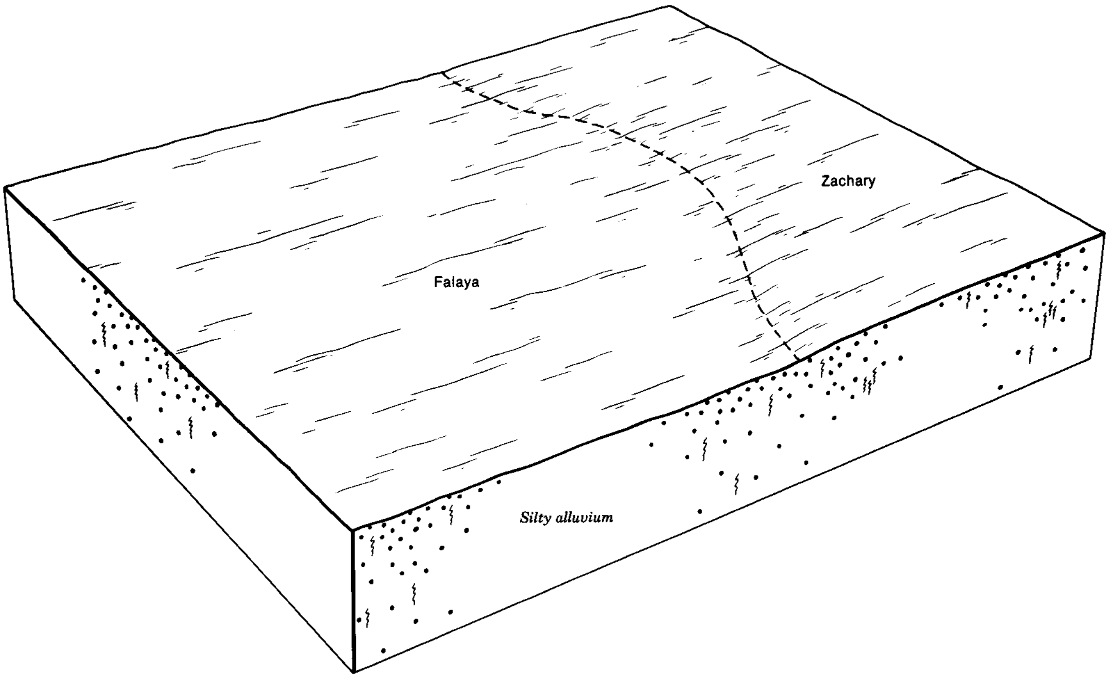

Figure 9.—Pattern of soils and underlying material in the Falaya-Zachary association.

The Falaya soils are somewhat poorly drained. They commonly are at about the same elevation as the Zachary soils; however, in some places they are on positions that are higher or lower than Zachary soils. Falaya soils have a dark brown, silt loam surface layer. The substratum, to a depth of about 32 inches, is brown, mottled; mottled gray and brown; light gray, mottled; and pale brown, mottled silt loam underlain with a light gray and dark yellowish brown, mottled, brittle, silt loam layer. Below this is a buried subsoil of pale brown, mottled, friable silt loam.

The Zachary soils are poorly drained and nearly level. They have a brown, silt loam surface layer and a light gray and light brownish gray subsurface layer. The subsoil is light brown, gray, light gray, and grayish brown silty clay loam.

Of minor extent are the moderately well drained Collins soils on higher natural levees.

Nearly all of this association is used for cultivated crops such as corn, grain sorghum, rice, soybeans, and wheat. A small acreage is used for urban and built-up areas.

These soils are suited to cultivated crops. Wetness, maintenance of organic matter, and soil tilth are the main concerns in management.

This association generally is unsuited to building site development and sanitary facilities. Wetness and flooding are the major concerns.

8. Crowley-Calhoun-Amagon association

Nearly level, somewhat poorly drained and poorly drained, silty soils; on terraces

This association consists of broad terraces dissected by low, narrow flood plains (fig. 10). The terraces are a few inches to a few feet higher than the narrow flood plains. Drainage ditches have been dug on most of the flood plains.

This association makes up about 18 percent of the county. It is about 40 percent Crowley soils, 34 percent Calhoun soils, 19 percent Amagon soils, and 7 percent minor soils.

The Crowley soils are somewhat poorly drained. They commonly are a few inches to a few feet higher in elevation than the Amagon soils and a few inches lower than the Calhoun soils. Crowley soils have a dark grayish brown, silt loam surface layer and a light gray, silt loam subsurface layer. The subsoil is grayish brown and light brownish gray, mottled silty clay.

Calhoun soils are poorly drained. They are a few inches higher in elevation than the Crowley soils. Calhoun soils have a brown, silt loam surface layer; a light gray, silt loam subsurface layer; and a light brownish gray, mottled, silty clay loam subsoil.

The Amagon soils are poorly drained. They are a few inches to a few feet lower in elevation than the Crowley soils. Amagon soils have a dark grayish brown, silt loam surface layer. The subsoil is light brownish gray, mottled and grayish brown silty clay loam in the upper part and light gray silt loam in the lower part.

Of minor extent are well drained Dubbs soils on higher natural levees.

Most of this association is used for cultivated crops such as corn, grain sorghum, rice, soybeans, and wheat. A small acreage is used for woodland and wildlife management areas.

These soils are suited to cultivated crops. They are particularly well suited to rice production and aquaculture because of the slow to very slow permeability of their subsoils. Wetness and maintenance of organic matter and soil tilth are the main concerns in management.

This association is suited to building site development and sanitary facilities except on low areas of the Amagon soils. Wetness and seasonal flooding are major concerns.

9. Convent association

Nearly level, somewhat poorly drained, silty soils; on flood plains

This association consists of flood plains of the former Whitewater River.

This association makes up about half of 1 percent of the county. It is about 76 percent Convent soils and 24 percent minor soils.

The Convent soils have a brown and dark grayish brown, silt loam surface layer. The substratum is grayish brown and light gray, mottled silt loam.

Of minor extent are Collins and Commerce soils on higher parts of the natural levees. The Collins soils are moderately well drained and the Commerce soils have more clay.

Nearly all of this association is used for cultivated crops such as corn, grain sorghum, soybeans, and wheat. A very small acreage is used for building sites.

These soils are well suited to cultivated crops. Wetness, drainage, and maintenance of organic matter and soil structure are the main concerns in management.

This association is suited to building site development and sanitary facilities only in areas that have been built up above the flood levels. Wetness and flooding are the main concerns.

Nearly level and gently sloping, well drained to excessively drained soils, on natural levees

These soils formed on a geomorphic landform with high, broad, natural levees. Corn, soybeans, cotton, grain sorghum, and winter wheat are extensively grown. Double cropping following wheat is common. Wind and water erosion, droughtiness, and maintenance of organic matter are the major management concerns. These soils generally are suited to building site development. Seepage is a major problem for sanitary facilities.

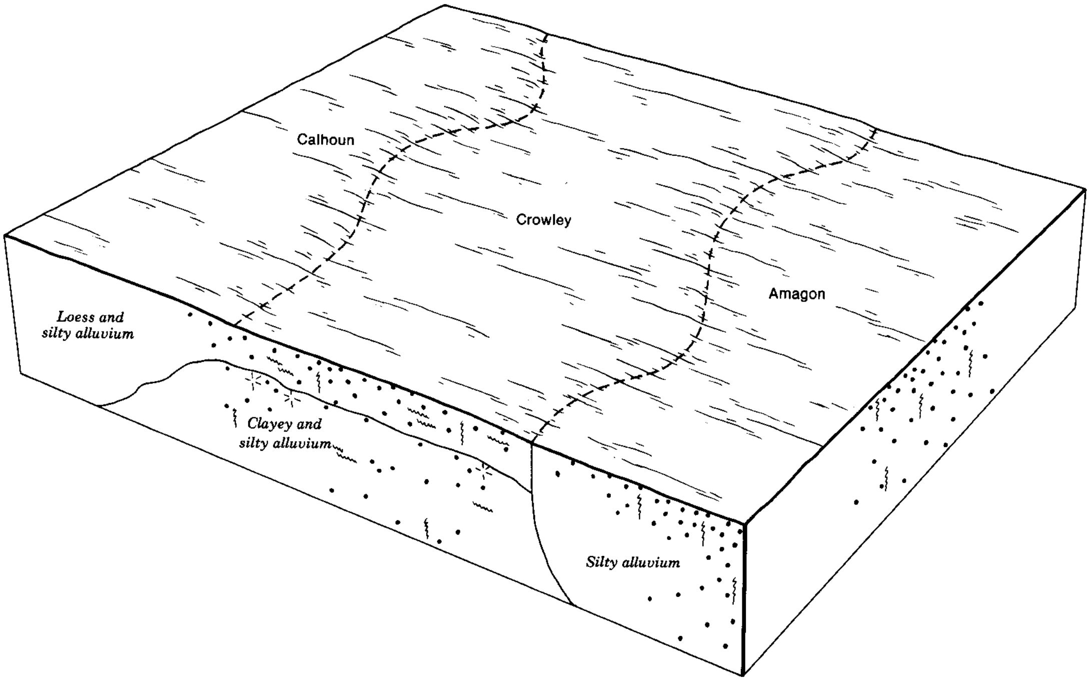

Figure 10.—Pattern of soils and underlying material in the Crowley-Calhoun-Amagon association.

10. Broseley-Malden-Dubbs association

Nearly level and gently sloping, well drained to excessively drained, sandy and silty soils; on natural levees

This association consists of high natural levees of former braided streams of the Ohio and Mississippi Rivers (fig. 11). The eastern edge of this association has a distinct north-south alignment and forms the border of a high terrace. Much of the surface appears flat and featureless because of land grading. The sandier areas have alternating ridges and swales oriented in a northeast to southwest direction.

This association makes up about 2 percent of the county. It is about 28 percent Broseley soils, 28 percent Malden soils, 25 percent Dubbs soils, and 19 percent minor soils.

The Broseley soils are somewhat excessively drained. They are a few inches higher in elevation than the Dubbs soils and at the same, or slightly lower, elevations as the Malden soils. Broseley soils have a dark yellowish brown, loamy fine sand surface layer and a brown and dark yellowish brown, loamy fine sand subsurface layer. The subsoil is yellowish brown and dark yellowish brown, mottled fine sandy loam. The substratum is yellowish brown, mottled, loose sand.

The Malden soils are excessively drained. They are at the same, or slightly higher, elevations as the Broseley soils and several inches to a few feet higher than the Dubbs soils. Malden soils have a dark brown, loamy sand surface and subsurface layer. The subsoil is dark yellowish brown and strong brown loamy sand. The substratum is dark yellowish brown sand.

The Dubbs soils are well drained. They typically are a few inches lower in elevation than the Broseley soils and several inches to a few feet lower than the Malden soils. Dubbs soils have a brown, silt loam surface layer and subsurface layer and a dark brown, silt loam and silty clay loam subsoil.

Of minor extent are moderately well drained Canalou soils on swales and low natural levees and somewhat poorly drained Dundee soils bordering in drainageways.

Most of the acreage of these soils is used for cultivated crops such as corn, cotton, grain sorghum, soybeans, and wheat. A small acreage is used for urban and built-up areas.

This association is well suited to cultivated crops and specialty crops such as melons and vegetables. Wind erosion, droughtiness, and maintenance of organic matter are major concerns in management.

This association is suited to building site development; however, centralized sewage treatment facilities are necessary to prevent contamination of ground water on the Broseley and Malden soils. A poor filtering capacity of the subsoils and substrata is a major concern in constructing sanitary facilities.

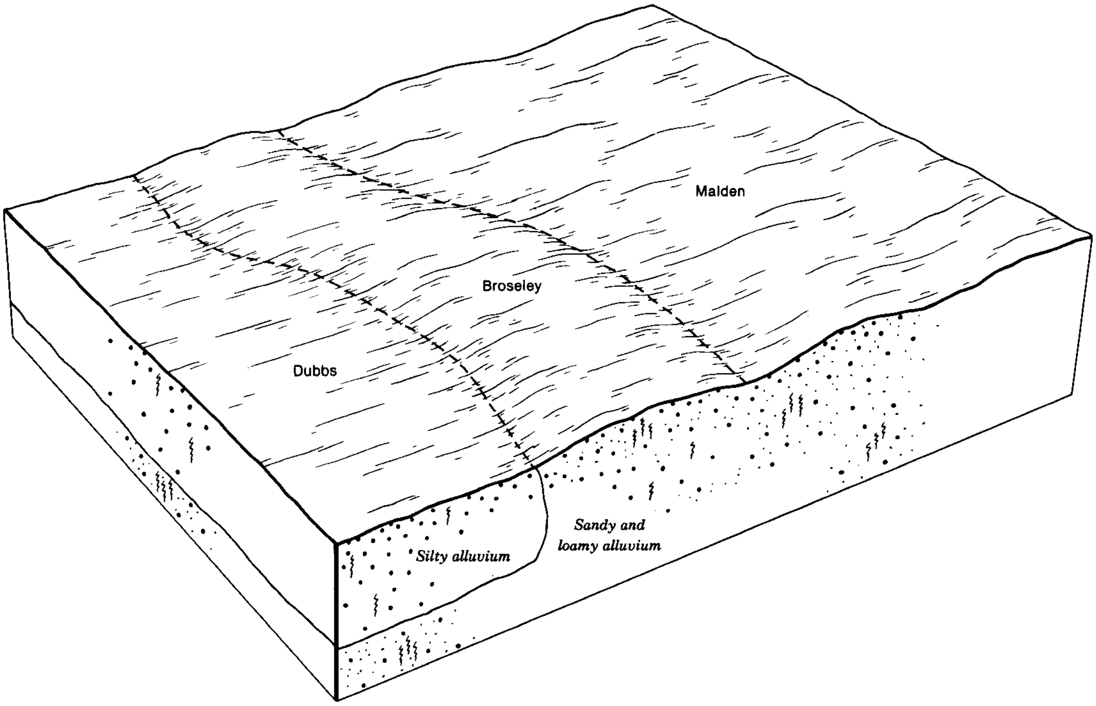

Figure 11.—Pattern of soils and underlying material in the Broseley-Malden-Dubbs association.

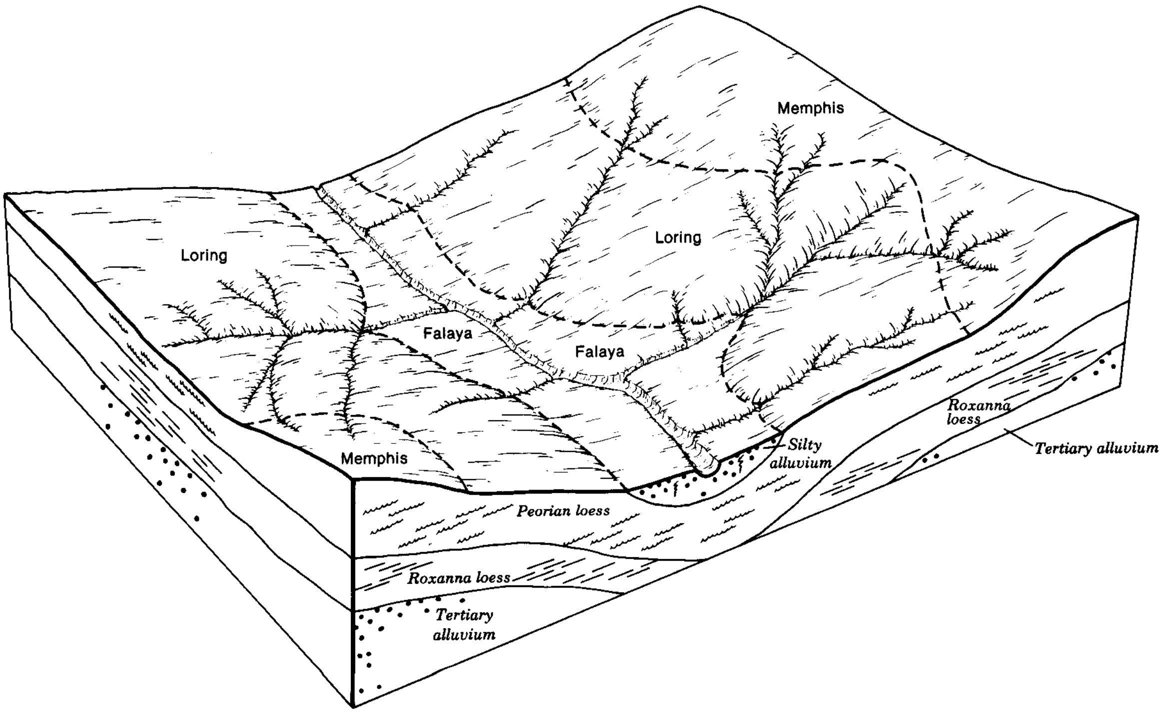

Figure 12.—Pattern of soils and underlying material in the Loring-Memphis-Falaya association.

Nearly level to very steep, well drained to somewhat poorly drained soils, on uplands and flood plains

These soils formed on a geomorphic landform with low loess-covered uplands isolated by the ancestral Mississippi River. Pasture, hay, orchards, and woodland are the principal uses of these soils. Erosion, wetness, and flooding are the major management concerns. The upland soils are suited to building site development and sanitary facilities. Slope is the main concern in construction.

11. Loring-Memphis-Falaya association

Nearly level to very steep, well drained to somewhat poorly drained, silty soils; on uplands and flood plains

This association consists of upland ridges dissected by narrow flood plains (fig. 12). The highest ridges commonly branch in several directions and have short to moderately long slopes. The lower ridges are less sloping and have broader ridgetops and longer side slopes. Valleys are relatively narrow, generally less than a quarter of a mile wide.

This association makes up about 26 percent of the county. It is about 53 percent Loring soils, 26 percent Memphis soils, 12 percent Falaya soils, and 9 percent minor soils.

Loring soils are moderately well drained and gently sloping to strongly sloping. They have a dark brown, silt loam surface layer. The upper part of the subsoil is yellowish brown silt loam; the middle part is yellowish brown, mottled silt loam; and the lower part is dark yellowish brown, mottled, firm and brittle silty clay loam and silt loam. The substratum is dark yellowish brown, mottled silt loam.

The Memphis soils are well drained and moderately sloping to steep. They have a dark brown, silt loam surface layer and a brown silt loam and dark brown and dark yellowish brown, silty clay loam subsoil.

The Falaya soils are somewhat poorly drained and nearly level. They have a dark brown, silt loam surface layer. The upper part of the subsoil is brown, light gray, and pale brown silt loam underlain with a light gray and dark yellowish brown, mottled, brittle, silt loam subsoil horizon. Below the brittle horizon, the subsoil is pale brown, friable silt loam.

Of minor extent in this association are Brandon and Eustis soils. The Brandon soils are on the high, narrow ridgetops and side slopes and have a gravelly layer at a depth of 26 to 40 inches. The Eustis soils, which are sandy and somewhat excessively drained, are on steep side slopes along the east edge of Crowley's Ridge.

The soils in this association are used mostly for pasture, hayland, orchards, vineyards, and woodland. Slope and a hazard of erosion are the main concerns in management.

The Loring and Memphis soils are suited to building sites and sanitary facilities. Slope is a major concern.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, *Loring silt loam, 5 to 9 percent slopes, eroded,* is one of several phases in the *Loring* series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. *Eustis-Memphis complex, 14 to 40 percent slopes,* is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. *Pits, gravel,* is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

1C—Brandon silt loam, 5 to 9 percent slopes. This is a well drained, moderately sloping soil on ridgetops and side slopes of uplands. Individual areas are long and narrow and range from 6 to 35 acres or more.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is brown and strong brown silty clay loam about 28 inches thick and is underlain by a gravelly sandy loam substratum. In severely eroded areas the silt loam surface layer is thinner and is up to 10 percent rounded gravel mixed from underlying layers.

Included with this soil in mapping are small areas of Loring and Memphis soils. The Loring soils have a brittle subsoil horizon and are on lower slopes and wider divides. The Memphis soils do not have gravel in the upper 40 inches and are on higher positions. These inclusions make up about 1 to 15 percent of the unit.

Permeability of this Brandon soil is moderate in the upper part and moderately rapid in the lower part. Reaction ranges from strongly acid to very strongly acid in the subsoil. Organic matter content is moderately low. Available water capacity is moderate. The surface layer is easily tilled but it tends to compact, puddle, and crust if tilled when it is wet. Natural fertility is low to medium.

Most areas are used for pasture and hay. Some areas are in woodland. This soil is suited to the cool-season crops common to the county. Pasture grasses and legumes respond well to lime and fertilizer. The use of this soil for pasture and hayland is an effective method of erosion control. Overgrazing or grazing when the soil is wet causes compaction, excessive runoff, and poor tilth. Proper stocking rates, deferred grazing, and pasture rotation are necessary to maintain the soil and pasture in good condition. This soil generally is not suitable for farm ponds because of the gravelly substratum.

When this soil is cultivated, the best erosion-control measures include stripcropping, terracing, grassed waterways, minimum tillage, or a combination of these practices. Residue management that provides protective cover will help to maintain tilth and aid in the control of erosion, especially where gullies and rills have exposed the subsoil.

This soil is suited to trees, and some areas remain in this use. Cuttings and seedlings grow well where competing vegetation is controlled by site preparation, spraying, or cutting. Timber stand improvement practices should be instituted in established forests.

This soil is suited to building site development but has limitations for onsite waste disposal systems. There are few limitations for buildings with basements and septic tank absorption fields. Sites can be leveled for lagoons, but bottoms and berms should be sealed to prevent contamination of ground water. A suitable base material should be added to strengthen this soil for roads and streets.

The land capability classification is IIIe. The woodland ordination symbol is 3o.

1D—Brandon silt loam, 9 to 14 percent slopes. This is a well drained, strongly sloping soil on ridgetops and side slopes of uplands. Individual areas are elongated and are from 6 to 160 acres or more.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is brown silt loam about 2 inches thick. The subsoil is about 40 inches thick. The upper part is brown silt loam; the middle part is strong brown silty clay loam; and the lower part is dark brown gravelly loam. The substratum is dark brown extremely gravelly loam and extremely gravelly sandy loam to a depth of 60 or more inches. In some eroded areas the silt loam surface layer is thinner and is 10 to 15 percent rounded gravel at the surface.

Included with this soil in mapping are small areas of Loring and Memphis soils. The Loring soils have a brittle subsoil horizon and are lower on the landscape. The Memphis soils do not have gravel within a depth of 40 inches and are on higher landscape positions. These inclusions make up less than 5 to 15 percent of the unit.

Permeability of this Brandon soil is moderate in the upper part and moderately rapid in the lower part. Surface runoff is medium. Reaction ranges from strongly acid to very strongly acid in the subsoil. Organic matter content is moderately low. Available water capacity is moderate. The surface layer is easily tilled but tends to puddle and crust if tilled when it is wet.

Most areas are used for pasture and hayland. Many small areas are in woodland. This soil is not suited to continuous cultivated crops. Row crops and small grains should be grown in rotation with close-growing pasture and hay crops. Protective amounts of residue left on the surface will reduce erosion in cultivated fields, especially where gullies and rills have exposed the subsoil.

This soil produces acceptable early spring and late fall hay and pasture yields from improved grasses and legumes. Erosion is a major hazard. Well-maintained ground cover of grasses and legumes or well-managed woodland is the best erosion control. This soil generally is not suited to farm ponds because of the gravelly substratum.

This soil is suited to trees, and many small areas remain in trees. Cuttings and seedlings grow well where competing vegetation is controlled by site preparation, spraying, or cutting. Woodland areas usually only need thinning or removal of undergrowth to encourage the better tree species.

This soil is suited to building site development but has limitations for onsite waste disposal. Slope is the only limitation for building sites and septic tank absorption fields. Lagoons can be used if sites can be leveled and the bottom and berms sealed to prevent contamination of the ground water. A suitable base material should be added to strengthen this soil for roads and streets.

The land capability classification is IVe. The woodland ordination symbol is 3o.

3B—Loring silt loam, 2 to 5 percent slopes. This is a gently sloping, moderately well drained soil on slightly convex ridgetops, narrow side slopes, and toe slopes or bench positions next to higher uplands. Individual areas are elongated and narrow, except on toe slopes of bench positions where the areas are about as wide as they are long. They range in size from 6 to more than 100 acres.

The surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 50 inches thick. The upper part of the subsoil is dark brown, friable silt loam and strong brown, mottled, firm silty clay loam; the middle part is firm, yellowish brown and dark yellowish brown, mottled, firm silty clay loam that tends to be slightly brittle; and the lower part is dark brown, mottled, firm silt loam. The substratum is dark brown, mottled silt loam to a depth of more than 60 inches. In some small eroded areas, the plow layer is silty clay loam as a result of being mixed with the subsoil.

Included with this soil in mapping are small areas of strongly sloping Loring soils adjacent to the small drains. These inclusions make up about 10 percent of the unit.

Permeability of this Loring soil is moderately slow in the subsoil. Surface runoff from cultivated areas is medium. Reaction ranges from medium acid to very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. Natural fertility is low to medium, and this soil responds well to additions of fertilizer and lime. Organic matter content is low or moderately low, and available water capacity is moderate. The surface layer is easily tilled over a wide range of moisture conditions. It tends to compact and crust if tilled when it is wet. Root development is somewhat limited by the brittle subsoil horizon. The water table perches within 2 or 3 feet of the surface during wet periods in winter and spring.

Most areas of this soil are used for pasture, hay, and row crops common to the area. Only a few small areas are still in native hardwoods. Other small areas of this soil produce peaches, pears, apples, and grapes. This soil is suited to orchard crops because its higher landscape position provides favorable air drainage.

This soil is suited to corn, soybeans, wheat, grain sorghum, peas, trees, orchards, and legumes and grasses for hay and pasture. When this soil is cultivated, there is a hazard of erosion. Conservation tillage, no-till, winter cover crops, stripcropping, terracing, and contour farming help prevent excessive soil loss. Residue management that provides protective cover on the surface will improve fertility, reduce compaction and crusting, help maintain organic matter, and reduce erosion.

The use of this soil for pasture and hay (fig. 13) is very effective in controlling erosion. It is suited to most grasses and legumes. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, and restricted use during wet periods are practices that keep the pasture and soil in better condition.

This soil is moderately well suited to trees. Seedlings and cuttings survive and grow well if competing vegetation is controlled or removed. This can be accomplished by site preparation, mowing, spraying, or prescribed burning. There are no other particular hazards or limitations in planting and harvesting trees.

This soil is suited to building site development and some onsite waste disposal systems. Septic tank absorption fields generally do not function adequately because of the moderately slow permeability. Sewage lagoons will function if the area is leveled. The bottoms and berms of lagoons should be sealed to prevent contamination of ground water. Damage caused by wetness to dwellings with basements can be prevented

Figure 13.—Meadow on Loring silt loam, 2 to 5 percent slopes.

by sealing the basement walls or providing an exterior drain, or both. The low strength and frost action are limitations for local roads and streets. The low strength can be improved by the addition of suitable base material. Grading the roads to shed water and providing adequate side ditches and culverts will help prevent damage by frost action.

The land capability classification is IIe. The woodland ordination symbol is 3o.

3C2—Loring silt loam, 5 to 9 percent slopes, eroded. This is a moderately sloping, moderately well drained soil on convex ridgetops and side slopes. It occurs on narrow ridgetops that have an irregularly branched appearance but mostly is on long, narrow side slopes. Individual areas are often elongated and range from 6 to 400 acres or more.

The surface layer is dark brown silt loam about 8 inches thick. The subsoil is about 44 inches thick. The upper part of the subsoil is yellowish brown, friable silt loam; the next part is yellowish brown, mottled, firm silt loam; and the lower part is dark yellowish brown, mottled, firm and brittle silty clay loam and silt loam. The substratum, to a depth of more than 72 inches, is dark yellowish brown, mottled, firm silt loam. In some severely eroded areas the surface is silty clay loam. Some areas on the narrow ridgetops are gently sloping.

Included with this soil in mapping are small steeper areas adjacent to the small drainageways. These inclusions make up 5 to 15 percent of the unit.

Permeabaility of this Loring soil is moderately slow in the more restrictive layers. Surface runoff from cultivated areas is medium, but it is slow from areas of well-established grasses and legumes. Reaction ranges from medium acid to very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. Natural fertility is low to medium, and this soil responds well to lime and fertilizer. Organic matter content is low or moderately low. Available water capacity is moderate. The surface is easily tilled over a wide range of moisture conditions, but tends to compact, puddle, and crust if tilled when it is wet. Root development is somewhat resticted by the brittle subsoil horizon. The water table perches at a depth of 2 to 3 feet during wet periods in winter and spring.

Most areas of this soil are used for pasture (fig. 14), hay, or row crops. A few small areas are used for orchards and woodland. Where erosion is controlled, this soil is suited to corn, soybeans, wheat, grain sorghum, peas, trees, orchards, vineyards, and legumes and grasses. If this soil is used for clean-tilled crops, there is a hazard of erosion. Terraces, grassed waterways, conservation tillage, no-till, winter cover crops, and contour farming can help prevent excessive soil loss. Residue management that provides protective cover on the surface will maintain or improve soil tilth and reduce erosion.

Some areas of this soil are used for grape vineyards and peach, pear, and apple orchards. This soil is well suited to these crops because its higher landscape position provides favorable air drainage. If the soil is exposed by clean cultivation, there is an erosion hazard. Conservation practices such as contour farming, terracing, no-till, minimum tillage, and grassed waterways help reduce runoff and control erosion. Residue management that provides protective cover on the surface will also maintain or improve fertility and organic matter content and reduce erosion. Water for spraying is often obtained from nearby ponds and lakes. Where lakes of sufficient size are available, most areas of the orchards and all of the present vineyards could be irrigated by trickle irrigation.

The use of this soil for pasture and hay is very effective in controlling excessive runoff from rains and reducing erosion. This soil is suited to most grasses and legumes. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, and restricted use during wet periods are practices essential to good pasture management.

This soil is moderately well suited to trees, but only a few areas remain in woodland. Seedlings and cuttings survive and grow well if plant competition is controlled or removed. This can be accomplished by site preparation, spraying, or prescribed burning. There are no other particular hazards or limitations for planting and harvesting trees.

This soil is suited to building site development and some onsite waste disposal systems. The slope presents some problems in sewage lagoon construction, but an area usually can be leveled for a site. The bottoms and berms of lagoons should be sealed to prevent contamination of the ground water. Septic tank absorption fields generally do not function adequately because of the moderately slow permeability. Damage caused by wetness to dwellings with basements can be reduced by sealing the basement walls or providing an exterior drain, or both. Low strength and frost action are limitations for local roads and streets. The strength can be increased by the addition of suitable base material. Grading the roads to shed water and providing adequate side ditches and culverts will help prevent damage caused by frost action.

The land capability classification is IIIe. The woodland ordination symbol is 3o.

3C3—Loring silt loam, 5 to 9 percent slopes, severely eroded. This is a moderately sloping, moderately well drained soil mostly on side slopes, but some areas are on ridgetops. Individual areas on side slopes are elongated and narrow. The ridgetops usually branch out and give a trellislike appearance on maps. Mapped areas range from 6 to 200 acres or more.

Figure 14.—Pasture on Loring silt loam, 2 to 5 percent slopes. Loring silt loam, 5 to 9 percent slopes, eroded, is in the background.

The surface layer is yellowish brown silt loam about 6 inches thick. The subsoil is about 54 inches thick. The upper part of the subsoil is yellowish brown, friable silty clay loam; the middle part is yellowish brown, mottled silty clay loam that tends to be brittle; and the lower part is firm, brittle, dark yellowish brown and yellowish brown, mottled silt loam. The substratum, to a depth of 60 inches or more, is yellowish brown, mottled silt loam. In some eroded areas the surface layer is silty clay loam. In some areas on the ridgetops the soil is less sloping and has a thicker surface layer.

Included with this soil in mapping are areas where the slope is more than 9 percent. These strongly sloping areas make up about 1 to 10 percent of the unit and are adjacent to the numerous small drainageways that dissect this soil.

Permeability of this Loring soil is moderately slow. Surface runoff from cultivated areas is usually medium, but it is rapid when the soil is saturated. Reaction ranges from medium acid to very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. Natural fertility is low to medium, and this soil responds well to fertilizer and lime. Organic matter content is low. Available water content is moderate. The surface is easily tilled over a wide range of moisture conditions but tends to compact and crust if tilled when it is wet. Root development of annual plants is somewhat restricted in and below the brittle subsoil horizon. The water table perches at a depth of 2 to 3 feet during wet periods in winter and spring.

Most areas of this soil are used for pasture and hay, row crops, and orchards. If erosion is controlled, this soil is suited to pasture, hayland, wheat, corn, soybeans, grain sorghum, woodland, and orchards. If this soil is cultivated, there is a hazard of rill and gully erosion. Good management includes using terraces, grassed waterways, conservation tillage, no-till, winter cover crops, contour farming, and other conservation practices that help prevent excessive soil erosion and surface runoff. Residue management that provides protective cover on the surface will help maintain or improve soil tilth and reduce erosion.

The use of this soil for pasture and hay is very effective in controlling excessive runoff and reducing erosion. This soil is suited to most grasses and legumes. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, and restricted use during wet periods are essential to good pasture management.

This soil is moderately well suited to trees, but only a few areas remain in woodland. Seedlings and cuttings survive and grow well if plant competition is controlled or removed. This can be accomplished by site preparation, spraying, or prescribed burning. There are no other particular hazards or limitations for planting and harvesting trees.

This soil is suited to building site development and some onsite waste disposal systems. The slope presents some problems in sewage lagoon construction, but areas can usually be leveled. The bottoms and berms of lagoons should be sealed to prevent contamination of ground water. Septic tank absorption fields generally do not function adequately because of the moderately slow permeability. Damage caused by wetness to dwellings with basements can be reduced by sealing the basement walls or providing an exterior drain, or both. Low strength and frost action are limitations for local roads and streets. The strength can be increased by the addition of suitable base material. Grading the roads to shed water and providing adequate side ditches and culverts will help prevent damage caused by frost action.

The land capability classification is IVe. The woodland ordination symbol is 3o.

3D2—Loring silt loam, 9 to 14 percent slopes, eroded. This is a strongly sloping, moderately well drained soil on side slopes and some ridgetops. Individual areas are either elongated and narrow on the ridgetops or they are broad and include drainageways. Size ranges from about 6 to 50 or more acres.

Typically, the surface layer is dark brown silt loam about 8 inches thick. In the subsoil, which is about 45 inches thick, the upper part is yellowish brown, firm silty clay loam; the middle part is yellowish brown, mottled, firm silty clay loam that tends to be brittle; and the lower part is dark yellowish brown, firm silty clay loam and dark brown silt loam. The substratum, to a depth of 60 inches or more, is dark yellowish brown, mottled silt loam. Some areas have small rills and shallow gullies. In some places the surface layer is silty clay loam.

Included with this soil in mapping are small areas of well drained Memphis soils in narrow bands on the ridgetops and in intermittent small spots or bands on the side slopes. These inclusions make up about 2 to 10 percent of the unit.

Permeability of this Loring soil is moderately slow. Surface runoff is rapid. Reaction ranges from medium to very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. This soil has low to medium natural fertility, and it responds well to lime and fertilizer. Organic matter content is low, and available water capacity is moderate. The surface is easily tilled over a wide range of moisture conditions. Eroded areas where the silty clay loam is exposed are more difficult to till and prepare into a suitable seedbed. The surface layer tends to compact, puddle, and crust if tilled when it is wet. Root development is somewhat restricted by the brittle subsoil horizon. The water table perches at a depth of 2 to 3 feet during wet periods in winter and spring.

Most areas of this soil are in pasture, hay, or woodland, but some areas are in row crops. This soil is suited to most grasses and legumes, trees, and orchards on the contour. It is suited to limited amounts of cultivated crops in rotation with close-growing pasture and hay crops. If the soil is cultivated for wheat, corn, soybeans, grain sorghum, or orchards, there is a hazard of erosion. Small rills and gullies a foot or more deep form after late summer or fall plowing. Good management includes using terraces, grassed waterways, contour farming, conservation tillage, no-till, winter cover crops, and other conservation practices that help prevent excessive soil erosion, surface runoff, and downstream sedimentation. Residue management that provides protective cover improves fertility, reduces crusting and compaction, helps maintain organic matter, and reduces erosion. Mechanical practices are needed on most eroded areas to retard further erosion.

This soil is suited to orchard crops, in part, because of the favorable air drainage provided by its position on the landscape. If the soil is exposed, however, there is a hazard of erosion. No-till, minimum tillage, grassed waterways, and other conservation practices are necessary to prevent excessive soil and water losses. Planting trees on the contour with diversions is an effective water-management practice. Most areas are not uniform or smooth enough for efficient use of parallel terraces.

This soil is suited to most grasses and legumes for pasture and hay, and under proper management these uses effectively control erosion. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, and restricted use during wet periods are necessary to maintain proper stands of grasses and legumes and to keep the soil in good condition.

This soil is suited to trees, but only a few areas remain in woodland. Seedlings and cuttings survive and grow well if competing vegetation is controlled or removed. This can be accomplished by site preparation, spraying, or controlled burning. There are no other particular hazards or limitations for planting and harvesting.

This soil is suited to building site development and some onsite waste disposal systems. The slope limits the proper construction of sewage lagoons, but areas usually can be shaped and leveled or sewage can be piped to adjacent soils that are suitable. The bottoms and berms of lagoons should be sealed to prevent contamination of ground water. Septic tank absorption fields generally do not function because of the moderately slow permeability. Wetness and the slope are limitations for dwellings. Foundations, basement walls, and footings should be designed to prevent damage caused by excessive wetness. This usually requires sealing walls and providing foundation and footing drains. Dwellings can be designed to conform to the natural slope of the land. Land shaping may be necessary in some areas. Local roads and streets should be strengthened by adding a suitable base material. Grading the roads to shed water and providing side ditches and culverts will help prevent damage by frost action. Some cuts and fills may be necessary because of the slope.

The land capability classification is IVe. The woodland ordination symbol is 3o.

3D3—Loring silt loam, 9 to 14 percent slopes, severely eroded. This is a strongly sloping, moderately well drained soil on side slopes and some ridgetops. Individual areas are elongated and narrow on the ridgetops or they are broad and include drainageways. Size ranges from about 6 to 50 or more acres.

Typically, the surface layer is brown silt loam about 3 inches thick. The subsoil is about 29 inches thick. The upper part of the subsoil is friable, dark brown silty clay loam; the middle part is firm, dark yellowish brown, mottled silty clay loam that tends to be brittle; and the lower part of the subsoil is firm, dark yellowish brown silty clay loam and dark brown silt loam. The substratum, to a depth of more than 60 inches, is dark brown, mottled silt loam. In some areas the surface layer is silty clay loam as a result of erosion. In some areas on ridgetops the surface layer is thicker and is brown silt loam.

Included with this soil in mapping are small areas of well drained Brandon and Memphis soils. These soils occur as narrow bands on the ridgetops and as intermittent small spots or bands on the side slopes. These inclusions make up about 5 to 15 percent of the unit.

Permeability of this Loring soil is moderately slow. Surface runoff is rapid. Reaction ranges from medium to very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. This soil is low in natural fertility, and it responds well to lime and fertilizer. Organic matter content is low, and available water capacity is moderate. The surface is somewhat difficult to till because rills and gullies interfere with the operation of machinery. The surface layer tends to compact, puddle, and crust if tilled when it is wet. Root development is somewhat restricted in the brittle subsoil horizon. The water table perches at a depth of 2 to 3 feet during wet periods in winter and spring.

Most areas of this soil are in pasture, hay, or woodland, but some areas are in row crops. This soil generally is unsuited to row crops because of the severe erosion hazard. It is suited to grasses and legumes, trees, and uncultivated orchards.

This soil is suited to orchards, in part, because of the favorable air drainage provided by its position on the landscape. If the soil is exposed, however, there is a hazard of excessive erosion. No-till, minimum tillage, grassed waterways, and other conservation practices are necessary to prevent excessive soil and water losses. Planting trees on the contour with diversions is an effective water-management practice. Most areas are not uniform or smooth enough for efficient use of parallel terraces.

This soil is suited to most grasses and legumes for pasture and hay, and under proper management these uses can effectively control erosion. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, and restrictive use during wet periods are necessary to maintain good stands of grasses and legumes and to keep the soil in good condition.

This soil is suited to trees, but only a few areas remain in woodland. Seedlings and cuttings survive and grow well if competing vegetation is controlled or removed. This can be accomplished by site preparation, spraying, or controlled burning. There are only slight limitations for planting and harvesting trees.

This soil is suited to building site development and some onsite waste disposal systems. The slope limits the proper construction of sewage lagoons, but areas usually can be shaped and leveled or sewage can be piped to adjacent soils that are suitable. The bottoms and berms of lagoons should be sealed to prevent contamination of ground water. Septic tank absorption fields generally do not function adequately because of the moderately slow permeability. Wetness and slope are limitations for dwellings. Foundations, basement walls, and footings should be designed to prevent damage caused by excessive wetness. This usually requires sealing walls and providing foundation and footing drains. Dwellings can be designed to conform to the natural slope of the land. Land shaping may be necessary in some areas. Local roads and streets should be strengthened by adding a suitable base material. Grading the roads to shed water and providing side ditches and culverts will help prevent damage by frost action. Some cutting and filling may be necessary because of the slope.

The land capability classification is VIe. The woodland ordination symbol is 3o.

5C2—Memphis silt loam, 5 to 9 percent slopes, eroded. This is a moderately sloping, well drained soil on convex ridgetops and side slopes of uplands. Individual areas are long and narrow on the ridgetops and usually abutt the elongated side slopes. Areas range from 6 to more than 200 acres.

Typically, the surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil extends to a depth of about 60 inches or more. The upper part of the subsoil is dark yellowish brown, friable silt loam; the middle part is dark yellowish brown and yellowish brown, firm silty clay loam; and the lower part is dark yellowish brown silt loam. In some eroded areas the surface layer is silty clay loam.

Included with this soil in mapping are small areas of moderately well drained Loring soils in flat or concave areas or saddles of the ridgetops and in small, gently sloping areas adjacent to the bottom lands. These inclusions make up about 2 to 10 percent of the unit.

Permeability of this Memphis soil is moderate, and surface runoff is medium. Reaction ranges from medium acid through very strongly acid in the subsoil but commonly is neutral in the surface layer as a result of local liming practices. Natural fertility is medium, and this soil responds well to lime and fertilizer. The available water capacity is high, and organic matter content is moderately low. The surface layer is friable and easily tilled over a wide range of moisture conditions. It tends to compact, puddle, and crust if tilled when it is wet.

Most areas of this soil are used for pasture, hay, or row crops, but some are used for orchards. This soil is suited to soybeans, corn, wheat, grain sorghum, and grasses and legumes. Where this soil is cultivated, erosion is a major hazard. Terraces, no-till, conservation tillage, cover crops, grassed waterways, and contour farming are conservation practices that minimize soil losses. Residue management that provides protective cover on the surface will help maintain or improve fertility, reduce compaction and crusting, and aid water infiltration.

This soil is also used for apple, peach, and pear orchards, and some small grape vineyards. It is well suited to these crops because of the favorable air drainage provided by its position on the landscape. Areas in orchards are easily eroded when the winter cover crops are turned under and the surface is left bare. Terracing or planting on the contour helps to control erosion. Grassed waterways help minimize soil loss when water collects in channels. Returning crop residue to the surface helps improve fertility, reduce crusting, and increase water infiltration.

The use of this soil for pasture and hay is an effective method of controlling erosion. This soil is suited to most grasses and legumes. Overgrazing or grazing when the soil is wet results in surface compaction, excessive runoff, and poor tilth. The use of equipment when the soil is wet has the same effect. Proper stocking rates, restricted use during wet periods, and rotation of grazing are necessary to keep the soil and plant cover in good condition. Ponds can be constructed to provide water for livestock.

This soil is suited to trees, but only a few small areas remain in woodland. Tree cuttings and seedlings survive and grow well when competing vegetation is controlled. This can be done by site preparation, spraying, cutting, or girdling. There are no hazards or limitations for planting and harvesting trees.

This soil is suitable for building site development and for onsite waste disposal systems. Septic tank absorption fields will function if laterals are properly constructed and lengthened to compensate for the moderate permeability. Sewage lagoons will function if sites are leveled and if the sides, bottoms, and berms of lagoons are sealed to prevent seepage. Local roads and streets can be strengthened by adding suitable base material. Sand and gravel are mined in some areas from deposits underlying this and other Memphis soils.

The land capability classification is IIIe. The woodland ordination symbol is 2o.

5C3—Memphis silt loam, 5 to 9 percent slopes, severely eroded. This is a moderately sloping, well drained soil on convex ridgetops and side slopes. Individual areas are long and narrow on the ridgetops and usually abutt the elongated side slopes. Areas range from 6 to 60 acres or more.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 55 inches or more thick. The upper part of the subsoil is brown, friable silt loam; the remainder is dark brown and dark yellowish brown, firm silty clay loam. In some places where erosion has not been severe, the silt loam surface layer is more than 7 inches thick.

Included with this soil in mapping are small areas of moderately well drained Loring soils in concave areas or saddles of the ridgetops and on small, gently sloping areas adjacent to the bottom lands. These inclusions make up about 10 percent of the unit.

Permeability of this Memphis soil is moderate, and surface runoff is medium to rapid. Reaction ranges from medium through very strongly acid in the subsoil, but is often higher in the surface layer as a result of local liming practices. Natural fertility is medium, and this soil responds well to lime and fertilizer. The available water capacity is high, and organic matter content is moderately low. The surface layer is friable and easily tilled over a wide range of moisture conditions. It tends to compact, puddle, and crust over if tilled when it is wet.

Most areas of this soil are used for pasture, hay, or row crops. This soil is suited to soybeans, corn, wheat, grain sorghum, and grasses and legumes. Where it is cultivated, erosion is the major hazard. Terraces, no-till, conservation tillage, cover crops, grassed waterways, and contour farming are conservation practices that minimize soil losses. Residue management that provides a protective cover on the surface will help maintain or improve fertility, reduce compaction and crusting, and aid water infiltration.

This soil is also used for orchards and some small vineyards. It is well suited to these crops, in part, because of favorable air drainage provided by its position on the landscape. Areas in orchards are easily eroded when the winter cover crops are turned under and the surface is left bare. Terracing and planting on the contour help control erosion. Grassed waterways help minimize soil loss when water collects in channels. Returning crop residue to the soil helps improve fertility, reduce crusting, and increase water infiltration. Some areas could be drip or trickle irrigated with water from farm ponds and small lakes.

The use of this soil for pasture and hay is an effective method of controlling erosion. This soil is suited to most grasses and legumes. Overgrazing or grazing when the soil is wet results in surface compaction, excessive runoff, and poor tilth. The use of equipment when the soil is wet has the same effect. Rills and small gullies can cause difficulty with the operation of equipment in some areas. Proper stocking rates, restricted use during wet periods, and rotation of grazing are necessary to maintain the soil and plant cover in good condition. Ponds can be constructed to provide water for livestock.

This soil is suited to trees, but only a few small areas remain in woodland. Tree cuttings and seedlings survive and grow well when competing vegetation is controlled. This can be done by site preparation, spraying, cutting, or girdling. There are no other limitations or hazards for planting and harvesting trees.

This soil is suitable for building site development and for onsite waste disposal systems. Septic tank absorption fields will function if laterals are properly constructed and lengthened to compensate for the moderate permeability. Sewage lagoons will function if sites are leveled and the sides and bottoms of lagoons are sealed to prevent seepage. Roads and streets can be strengthened by adding suitable base material. Coastal plains sand and gravel are sometimes mined from deposits underlying this and other Memphis soils.

The land capability classification is IIIe. The woodland ordination symbol is 2o.

5D3—Memphis silt loam, 9 to 14 percent slopes, severely eroded. This is a strongly sloping, well drained soil on side slopes adjacent to streams or at the upper end of valleys. Individual areas along the streams are often narrow and elongated, and areas at the heads of valleys commonly are irregular in shape. Size ranges from 6 to 40 acres or more.

Typically, the surface layer is dark yellowish brown silt loam about 2 inches thick. The subsoil, about 62 inches thick, is uniform brown silty clay loam. The substratum, to a depth of 78 inches or more, is dark yellowish brown silt loam. In some less eroded areas the silt loam surface is thicker. Some small areas have slopes less than 9 percent, and a few small areas have slopes of more than 14 percent.

Included with this soil in mapping are small areas of well drained Brandon soils and moderately well drained Loring soils. The Brandon soils have gravelly layers in the lower part and occur as narrow bands at the upper limits of the steeper slopes. The Loring soils occur along the lower limits adjacent to the streams. These inclusions make up about 2 to 10 percent of the unit.

Permeability of this Memphis soil is moderate, and surface runoff is medium or rapid. Reaction ranges from medium acid through very strongly acid in the subsoil, but commonly is neutral in the surface layer as a result of local liming practices. Natural fertility is medium, and the response is good to lime and fertilizer. The available water capacity is high, and the organic matter content is moderately low. The surface layer is friable and easily tilled over a wide range of moisture conditions, but it tends to puddle and crust if tilled when it is wet.

Most areas of this soil are used for pasture, hay, or woodland. This soil is generally not suited to cultivated crops because of the severe hazard of erosion.

This soil is suited to most grasses and legumes for pasture and hay, and under good management these uses effectively control erosion. Overgrazing or grazing when the soil is wet causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, deferred grazing, and pasture rotation are necessary to maintain the soil and pasture in good condition. Small ponds can be constructed to provide water for livestock.

This soil is suited to trees, and many areas remain in woodland. Cuttings and seedlings survive and grow well where competing vegetation is controlled. This can be done by site preparation, spraying, or cutting and girdling. This soil has no other hazards or limitations for planting trees.

This soil is suited to building site development and some onsite waste disposal systems. Septic tank absorption fields can be designed to conform to the natural slope and laterals properly constructed and lengthened to overcome the slope and moderate permeability. Dwellings can be designed to fit the slope, or some land shaping may be necessary. Local roads and streets can be strengthened by the addition of suitable base material. Coastal plains sand and gravel are mined from the underlying geological material in some areas.

The land capability classification is VIe. The woodland ordination symbol is 2o.

5F—Memphis silt loam, 14 to 40 percent slopes. This is a moderately steep to very steep, well drained soil on side slopes along the eastern outer boundary of Crowley's Ridge and at the upper end of valleys. Individual areas are long and narrow and parallel the ridgetops. Size ranges from 6 to 200 acres or more.

Typically, the surface layer is very dark brown silt loam about 4 inches thick. The subsoil, which is about 56 inches thick, is firm, dark yellowish brown silt loam and silty clay loam. In some areas the surface layer is silty clay loam and is dissected by small rills and gullies.

Included with this soil in mapping are pockets of sand, gravel, or clay. These inclusions are throughout the unit and make up about 2 to 10 percent of the unit.

Permeability of this Memphis soil is moderate, and surface runoff is rapid. Reaction ranges from medium acid through very strongly acid in the subsoil. Natural fertility is medium, and the soil responds well to lime and fertilizer. The available water capacity is high, and organic matter content is moderately low.

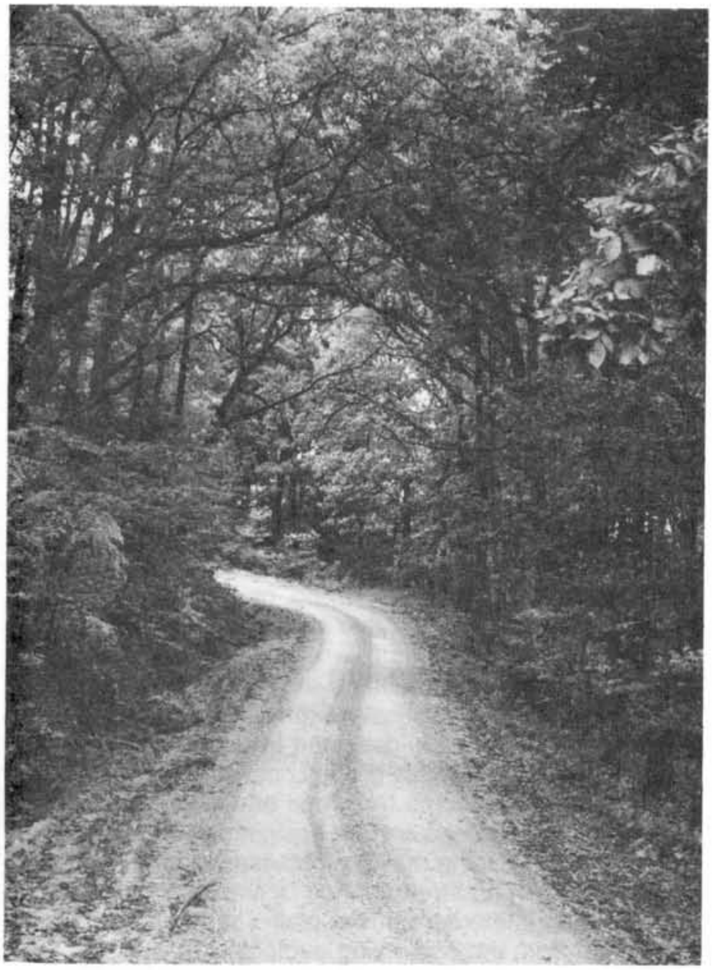

Figure 15.—Scenic road and good stand of timber on Memphis silt loam, 14 to 40 percent slopes.

Most areas of this soil are used for woodland (fig. 15). This soil is not suited to cultivated crops because of the steep slopes and severe erosion hazard. Growing grasses, legumes, trees, and other permanent vegetation are suitable uses that effectively control erosion.

This soil is suited to most grasses and legumes for pasture and hay. Grazing when the soil is wet and overgrazing cause surface compaction, excessive runoff, poor tilth, and erosion. Proper stocking rates and restricted use during wet periods keep the soil and pasture in good condition. Ponds can be constructed to provide water for livestock.

This soil is suited to trees, and most areas remain in woodland. The use of this soil for woodland is the most effective way to control excessive erosion. Tree seeds, cuttings, and seedlings survive and grow well where competing vegetation is controlled. This can be done by site preparation, spraying, cutting, or girdling. While there are no particular hazards or limitations for planting trees, an erosion hazard exists when harvesting on these steep slopes. To prevent excessive soil losses, logging roads should be built on the contour; cut banks should be sown to grasses and legumes, mulched, or otherwise protected; and all skid trails, logging roads, and other exposed soil areas should be reseeded to grasses or legumes following harvest.

This soil generally is not suited to building site development and onsite waste disposal systems because of the steep slopes. Seepage and the slope limit the use of this soil for pond reservoirs. Under this soil in some areas are sandy and gravelly layers that also present seepage problems. These seepage problems generally can be overcome by adequate core trenching beneath the dam, by overexcavating (undercutting) the sandy and gravelly layers, by backfilling with a less permeable material that is suitable, and by sealing the pond bottom with clay or other sealants.

The land capability classification is VIe. The woodland ordination symbol is 2r.

6F—Eustis-Memphis complex, 14 to 40 percent slopes. This map unit consists of moderately steep to very steep, somewhat excessively drained and well drained soils on side slopes of the upland on the east face of Crowley's Ridge. The Eustis soils are mostly on the lower two-thirds of the slope, and the Memphis soils are on the upper one-third of the slope. Mapped areas are about 60 to 1,000 acres or more. This complex is about 60 to 70 percent Eustis soils and about 20 to 30 percent Memphis soils. Areas of these soils occur in such an intermingled pattern that it was not practical to map them separately.

Typically, the Eustis soils have a surface layer of very dark grayish brown loamy sand about 2 inches thick. The subsurface layer, about 31 inches thick, is yellowish brown sand. Below this is a mixed layer of pale brown sand and strong brown loamy sand about 7 inches thick. The subsoil, to a depth of 78 inches or more, is reddish yellow, very friable loamy sand.

Typically, the Memphis soils have a very dark grayish brown silt loam surface about 4 inches thick. The subsoil, which is about 39 inches thick, is dark yellowish brown silt loam and silty clay loam. The substratum is yellowish brown silt loam to a depth of 60 inches or more. The profile is loamy throughout in some areas.

Included with these soils in mapping are small areas of well drained Brandon soils and one outcrop of a soil formed from Porter's Creek Clay. The Brandon soils are gravelly in the lower part and are on the same position as the Memphis soils. The soil formed from Porter's Creek Clay is on the same landform as the Eustis soils but is silty clay loam and silty clay. These inclusions make up about 1 to 15 percent of some areas.

Permeability of the Eustis soils is rapid, available water capacity is low, and runoff is slow. Reaction in the subsoil is strongly acid to very strongly acid. Natural fertility is low, and organic matter content is low.

In the Memphis soils, the permeability is moderate and surface runoff is rapid. Reaction is medium acid to very strongly acid. Natural fertility is medium, and available water capacity is high. Organic matter content is moderately low.

If these soils are used for pasture, proper management is essential to prevent erosion and compaction. Grazing when wet and overgrazing can cause excessive runoff, poor tilth, and excessive erosion. Proper stocking rates and restricted use during wet weather are good management practices that help keep the soil in good condition. Water can be provided by constructing ponds in the Memphis soils or developing natural springs that occur near the bottom of slopes.

Most of this complex is in woodland. These soils are suited to trees. Tree seeds, cuttings, and seedlings are not limited on the Memphis soils but are limited by droughtiness on the Eustis soils. Control of plant competition by site preparation, spraying, girdling, or cutting is necessary for maximum seedling growth. Planting large stock will help survival. Harvesting on steep slopes presents a hazard and an erosion problem. To alleviate this, construct logging roads on the contour, sow all exposed soil areas immediately after harvest, and maintain as much leaf litter as possible on the surface. Yarding logs uphill to skid trails and roads may be necessary in the steeper areas.

These soils generally are not suited to building site development and onsite waste disposal systems because of the steep slopes and slumping.

The land capability classification is VIIs and the woodland ordination symbol is 3r for the Eustis soils. The land capability classification is VIe and the woodland ordination symbol is 2r for the Memphis soils.

13B—Askew silt loam, 1 to 4 percent slopes. This is a gently sloping, moderately well drained soil on natural levees or low terraces. Individual areas are elongated along braided channels of former streams.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 40 inches thick. The upper part of the subsoil is yellowish brown, mottled silt loam; the middle part is light brownish gray, mottled silty clay loam; and the lower part is light brownish gray, mottled loam. The substratum, to a depth of 60 inches or more, is brown, fine sandy loam. In some areas on breaks, slopes are more than 4 percent.

Included with this soil in mapping are small areas of somewhat poorly drained Dundee and moderately well drained Canalou and Farrenburg soils. The Dundee soils are on the slightly lower parts of natural levees and in slightly concave drainageways. The Canalou soils are on similar locations but are sandier and have less clay and silt. The Farrenburg soils are on similar landscapes but contain more sand. These inclusions make up about 1 to 10 percent of the unit.

Permeability of this Askew soil is moderate, and runoff is slow. The available water capacity is high. The reaction in the subsoil is medium acid to strongly acid, but as a result of local liming practices and mildly alkaline irrigation water it ranges from strongly acid through neutral. Natural fertility is low, and organic matter content is moderately low. The water table perches at a depth of 1 foot to 2 feet during wet periods in winter and spring. The surface layer is friable and easily tilled over a wide range of soil moisture, but it tends to puddle and crust if tilled when it is wet or if exposed to hard torrential rains.

Most areas of this soil are used for crops. This soil is suited to soybeans, cotton, wheat, corn, grain sorghum, and grasses and legumes. The subsoil is saturated during wet periods of winter and spring. Some areas have a thin sandy overfill that is subject to soil blowing if unprotected. Winter cover crops, stripcrops, and incorporating residue in and on the surface layer help control erosion, maintain organic matter content, and increase water infiltration. Excess surface water can ordinarily be removed by field ditching. Restricted use of machinery during wet periods helps prevent surface compaction and formation of a traffic pan.

This soil is suited to trees. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suited to most building site developments and onsite waste systems, although wetness from the water table is a limitation. The shrink-swell potential is a limitation. Dwellings and small buildings without basements function satisfactorily when properly designed and protected from wetness. Adequate reinforcement of footings will help prevent damage caused by shrinking and swelling of the soil. Drainage tile around footings and foundations will help prevent damage caused by wetness. Lagoons can be sealed to prevent seepage. Adding suitable base material improves local roads and helps prevent damage caused by low strength.

The land capability classification is IIw. The woodland ordination symbol is 2o.

15D—Goss cherty silt loam, 9 to 14 percent slopes. This is a strongly sloping, well drained soil on convex ridgetops and side slopes of uplands. Areas are elongated and narrow and about 6 to 40 acres or more.

Typically, the surface layer is very dark grayish brown cherty silt loam about 3 inches thick. The subsoil is about 57 inches or more thick. The upper part of the subsoil is brown, firm cherty silty clay loam, and the lower part is brown, very cherty silty clay. In some places, the original surface layer has been removed by erosion and the present surface layer is reddish brown cherty silty clay loam.

Included with this soil in mapping are small areas of well drained Brandon and Memphis soils. The Brandon soils do not have a cherty surface layer. The Memphis soils are on the same location but do not have chert in the upper 40 inches. These inclusions make up about 2 to 15 percent of the unit.

Permeability of this Goss soil is moderate, and surface runoff is medium or rapid. Reaction ranges from extremely acid to strongly acid. Natural fertility is low, and organic matter content is moderately low. The available water capacity is low.

This soil is suited to grasses and legumes for hay and pasture. The use of this soil for pasture and hay helps control erosion. Overgrazing or grazing when the soil is wet, however, causes compaction, excessive runoff, and poor tilth. Proper stocking rates and restricted use during wet weather help maintain the soil and pasture in good condition.

This soil is suited to trees. Many areas are in timber or woodlots. Timber stand improvement practices will upgrade existing stands and help establish desirable species. This soil has limitations for seedling survival and the operation of equipment. Because of chert it may be necessary to plant by hand or direct seeding.

This soil is suitable for building site development and certain onsite waste disposal systems. A shrink-swell potential, large stones, and the slope are limitations for dwellings. Extra reinforcement and backfilling with sand and gravel will help prevent damage from shrinking and swelling. Stones that interfere with construction can be removed. Dwellings can be designed to fit the natural slope, or some land shaping may be necessary. Septic tank absorption fields can be designed and constructed to fit the slope, and longer laterals can be installed to overcome the moderate permeability and reduced capacity caused by chert content. Also, sewage usually can be piped to adjacent soils that are more suitable for onsite waste disposal. Local roads and streets should be designed on the contour to minimize the slope, or some cutting and filling may be necessary. Adequate drainage with side ditches and culverts will help prevent damage caused by shrinking and swelling of the soil and frost action. The addition of suitable base material will help prevent damage caused by low strength.

The land capability classification is VIs. The woodland ordination symbol is 4f.

15F—Goss cherty silt loam, 14 to 40 percent slopes. This is a steep to moderately steep, very well drained soil on side slopes of uplands. Areas are long and narrow and parallel the ridgetops. They are about 6 to 200 acres or more.

Typically, the surface layer is very dark grayish brown cherty silt loam about 3 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is yellowish brown, friable to firm very cherty silt loam; the middle part is brown, firm very cherty silty clay; and the lower part is brown extremely cherty clay. In some places the surface layer is brown very cherty silty clay loam.

Included with this soil in mapping are small areas of well drained Brandon and Memphis soils. The Brandon soils generally do not have chert in the surface layer, and the Memphis soils do not have chert in the upper 40 inches. These inclusions make up about 2 to 15 percent of the unit.

Permeability of this Goss soil is moderate, and the surface runoff is rapid. Reaction ranges from extremely acid to strongly acid. The natural fertility is low. The available water capacity and organic matter content are low.

This soil is not suited to row crops, but in the less sloping areas it is moderately suited to pasture and hay crops. Most of the areas are in timber.

This soil is suited to trees. The use of timber stand improvement practices will upgrade existing stands and help establish desirable species. The slope, the chert, and seedling mortality are limitations for planting and harvesting trees. Locating logging roads and skid trails on the contour will help minimize the steepness and length of slopes. It may be necessary to yard logs uphill to roads and trails. Because of the slope and chert it may be necessary to plant seedlings by hand or use direct seeding. Planting larger stock helps achieve higher survival rates.

This soil generally is not suited to building site development and onsite waste disposal systems because of the steepness of slope.

The land capability classification is VIIs. The woodland ordination symbol is 4f.

16C2—Shadygrove loam, 5 to 9 percent slopes, eroded. This is a moderately sloping, moderately well drained soil on the toe slope of the east face of Crowley's Ridge. The only area is long and narrow, generally oriented in a north-south direction, and is about 323 acres.

Typically, the surface layer is very dark grayish brown loam about 5 inches thick. The subsoil extends to 60 inches or more. It is dark yellowish brown, friable to firm clay loam in the upper part; brown, firm clay loam in the middle part; and light yellowish brown, grayish brown, and light brownish gray clay loam in the lower part. In places there is rounded gravel mixed in the profile, and in some places the surface layer is deeper. In places, small pieces of unconsolidated Porter's Creek Clay are at a moderate depth.

Permeability of this soil is slow, and surface runoff is moderate to rapid. Reaction is medium acid to extremely acid in the subsoil, but the surface layer ranges to neutral as a result of local liming practices. Natural fertility is moderate to high, and organic matter content is low. Available water capacity is high. The water table perches at a depth of 2 to 4 feet during wet periods in winter and spring. The surface layer is friable but during wet conditions tends to puddle and crust.

Most areas of this soil are used for crops and pasture. This soil is suited to soybeans, grain sorghum, wheat, and grasses and legumes for hay and pasture. The slope presents an erosion hazard if this soil is cultivated. No-till, minimum tillage, contour farming, and grassed waterways help prevent excessive soil loss. Residue management that provides protective cover on the surface helps maintain and improve fertility, reduces compaction and crusting, and aids in water infiltration.

Growing grasses and legumes for pasture and hay is an effective method of controlling erosion. Overgrazing, grazing when the soil is wet, or using equipment when the soil is wet results in surface compaction, excessive runoff, and poor tilth. Proper stocking rates and restricted use during wet periods help maintain the soil and pasture in good condition. Water for livestock is provided by small ponds.

This soil is well suited to trees, although only a small area is in woodland. There are only slight limitations for planting and harvesting trees.

This soil is suited to building site development and sanitary facilities. Sewage lagoons are feasible if located where slope is not a problem. Areas usually can be leveled for lagoon sites. Buildings should be designed to overcome the limitations of soil wetness and a high shrink-swell potential. This can be overcome with adequate reinforcement and tile drains around footings. For local streets and roads, a suitable base material should be added and adequate drainage with side ditches and culverts used to help prevent damage caused by low strength and shrinking and swelling of the soil.

The land capability classification is IVe. The woodland ordination symbol is 3o.

39—Pits, gravel. These are areas where the original soil and underlying gravel and sand have been removed by excavation. The depth of excavations usually ranges from about 6 to more than 50 feet. Slopes range from nearly level on the floor of the pit to nearly vertical on the walls. Mapped areas range from about 6 to more than 50 acres.

The original soils have been excavated, altered, or obscured to such a degree that identification and classification was not possible or practical.

The broad, nearly level floors of the pits consist of gravelly soil material. The walls of the pit expose stratified gravel and sand in the lower part and profiles of the surrounding soils in the upper part. Spoil piles ranging from 15 to 150 feet in diameter are on the soils near the rim of the excavation. Mixed in these spoil piles are gravel, sand, and materials of the excavated soils. Most of these excavations are in areas of Brandon, Loring, and Memphis soils.

Included with this unit in mapping and making up less than 5 percent of the unit are small undisturbed areas of Brandon, Loring, and Memphis soils.

Many areas are now inactive and idle, supporting vegetation such as trees, shrubs, herbs, and grasses. Some areas hold water.

Pits, gravel, are not given a land capability classification or woodland ordination symbol.

45—Canalou loamy sand. This is a nearly level, moderately well drained soil on convex natural levees. This soil is subject to rare flooding. Individual areas range from about 10 to 100 acres.

Typically, the surface layer is dark brown and very dark grayish brown loamy sand about 10 inches thick. The subsoil is very friable and about 40 inches thick. The upper part of the subsoil is dark brown, mottled loamy sand; the middle part is dark brown and brown, mottled sandy loam; and the lower part is dark yellowish brown, mottled loamy sand. The substratum is yellowish brown, mottled coarse sand to a depth of 60 inches or more. In some places the surface layer is sand.

Included with this soil in mapping are small areas of moderately well drained Farrenburg soils, somewhat poorly drained Lilbourn soils, and excessively drained Malden soils. The Farrenburg soils occur on similar positions and have an argillic horizon. The Lilbourn soils occur in lower areas and are somewhat poorly drained. The Malden soils occur on similar or slightly higher positions and do not have grayish mottles in the subsoil. These included soils make up about 1 to 15 percent of the unit.

Permeability of this Canalou soil is moderately rapid, and surface runoff is slow. The available water capacity is low, natural fertility is medium, and organic matter content is moderately low. The subsoil is strongly acid through slightly acid, but reaction in the surface layer ranges to neutral in places as a result of local liming and irrigation practices. The surface layer is very friable and easily tilled over a wide range of soil moisture. The seasonal high water table is at a depth of 2 to 3 feet during wet periods in winter and spring.

Most of this soil is used for cultivated row crops and small grains. A few areas are used for pasture and hay. This soil is suited to cotton, soybeans, wheat, corn, grain sorghum, truck crops, and forage crops. This soil is subject to soil blowing where it is unprotected. Most soil blowing damage is caused to young crops by bouncing sand grains. Soil blowing can be reduced by conservation cover crops, wind stripcrops, field windbreaks, and perennial grass barriers. Conserving crop residue will also help retard blowing, increase water intake, and increase fertility and tilth. This soil is somewhat droughty during hot, dry periods, but it responds well to irrigation. Many crops are irrigated, but pasture and hay crops are seldom irrigated.

Forage crops are effective in controlling soil blowing, improving soil structure, and helping to disrupt the life cycles of some pests of cultivated crops.

This soil is suited to trees. Seedling mortality rates are a management concern, but planting larger stock helps achieve better survival rates.

This soil generally is not suited to building site development and onsite waste disposal systems because of flooding.

The land capability classification is IIIs. The woodland ordination symbol is 3s.

51—Allemands muck. This is a nearly level, very poorly drained soil on low depressional areas in the former channels of the Mississippi River that remained swampy. It is subject to ponding and rare flooding. Natural vegetation was hydrophytic plants, grasses, and sedges. This map unit is one continuous area of more than 400 acres.

Typically, the surface layer is black muck about 5 inches thick. The subsurface layer is also black muck, about 20 inches thick. The substratum, to a depth of 64 inches, is stratified, very dark gray mucky silty clay in the upper part; very dark brown muck in the middle part; and dark gray mucky silty clay in the lower part. In some areas the black muck layers are less than 16 inches thick.

Included with this soil in mapping are areas of poorly drained, clayey Roellen soil in slightly higher positions. These inclusions make up about 5 percent of the unit.

Permeability of this Allemands soil is rapid in the upper organic material and very slow in the underlying clayey horizons. Reaction ranges from medium acid through moderately alkaline in the organic material and from neutral through moderately alkaline in the underlying mineral horizons. Natural fertility is high, and the organic matter content is very high. The seasonal high water table ranges from above the surface to 3 feet below the surface during wet periods. Root development is restricted to a depth of about 2 feet by the high water table.

All areas of this soil are used for cultivated crops or pasture. This soil is suited to corn, soybeans, and grasses for hay and pasture. Ditching is important to help remove ponded water. Lowering the water table requires the use of tile drains and water pumps. Corn and soybeans that require a short growing season are best suited because of difficulties in working the soil in spring. Pasture mixtures that consist of wetness-tolerant grasses, such as Reed canarygrass, will give best results for pasture and hay production.

This soil is not suited to building site development and onsite waste disposal because of the wetness and flooding.

The land capability subclass classification is IVw.

52—Kobel silty clay loam. This is a nearly level, poorly drained soil on broad slackwater flats and in slightly elongated concave areas. It is subject to occasional flooding. These areas are large and generally irregular in shape. They are about 6 to 500 acres or more.

Typically, the surface layer is very dark grayish brown silty clay loam about 3 inches thick. The subsurface layer is gray silty clay about 3 inches thick. The subsoil extends to a depth of about 66 inches or more. It is gray, mottled, very firm silty clay in the upper part; light gray, mottled, firm clay in the middle part; and gray, mottled, firm clay in the lower part. In some areas the subsoil has more clay.

Included with this soil in mapping are somewhat poorly drained Commerce soils and poorly drained Gideon and Mhoon soils. The Commerce soils have less clay and are higher in elevation on natural levees. The Gideon soils have more sand and less clay and are at similar elevations. The Mhoon soils have less clay and are at similar or slightly higher elevations. These inclusions make up about 5 to 15 percent of the unit.

Permeability of this Kobel soil is very slow, and surface runoff is slow or very slow. Available water capacity is moderate, and natural fertility is high. The organic matter content is moderate. The shrink-swell potential is very high. Reaction ranges from slightly acid to neutral in the subsoil. This soil is difficult to till and in low places usually remains wet for long periods in spring and winter. The water table perches near the surface to a depth of 1 foot during wet periods in winter and spring.

Most areas are used for cultivated crops. This soil is suited to soybeans, cotton, small grains, grain sorghum, and rice. Drainage is very important and field and lateral ditches can generally remove excess surface water. Land grading aids drainage, eliminates potholes, and provides a suitable grade for supplemental irrigation and rice growing. Incorporating crop residue into the surface layer and leaving a protective cover on the surface help improve infiltration and soil tilth.

This soil is suited to pasture grasses, but there is a hazard of compaction caused by grazing when the soil is wet. Controlled grazing, restricted use when the soil is wet, and rotation grazing help keep the pasture and soil in good condition.

This soil is suited to trees, and a few small areas remain in native woodland. Equipment limitations are a concern during wet periods. Equipment operations should be done during dry periods, or when the soil is frozen. Seedling mortality is likely. Ridging the soil and planting on the ridges helps increase seedling survival rates. Lighter, less intensive, and more frequent thinnings to reduce stand density may be necessary to minimize windthrow damage. Competing vegetation can be controlled by thorough site preparation, which may include spraying or cutting.

This soil generally is not suitable for building sites and sanitary facilities because of occasional flooding.

The land capability classification is IIIw. The woodland ordination symbol is 3w.

55—Amagon silt loam. This is a nearly level, poorly drained soil in former drainageways of delta streams and basins and in nearly level to slightly depressed areas of natural levees. It is subject to rare flooding. Individual areas of this soil are usually elongated and range from 6 to 1,000 acres or more.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil extends to a depth of 69 inches or more. It is light brownish gray, mottled, firm silty clay loam in the upper part; grayish brown silty clay loam in the middle part; and gray silt loam in the lower part. In some places a light gray subsurface layer is mixed in the upper part of the subsoil.

Included with this soil in mapping and making up to about 10 percent of the unit are poorly drained Forestdale soils and well drained Dubbs soil. The Dubbs soils are on old islands and small natural levees left by the former streams. The Forestdale soils have more clay and are in low depressions.

Permeability of this Amagon soil is slow, and surface runoff is slow or very slow. Reaction is strongly acid or very strongly acid in the surface, unless limed. Natural fertility is low, and organic matter content is low. Available water capacity is moderate to high. The friable surface layer has good tilth and is easily worked. It tends to puddle and crust after hard rains or if tilled when it is wet. The water table perches at a depth of 1 foot to 2 feet during wet periods in fall, winter, and spring.

Most areas are used for cultivated crops. If adequately drained, this soil is suited to most crops common to the county. Excess surface water can normally be removed by field and lateral ditches. Land grading helps eliminate potholes, improves surface drainage, and provides a plane for irrigation. Working crop residue into the soil improves fertility, reduces crusting and packing, and increases water absorption.

This soil is suited to trees, and a few small areas remain in native woodland. Equipment limitations are a concern during wet periods. Equipment operations should be timed for periods when the soil is dry or frozen. Seedling mortality, windthrow, and plant competition are management concerns. Ridging the soil and planting on the ridges will help achieve better survival rates. Lighter, less intensive, and more frequent thinnings to reduce stand density will minimize windthrow damage. Thorough site preparation will help overcome plant competition. This may include spraying or cutting.

This soil generally is not suitable for building site development and sanitary facilities because of flooding.

The land capability classification is IIIw. The woodland ordination symbol is 1w.

57B2—Bosket fine sandy loam, 1 to 5 percent slopes, eroded. This is a gently sloping, well drained soil on slightly convex slopes of broad, natural levees and terraces adjacent to braided channels of former streams. Some areas are along slightly concave drains. Mapped areas are irregular in shape and range from 10 to 100 acres or more in size.

Typically, the surface layer is dark brown and brown fine sandy loam about 9 inches thick. The subsoil is about 36 inches thick. The upper part of the subsoil is brown fine sandy loam; the middle part is brown, firm sandy clay loam; and the lower part is brown, firm fine sandy loam. The substratum, to a depth of about 66 inches, is brown, mottled fine sandy loam. Large areas have a lighter colored surface layer as a result of moderate erosion. In some areas the subsoil has more silt and less sand.

Included with this soil in mapping are small random areas of poorly drained Amagon soils. These inclusions make up 1 to 10 percent of the unit.

This Bosket soil has moderate permeability. Surface runoff is slow to medium, and the available water capacity is moderate. Organic matter content is moderately low, and the natural fertility is medium. Reaction ranges from strongly acid to slightly acid throughout the subsoil, but ranges to neutral in the surface and subsurface layer as a result of local liming and irrigation practices. The surface layer is friable and easily tilled over a wide range of soil moisture content.

Most of this soil is used for row crops, including specialty crops. It is suited to corn, soybeans, grain sorghum, winter wheat, and a few specialty crops such as cabbage (fig. 16), watermelons, cantaloupe, and strawberries.

Some areas of this soil are subject to water erosion, and the more sandy areas are subject to soil blowing. Cover crops, conservation tillage, wind stripcrops, field windbreaks, and perennial grass barriers help to overcome these hazards (fig. 17).

This soil is suitable for trees, and a few small areas remain in native woodland. Plant competition is moderate. Competing vegetation can be controlled by thorough site preparation, which may include spraying or cutting. This soil has no other hazards or limitations for planting and harvesting trees.

This soil is suitable for building sites, local roads and streets, and septic tank absorption fields. Seepage is a limitation for sewage lagoons. Excessive seepage can be prevented by sealing the bottom and berms of the lagoon with slowly permeable material.

The land capability classification is IIe. The woodland ordination symbol is 2o.

57C3—Bosket fine sandy loam, 5 to 9 percent slopes, severely eroded. This is a moderately sloping, well drained soil that is mostly on side slopes of high, broad natural levees of former braided streams of the ancestral Mississippi River. Individual areas range from 6 to more than 30 acres.

Typically, the surface layer, about 4 inches thick, is brown fine sandy loam. The subsoil is about 31 inches thick. The upper part of the subsoil is friable sandy clay loam, and the lower part is firm sandy clay loam and sandy clay. The substratum, to a depth of 60 inches or more, is yellowish brown fine sandy loam and fine sand. In some places, the surface layer is thicker and is very dark grayish brown fine sandy loam. In some places the subsoil has more silt and less sand.

Permeability is moderate, surface runoff is slow to medium, and available water capacity is moderate. Natural fertility and the organic matter content are low. The surface layer is strongly acid or slightly acid, but in some places it is neutral to mildly alkaline as a result of local liming practices. The surface layer is friable and easily tilled over a wide range of moisture. After hard rains, however, the surface has a tendency to puddle and crust.

Most areas of this soil are used for cultivated crops. It is suited to the commonly grown row crops, hay, pasture, and trees.

The major limitation to crop growth is the erosion hazard. Due to the shortness of the slopes, terraces are usually not practical, but no-till, conservation tillage, cover crops, grassed waterways, and residue management can help to prevent excessive water erosion and improve tilth. These same measures along with field windbreaks and perennial grass barriers can reduce damage from soil blowing.

Although only a small part of this unit is used for hay and pasture, these uses could be very effective in controlling excessive runoff and reducing erosion. Overgrazing or grazing when the soil is wet results in compaction, excessive runoff, and poor tilth. Proper

Figure 16.—Cabbage on Bosket fine sandy loam, 1 to 5 percent slopes, eroded.

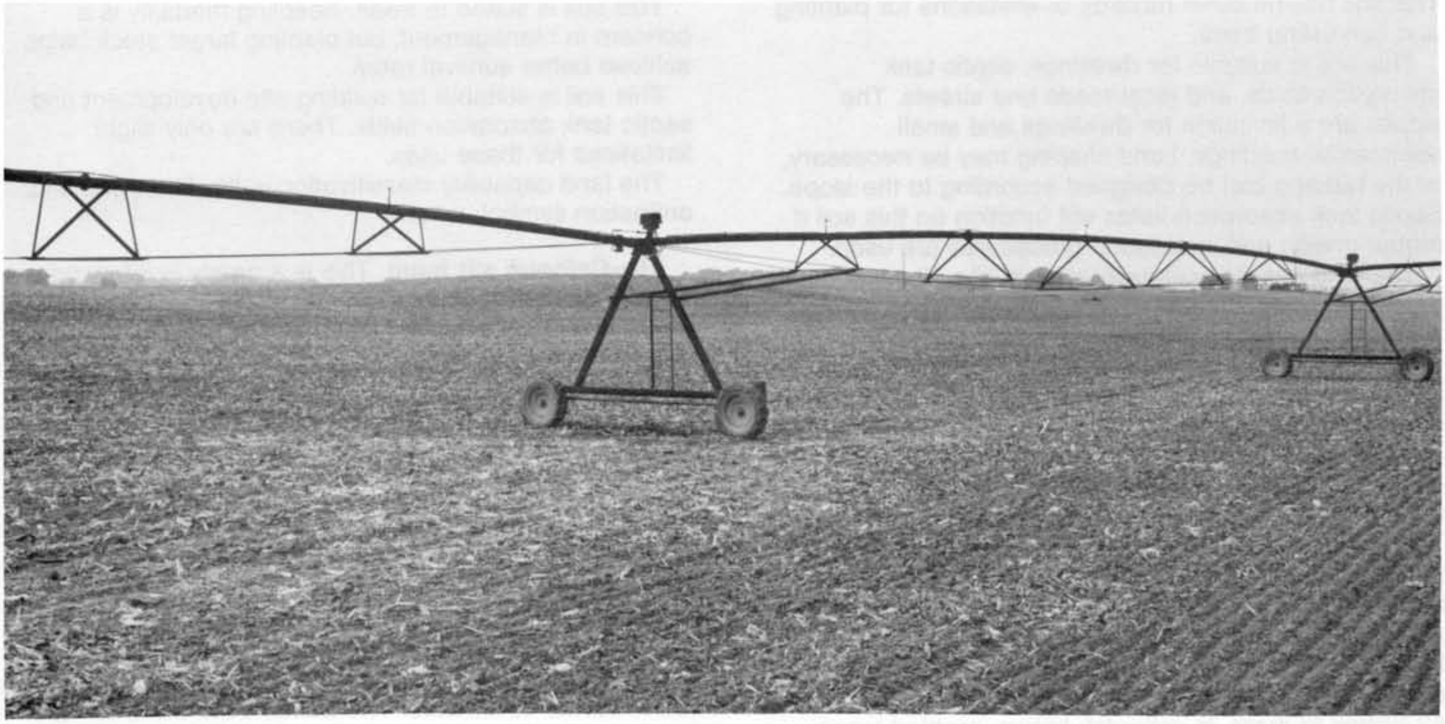

Figure 17.—Pivot irrigation system on Bosket fine sandy loam, 1 to 5 percent slopes, eroded.

stocking rates and pasture rotation are essential for good management.

This soil is suitable for trees. Plant competition is a management concern, but can be controlled by thorough site preparation. This may include spraying or cutting. This soil has no other hazards or limitations for planting and harvesting trees.

This soil is suitable for dwellings, septic tank absorption fields, and local roads and streets. The slopes limit small commercial buildings. Land shaping may be necessary, or the building can be designed according to the slope. Septic tank absorption fields will function on this soil if proper design and installation procedures are used.

The land capability classification is IIIe. The woodland ordination symbol is 2o.

57D3—Bosket fine sandy loam, 9 to 14 percent slopes, severely eroded. This is a strongly sloping, well drained soil on side slopes of high natural terraces of the ancestral Mississippi River. These areas are irregular in shape and range from 6 to 30 acres or more in size.

Typically, the surface layer is dark yellowish brown loamy fine sand to a depth of 9 inches. The subsoil is strong brown sandy clay loam and sandy loam to a depth of 36 inches. The substratum, to a depth of 60 inches or more, is strong brown loamy sand and sand. In some places the surface layer is darker, and in some places there is not as much clay in the subsoil. A few areas are moderately sloping.

Permeability of this soil is moderate, surface runoff is medium, and available water capacity is moderate. The natural fertility is low, and the organic matter content is low. The reaction of the surface soil is slightly acid to strongly acid, but in some places ranges to neutral as a result of local liming practices. The surface layer is friable and easily tilled over a wide range of moisture conditions, but after hard rains it has a tendency to puddle and crust.

Most areas of this soil are used for pasture and trees. This soil is not suited to cultivated crops because of the severe hazard of erosion.

The use of this soil for pasture and hay is an effective method of controlling erosion. Overgrazing or grazing while the soil is wet will cause surface compaction, excessive runoff, and poor tilth. Using equipment when the soil is wet has the same effect. Proper stocking rates and restricted use during wet periods are necessary to maintain the soil and pasture in good condition. Water for livestock is provided by ponds and drilled wells.

This soil is suitable for trees. Plant competition is a management concern, but can be controlled by thorough site preparation. This may include spraying or cutting.

This soil has no other hazards or limitations for planting and harvesting trees.

This soil is suitable for dwellings, septic tank absorption fields, and local roads and streets. The slopes are a limitation for dwellings and small commercial buildings. Land shaping may be necessary, or the building can be designed according to the slope. Septic tank absorption fields will function on this soil if proper design and installation procedures are used.

The land capability classification is VIe. The woodland ordination symbol is 2o.

59B—Broseley loamy fine sand, 1 to 5 percent slopes. This is a gently sloping, somewhat excessively drained soil on the higher parts of convex natural levees. Individual areas are commonly oblong in shape and oriented in a north-south direction. They range from 6 to 200 or more acres.

Typically, the surface layer is dark yellowish brown loamy fine sand about 8 inches thick. The subsurface layer is brown and dark yellowish brown loamy fine sand about 19 inches thick. The subsoil is about 23 inches thick. It is yellowish brown and dark yellowish brown, mottled fine sandy loam. The substratum, to a depth of 63 inches or more, is yellowish brown, mottled loose sand. In some areas the surface layer is fine sand.

Included with this soil in mapping are small areas of well drained Bosket soils, moderately well drained Farrenburg soils, and excessively drained Malden soils. The Bosket soils are on less sloping areas and are not as sandy in the surface and subsurface layers; the Farrenburg soils contain less sand in the surface and subsurface layers and are on less sloping, lower swales and saddles; and the Malden soils are sandier in the subsoil and are on side slopes and intermittent higher spots throughout the unit. These inclusions make up about 5 to 10 percent of the unit.

Permeability of this Broseley soil is moderately rapid, and surface runoff is slow. The available water capacity is moderate. Natural fertility is low to medium, and the content of organic matter is low. Reaction is strongly acid through slightly acid in the subsoil, but it can be mildly alkaline in the surface layer as a result of local liming and irrigation practices. The surface layer is very friable and easily tilled over a wide range of moisture conditions.

Most areas of this soil are used for cultivated crops, and a few areas are used for urban and residential sites. This soil is suited to corn, cotton, soybeans, small grain, and several truck crops. Water erosion is slight because most rainfall is usually absorbed by the soil. Soil blowing can be controlled by conservation tillage, cover crops, wind stripcrops, field windbreaks, and perennial grass barriers. Supplemental irrigation helps overcome the droughtiness hazard of this soil.

This soil is suited to trees. Seedling mortality is a concern in management, but planting larger stock helps achieve better survival rates.

This soil is suitable for building site development and septic tank absorption fields. There are only slight limitations for these uses.

The land capability classification is IIs. The woodland ordination symbol is 4s.

61—Calhoun silt loam. This is a nearly level, poorly drained soil on terraces of former flood plains. Individual areas of this soil usually are elongated and range from 6 to 1,000 acres or more.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsurface layer is light gray, mottled, friable silt loam about 11 inches thick. The subsoil extends to a depth of 65 inches or more. It is light brownish gray, mottled, firm silty clay loam. Pockets of silt loam subsurface material are intermixed with the subsoil. The subsurface layer is thinner in some places and less acid.

Included with this soil in mapping are small areas of somewhat poorly drained Crowley, well drained Dubbs, and poorly drained Foley soils. The Crowley soils are in lower basins of terraces. The Dubbs soils are on small knolls, mounds, or narrow ridges. The Foley soils are higher in the landscape and the subsoil is high in sodium content. These inclusions make up about 5 to 15 percent of the unit.

Permeability of this Calhoun soil is slow, and surface runoff is slow to very slow. Available water capacity is high. Natural fertility is low, and this soil responds well to lime and fertilizer. Organic matter content is low. Reaction typically is strongly acid to very strongly acid in the subsoil, but in places it ranges to neutral or mildly alkaline in the lower part. The reaction in the surface layer is medium acid through very strongly acid, but in places it is medium acid through mildly alkaline as a result of local liming and irrigation practices. The friable surface layer has good tilth and is easily worked. The surface layer tends to crust and puddle after hard rains or if tilled when it is wet. The water table perches near or within a foot of the surface during wet periods in winter and spring. A few areas are subject to temporary flooding from adjacent higher areas.

Most areas are used for cultivated crops (fig. 18). This soil is suited to most crops common to the county, but it tends to be wet. Excess surface water can be removed by a system of field and lateral ditches. Land grading helps to eliminate potholes, enhances surface drainage, and provides a surface suitable for supplemental furrow irrigation. Incorporating crop residue into the soil improves fertility, reduces crusting and compaction, and increases water infiltration rates.

This soil is suitable for trees, and a few small areas remain in native woodland. Equipment limitations are a concern during wet periods. Equipment operations

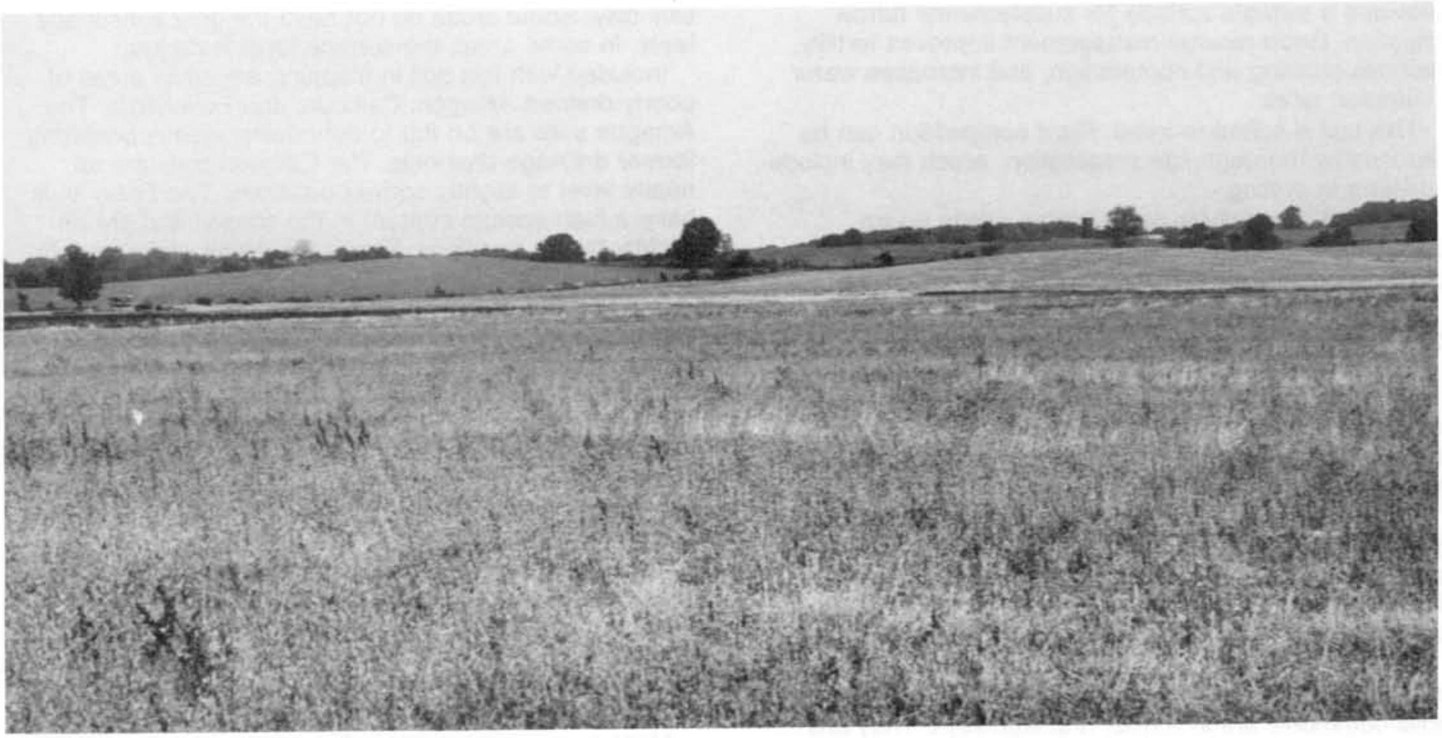

Figure 18.—Soybeans on Calhoun silt loam. Delta in foreground merges into uplands in background.

should be timed for periods when the soil is dry or frozen. Once established, seedlings grow well, but moderate mortality rates are likely. Ridging the soil and planting on the ridges helps increase seedling survival rates. Lighter, less intensive, and more frequent thinnings to reduce stand density may be necessary to minimize windthrow damage. Plant competition for seedlings can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and sanitary facilities because of the wetness.

The land capability classification is IIIw. The woodland ordination symbol is 3w.

63—Commerce silt loam. This is a nearly level, somewhat poorly drained soil on natural levees and flood plains of the braided stream system of a former river delta. These soils are subject to rare flooding. Individual areas are irregular in shape and range from 6 to more than 100 acres.

Typically, the surface layer is brown, friable silt loam about 11 inches thick. The subsoil, which extends to a depth of about 28 inches, is dark grayish brown and grayish brown, mottled silt loam. Below this is a buried subsoil about 21 inches thick. It is dark grayish brown, mottled silty clay loam in the upper part and dark gray, mottled silty clay in the lower part. Below this the substratum, to a depth of 68 inches or more, is gray, mottled silty clay.

Included with this soil in mapping are small areas of moderately well drained Canalou and Farrenburg soils and poorly drained Mhoon and Sharkey soils. The Canalou and Farrenburg soils are on higher positions in the landscape. The Mhoon soils are on slightly lower positions of the low natural levees. The Sharkey soils are in drainageways and backswamp basins. These included soils make up about 5 to 15 percent of the unit.

Permeability of this Commerce soil is moderately slow, and runoff from cultivated fields is medium to slow. The available water capacity is high. Natural fertility is medium, and the organic matter content is low. Reaction ranges from medium acid to moderately alkaline in the surface layer and subsoil and from neutral to moderately alkaline in the substratum. The high water table is at a depth of 1.5 to 4 feet during wet periods in winter and spring. The surface layer is friable and easily tilled over a moderate range in moisture conditions. It puddles and crusts after hard rains.

Most areas of this soil are cultivated. This soil is suited to corn, soybeans, cotton, grain sorghum, and wheat. Ditching and drainage are required in most areas of this soil to remove excess surface water. Land grading helps eliminate potholes, improves surface drainage, and provides a suitable surface for supplemental furrow irrigation. Good residue management improves fertility, reduces crusting and compaction, and increases water infiltration rates.

This soil is suited to trees. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to onsite waste disposal systems and building site development because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 1o.

64—Convent silt loam. This is a deep, nearly level, somewhat poorly drained soil on flood plains. It is subject to rare flooding. Individual areas are irregular in shape and range from 6 to 160 acres or more in size.

Typically, the surface layer is dark brown and dark grayish brown silt loam about 8 inches thick. The substratum extends to a depth of 66 inches or more. The upper part is grayish brown, mottled silt loam, and the lower part is light gray, mottled silt loam.

Included with this soil in mapping are a few areas of poorly drained Roellen and Sharkey soils. The Roellen soils commonly are in former drainageways. They are black, clayey soils higher in organic matter. The Sharkey soils are at lower elevations and have more clay. These inclusions make up about 1 to 15 percent of the unit.

Permeability of this Convent soil is moderate, available water capacity is moderate to high, natural fertility is medium, and the organic matter content is low. A high water table is at a depth of 1.5 to 4 feet during wet periods in winter and spring.

Most areas of this soil are cultivated. Very few areas are in pasture or woodland. It is suited to soybeans, corn, wheat, and grain sorghum. Excess surface water can be removed by a system of field and lateral ditches. Land grading helps to eliminate potholes, improves surface drainage, and provides a surface suitable for supplemental furrow irrigation.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 1o.

65—Crowley silt loam. This is a somewhat poorly drained, nearly level soil in slightly concave areas on terraces. Individual areas of this soil are broad and elongated and range from about 6 to 1,000 acres or more.

Typically, the surface layer is dark grayish brown, very friable silt loam about 4 inches thick. The subsurface layer is light gray, mottled silt loam about 5 inches thick. The subsoil extends to a depth of 72 inches or more. It is grayish brown and light brownish gray, mottled, firm silty clay. Some areas do not have the gray subsurface layer. In some areas the surface layer is darker.

Included with this soil in mapping are small areas of poorly drained Amagon, Calhoun, and Foley soils. The Amagon soils are on flat to concave positions bordering former drainage channels. The Calhoun soils are on nearly level to slightly convex positions. The Foley soils have a high sodium content in the subsoil and are on slightly higher positions. These inclusions make up 5 to 15 percent of the unit.

Permeability of this Crowley soil is very slow in the clayey subsoil, and surface runoff is slow. Available water capacity is moderate to high. The natural fertility is medium to low, and organic matter content is moderate. Reaction ranges from strongly acid to very strongly acid in the subsoil and from very strongly acid through neutral in the surface. This wide range of reaction is caused by local liming and irrigation practices. In places the lower part of the subsoil is neutral to moderately alkaline. The surface layer is very friable, has good tilth, and can be tilled over a fairly wide range of moisture content. It tends to puddle and crust after hard rains or if tilled when it is wet. The water table perches at a depth of 0.5 foot to 1.5 feet during wet periods in winter and spring. The shrink-swell potential is high.

Most areas are cultivated. Several areas are in pasture or woodland. This soil is suited to soybeans, wheat, grain sorghum, cotton, rice (fig. 19), irrigated corn, vegetables, and selected grasses and legumes for pasture and hay. Excess surface water can normally be removed by a system of field and lateral ditches, except where there are potholes. Land grading helps eliminate potholes, improves surface drainage, and provides a suitable grade for irrigation. Residue management that leaves large amounts of protective cover on the surface helps reduce surface crusting and improve fertility and water intake.

Areas used for pasture or hay generally are small. Pastures are easily compacted if grazed when the soil is wet. Grazing when the soil is wet also leads to poor tilth and a reduced stand of grasses. Proper stocking rates, timely delay of grazing, and deferment of hay cutting during wet periods help keep the pasture and soil in good condition. Plants that tolerate wetness should be grown.

This soil is suited to trees, and a few small areas remain in native woodland. Equipment limitations are a concern during wet periods. Harvesting should be done during dry periods or when the soil is frozen. Once seedlings are established, they grow well. A moderate seedling mortality rate is likely. Ridging the soil and planting on the ridges helps increase seedling survival rates. Lighter, less intensive, more frequent thinnings to reduce stand density may be necessary to reduce windthrow damage.

This soil is suited to building site development and some onsite waste disposal, but is limited for dwellings

Figure 19.—Rice on Crowley silt loam.

by wetness and a high shrink-swell potential. Areas for dwellings can be built up, and tile drains can be installed around foundations and footings to prevent damage from excessive wetness. Buildings and dwellings should be designed and constructed with additional steel reinforcement in concrete footings and foundations. Excavated areas should be backfilled with sand or gravel to prevent damage from shrinking and swelling of the soil. Sewage lagoons will function adequately. Roads and streets can be strengthened by adding a suitable base material to prevent damage caused by low strength. The shrink-swell potential and wetness are also limitations. Roadbeds can be constructed on raised, well-compacted material, or the water table can be lowered by providing adequate side ditches and culverts.

The land capability clasification is IIIw. The woodland ordination symbol is 3c.

67—Dundee loam. This is a nearly level, somewhat poorly drained soil in slightly concave drainageways, in depressions, and on toe slopes of natural levees. Individual areas vary in shape from broad and irregular to elongated and range in size from about 6 to 60 acres or more.

Typically, the surface layer is dark brown loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. It is grayish brown, mottled silty clay loam in the upper part and light brownish gray, mottled silty clay loam in the lower part. In areas where sand has been deposited by soil blowing, the surface layer is both thicker and sandier. In some narrow depressions the subsoil is clayey. In some areas there is a pale brown or light yellowish brown layer in the upper part of the subsoil. Some areas are gently sloping around the edge.

Included with this soil in mapping west of Crowley's Ridge are small areas of well drained Bosket and Dubbs soils, poorly drained Calhoun, and moderately well drained Loring soils. The Bosket and Dubbs soils are on slightly higher convex ridges and mounds. The Calhoun soils are in concave depressions and adjacent to toe slope edges of natural levees. The Loring soils are on the uplands adjacent to the Dundee soil on toe slopes. Included with this soil in mapping east of Crowley's Ridge are small areas of somewhat poorly drained Lilbourn and poorly drained Tuckerman soils. The Lilbourn and Tuckerman soils are on low natural levees or in drainageways. Lilbourn soils are sandier and Tuckerman soils are poorly drained. These inclusions make up 5 to 15 percent of the unit.

Permeability of this Dundee soil is moderately slow, and runoff is slow in depressions but medium on convex natural levees. Reaction in the subsoil is medium acid to very strongly acid, but ranges to neutral as a result of local liming and irrigation practices. Natural fertility is medium, and organic matter content is low. The available water capacity is high. The surface layer is friable and easily tilled over a fairly wide range of soil moisture, but it tends to puddle and crust following hard rains or if tilled when it is wet. The high water table is at a depth of about 1.5 to 3.5 feet during wet periods in winter and spring. A few areas are subject to local overflow, but many areas are covered for short periods with water that collects locally until it can drain into drainage ditches.

Most of this soil is used for continuous cultivation (fig. 20). Only a small acreage is used for pasture and hayland. This soil is suited to cotton, soybeans, wheat, corn, grain sorghum, and legumes and grasses for pasture and hay. Wetness is the main management factor on this soil. This wetness is a result of the soil's low position on the landscape and the collection of runoff from higher elevations. Most surface water can be removed by a system of surface ditches and land grading. Supplemental irrigation on graded fields greatly increases crop yields. Tilling this soil when it is wet destroys the tilth and results in compaction. Incorporating crop residue into the soil maintains fertility, organic matter content, and good tilth.

This soil is suitable for pasture and hayland. Overgrazing or grazing on this soil when it is wet causes compaction and poor tilth. Proper stocking rates and restricted use when this soil is wet are necessary to maintain the pasture and hayland in good condition.

This Dundee soil is suited to trees, but only a few areas still remain in woodland. Tree seedlings and cuttings survive and grow well if plant competition is controlled. This can be accomplished by site preparation, spraying, or girdling.

This soil generally is not suited to building site development and onsite waste disposal systems because of the wetness. If dwellings are constructed on this soil, they should be on raised, well-compacted fill material. Sewage should be piped to adjacent areas with soils more suitable for waste disposal.

The land capability classification is IIw. The woodland ordination symbol is 2o.

68—Waverly silt loam. This is a nearly level, poorly drained soil on flood plains parallel to streams and drainage channels. It is subject to occasional flooding.

Figure 20.—Wheat stubble on Dundee loam. Soybeans will be planted here next.

Areas of this soil are irregular in shape and range from about 6 to 200 acres or more in size.

Typically, the surface layer is grayish brown silt loam about 8 inches thick. The subsoil, about 36 inches thick, is light gray and light brownish gray, mottled silt loam. The substratum, to a depth of 63 inches or more, is light gray, mottled silt loam. In some areas, some subsoil layers have more clay. In some areas the subsoil is browner.

Included with this soil in mapping are small areas of poorly drained Calhoun and Zachary soils. The Calhoun and Zachary soils have more clay in the subsoil. These inclusions make up about 2 to 15 percent of the unit.

Permeability of this Waverly soil is moderate, and the surface runoff is slow. Natural fertility is medium, available water capacity is high, and organic matter content is moderate. Reaction in the surface layer ranges to neutral in places, depending on local liming practices. Below the surface layer the soil is strongly acid or very strongly acid. The high water table is at a depth of .5 foot to 1 foot during wet periods in winter and spring. The surface layer is friable and easily tilled. It tends to puddle and crust after hard rains.

Most areas of this soil are used for cultivated crops. This soil is suited to soybeans, wheat, corn, and grain sorghum and to grasses and legumes for hay and pasture. Stands of winter annual and perennial plants are reduced some years by excessive wetness in winter and spring. Wetness tends to be the major problem. A system of field ditches can generally remove excess surface water. Land grading improves drainage, eliminates potholes, and provides suitable grade for supplemental irrigation. Managing crop residue reduces crusting, improves fertility, and maintains organic matter content.

Only a very small acreage of this soil is used for hay and pasture. Overgrazing and working the soil or grazing when the soil is wet causes surface compaction and poor tilth. Good management includes proper stocking rates and restricted use during wet periods.

This soil is suited to trees, but very few areas are still in native hardwoods. Equipment limitations are a concern during wet periods. Equipment operations should be timed for periods when the soil is dry or frozen. Seedling mortality, windthrow, and plant competition are management concerns. Ridging the soil and planting on the ridges will help achieve better survival rates. Lighter, less intensive, and more frequent thinnings to reduce stand density will minimize windthrow damage. Thorough site preparation will help overcome plant competition. This may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding and wetness.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

69—Falaya silt loam. This is a nearly level, somewhat poorly drained soil on broad flat areas of present and former flood plains. It is subject to occasional flooding. Individual areas of this unit usually are elongated and parallel to major streams. Areas range from about 6 acres to more than 500 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The substratum, to a depth of about 32 inches, is brown, mottled; mottled gray and brown; light gray, mottled; and pale brown, mottled friable silt loam. Below this is light gray and dark yellowish brown, mottled, brittle silt loam about 22 inches thick. Below this is a buried subsoil, to a depth of 75 inches or more, that is pale brown, mottled, friable silt loam.

Included with this soil in mapping are small areas of moderately well drained Collins soils and poorly drained Zachary soils. The Collins soils occupy the narrow upstream parts of the stream bottoms and the slightly higher convex natural levees. The Zachary soils occupy the same local positions as the Falaya soil on the broad, flat flood plains. Also included are some frequently flooded areas of Falaya soils between the levee and stream channel. These soils make up about 5 to 15 percent of the unit.

Permeability of this Falaya soil is moderate, and surface runoff is slow. Natural fertility is medium, organic content is low, and available water capacity is high. The high water table is at a depth of 1 foot to 2 feet during wet periods in winter and spring. The surface layer is very friable and easily tilled over a fairly wide range of moisture content. The surface tends to puddle and crust after hard rains.

Most areas of this soil are used for cultivated crops. A few areas are used for pasture and hay. This soil is suited to soybeans, wheat, cotton, corn, rice, grain sorghum, and grasses and legumes for hay and pasture. Stands of winter annual and perennial plants may be reduced in some areas by excessive wetness in winter and spring. The wetness of this soil is partly the result of runoff from local areas and the seasonally high water table. A system of field ditches will remove excess surface water. Land grading improves drainage, eliminates potholes, and provides a surface plane for the application of supplemental irrigation water. Incorporating crop residue into the surface layer retards crusting, improves fertility, and maintains organic matter content and good tilth. Diversions or terraces are helpful in diverting runoff from the upland areas. Areas between major streams and waterways and their levees are subject to frequent overflow during rainy seasons.

This soil is suited to grasses and legumes for hay and pasture. A system of field ditches can usually remove excess surface water into major drainage ditches. Overgrazing, working the soil when it is wet, or grazing when the soil is wet causes surface compaction and poor tilth. Proper stocking rates and restricted use during wet periods are good management practices.

This soil is suited to trees, and a few areas remain in native hardwoods. Many of the frequently flooded areas between levees and adjacent to streams are in woodland. Tree cuttings and seedlings survive and grow well if plant competition is controlled. This can be accomplished by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite sewage disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 1o.

71—Gideon loam. This is a nearly level, poorly drained soil in low depressions and in drains on low natural levees. This soil is subject to occasional flooding. Areas generally are elongated and oriented in a southwesterly direction.

Typically, the surface layer is very dark grayish brown loam about 7 inches thick. The substratum, to a depth of about 63 inches or more, is gray, mottled sandy clay loam in the upper part; light gray, mottled clay loam in the middle part; and light gray, mottled sandy clay loam in the lower part. In some places, there is less clay in the upper part of the subsoil.

Included with this soil in mapping are areas of poorly drained Sharkey soils. The Sharkey soils are in lower positions and contain more clay. These soils make up about 1 to 10 percent of the unit.

Permeability of this Gideon soil is moderately slow, and runoff is slow. Fertility is high, organic matter content is moderately low, and available water capacity is high. Reaction is slightly acid to mildly alkaline. A seasonal high water table is near the surface to a foot below the surface during wet periods in winter and spring. The surface layer is friable and easily tilled, but if tilled when it is wet it tends to puddle and crust.

Most of this soil is used for cultivated crops. It is suited to soybeans, rice, cotton, corn, grain sorghum, wheat, and other small grain. A few areas are in pastures and trees. Stands of wheat and other winter annual plants often are reduced by drowning in low areas. Wetness is the main management concern, but land grading or a system of field ditches can generally remove excess surface water. In addition, proper land grading provides a suitable grade for supplemental irrigation. A plowpan commonly forms where this soil is plowed wet or is plowed consistently at the same depth. Managing crop residue to provide a protective cover and incorporating the remainder into the soil helps reduce crusting, improve fertility, maintain organic matter content, reduce wind erosion, and increase water infiltration.

Only a small acreage of this soil is used for pasture or hay. Areas used for pasture compact when overgrazed or grazed when they are wet. Proper stocking rates, pasture rotation, and restricted use when the soil is wet are good management practices.

This soil is suited to trees, but only a few areas remain in native hardwoods. Seedling mortality, windthrow, and plant competition are concerns in management. Ridging the soil and planting on the ridges helps increase seedling survival. Lighter, but more frequent, thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 2w.

73—Lilbourn fine sandy loam. This is a nearly level, somewhat poorly drained soil on natural levees and low terraces and along slightly concave drainageways. This soil is subject to rare flooding. Some of it is protected by levees but may be flooded if a levee breaks or runoff is received from adjacent areas. Individual areas are irregular in shape and range from 6 acres to several hundred acres in size.

Typically, the surface layer is brown, very friable fine sandy loam about 5 inches thick. The subsurface layer is also brown, friable fine sandy loam about 8 inches thick. Next is a substratum layer of light brownish gray, mottled, friable fine sandy loam underlain by a buried subsoil layer about 17 inches thick of light brownish gray, mottled, friable loam. Below this the substratum, to a depth of 61 inches or more, is light brownish gray, mottled loam and grayish brown, mottled sandy loam.

Included with this soil in mapping are small areas of moderately well drained Canalou soils, somewhat poorly drained Dundee soils, and poorly drained Gideon soils. The Canalou soils are higher on the landscape. The Dundee and Gideon soils occupy similar positions on the landscape but contain more clay. These inclusions make up about 1 to 15 percent of the unit.

Permeability of this Lilbourn soil is moderate, and surface runoff is slow. Available water capacity is moderate, and organic matter content is low. Natural fertility is low to medium. The high water table is near the surface to a depth of 2 feet during wet periods in winter and spring. Reaction ranges from medium acid to neutral in the surface layer and strongly acid to neutral in the substratum. The surface layer is friable and easily tilled over a fairly wide range in moisture content.

Most areas of this soil are used for cultivated crops. A few areas are in pasture. It is suited to soybeans, grain sorghum, corn, cotton, and wheat. Stands of small grain and other cool-season crops are subject to reduction by wetness. Wetness is the major limitation for most uses. A system of drainage ditches or land grading will help eliminate excess surface water. Some crop residue should be kept on the surface and the remainder mixed into the soil to help maintain good tilth and the organic matter content. This also helps control soil blowing during winter and spring.

If this soil is used for pasture, overgrazing and grazing when the soil is wet causes surface compaction and poor tilth. Pasture rotation, proper stocking, restricted use during wet periods, and suitable wetness-tolerant plants help maintain the pasture and soil in good condition.

This soil is suited to trees, but very few areas are in woodland (fig. 21). This soil has no hazards or limitations for planting and harvesting trees.

This soil generally is not suited to building site development and onsite waste disposal because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 3o.

74B—Malden sand, 0 to 4 percent slopes. This is a nearly level and gently sloping, excessively drained soil on broad sandy natural levees. Areas are somewhat irregular in shape and usually oriented in a north-south direction. Individual areas range from 6 to 100 acres or more.

Typically, the surface layer is dark yellowish brown sand about 9 inches thick. The subsoil is dark brown or yellowish brown sand about 19 inches thick. The substratum, to a depth of 64 inches or more, is brownish yellow or very pale brown gravelly sand or very gravelly sand.

Included with this soil in mapping are small areas of Canalou and Lilbourn soils. The Canalou soils are moderately well drained and are usually on convex ridges abutting braided stream channels. The Lilbourn soils are somewhat poorly drained and are at the same elevations. These inclusions make up to about 10 percent of the unit.

Permeability of this Malden soil is rapid, and surface runoff is slow. Available water capacity, natural fertility, and organic matter content are low. Reaction ranges from strongly acid to medium acid. The surface layer is very friable and tends to be loose when dry. The surface is subject to soil blowing if not protected.

Some areas of this soil are used for cultivated crops. Most areas are in pasture, hay, and trees. This soil is suited to cotton, soybeans, corn, peas, grain sorghum, and small grains as well as grasses and legumes for hay or pasture. Clean-tilled crops can be damaged by blowing sand, unless protected, and by drought during prolonged dry periods. Use of conservation tillage, winter cover crops, wind stripcrops, perennial grass barriers, and field windbreaks are practices that reduce damage caused by soil blowing.

The use of this soil for improved pasture or hay meadows is very effective for controlling soil blowing.

Figure 21.—Farm woodlot on Lilbourn fine sandy loam. Most of the delta once supported such vigorous timber.

This soil tends to be droughty during extended dry periods. Many areas are in the native grasses or the grasses and weeds common to idle land.

This soil is suited to trees, but a few areas remain in woodland. Seedling mortality and plant competition are concerns in management. Planting larger or container-grown stock helps achieve better survival rates. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suitable for building site development but is too sandy for safe onsite waste disposal. Lagoons could be used if bottoms and berms are permanently sealed with a slowly permeable or artificial material.

The land capability classification is IIIs. The woodland ordination symbol is 3s.

75B—Malden loamy sand, 0 to 4 percent slopes. This is a nearly level and gently sloping, excessively drained soil on broad, convex, natural levees. Individual areas are somewhat irregular in shape and generally oriented in a north-south direction. These areas range from 6 acres to several hundred acres.

Typically, the surface layer is dark brown, very friable loamy sand about 7 inches thick. The subsurface layer is dark yellowish brown, friable loamy sand about 7 inches thick. The subsoil, about 38 inches thick, is dark brown, strong brown, and dark yellowish brown, friable loamy sand. The substratum, to a depth of 70 inches or more, is dark yellowish brown, very friable sand.

Included with this soil in mapping are small areas of well drained Broseley soils on narrow ridgetops. These inclusions make up to about 10 percent of the unit.

Permeability of this Malden soil is rapid, and surface runoff is slow. Available water capacity is low, and organic matter content is low or moderately low. Natural fertility is low or medium, and this soil responds well to lime and fertilizer. Reaction ranges from strongly acid through slightly acid, but the reaction in the surface layer is neutral in some places as a result of local liming practices. The surface layer is very friable and tends to be loose when dry. It is easily tilled over a wide range of moisture conditions. The surface is subject to soil blowing if not protected.

Most areas of this soil are used for cultivated crops. Some areas are used for specialty crops. This soil is suited to cotton, soybeans, corn, peas, grain sorghum, small grain, grasses and legumes for pasture and hay, watermelons, cantaloupes, cabbage, and other specialty crops. When used for clean-tilled crops there is a hazard of damage by soil blowing. Most damage is done to young tender plants by the moving sand particles. Use of conservation tillage, winter cover crops, wind stripcrops, perennial grass barriers, and field windbreaks are practices that curb soil loss or damage. This soil tends to be droughty during extended dry periods, and areas that have been graded should have supplemental irrigation during these stressful periods. Some areas receive supplemental irrigation by overhead sprinkler systems. Most of the corn grown on this soil is irrigated. Residue management that provides surface protection from the wind retards soil movement and adds to soil fertility.

A small acreage of this soil is used for pasture and hay. These uses are very effective at controlling soil blowing. Overgrazing or grazing during extended dry periods often results in reduction of the plant cover and a loss of the stand. Proper stocking rates, pasture rotation, timely deferment of grazing, and use of supplemental irrigation are necessary to keep the pasture in good condition.

The soil is suited to trees, but few areas remain in woodland. Seedling mortality and plant competition are concerns in management. Planting larger or container-grown stock helps achieve better survival rates. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suitable for building site development but is too sandy for safe onsite waste disposal. Lagoons could be used if bottoms and berms are permanently sealed with a slowly permeable or artificial material.

The land capability classification is IIIs. The woodland ordination symbol is 3s.

76—Mhoon silt loam. This nearly level, poorly drained soil is along low drainageways and depressions of the flood plains. This soil is subject to occasional flooding. It is protected by a drainage system maintained by drainage districts. Mapped areas range from long and irregular bands to broad, wide areas. They are 6 to 200 acres or more.

Typically, the surface layer is dark grayish brown and dark brown silt loam about 11 inches thick. The subsoil, about 45 inches thick, is light gray, mottled silt loam in the upper part and light gray, mottled silty clay loam in the lower part. The substratum, to a depth of 72 inches or more, is light gray, mottled silty clay loam and light gray and light brownish gray, mottled silt loam.

Included with this soil in mapping are somewhat poorly drained Commerce soils and poorly drained Roellen and Sharkey soils. The Commerce soils occupy the slightly higher areas, and the Roellen and Sharkey soils are on slightly lower positions. The Roellen soils have a thick, black surface layer, and the Sharkey soils have much more clay throughout. These inclusions make up to about 15 percent of the unit.

This Mhoon soil is slowly permeable and has a high available water capacity. Surface runoff is slow. Organic matter content is low, and natural fertility is high. Reaction in the subsoil ranges from slightly acid to mildly alkaline.

Nearly all areas of this soil are used for cultivated crops. This soil is suited to soybeans, corn, small grain, grain sorghum, and grasses and legumes for hay or pasture. Surface drainage is accomplished by land grading and field ditching. Tillage generally is not a problem but should be delayed in spring until the soil is dry. Returning crop residue to the soil helps to maintain fertility and improve water infiltration and tilth.

This soil is suited to trees, and a few areas remain in woodland. Equipment limitation, seedling mortality, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Planting larger stock than usual will help achieve better survival rates. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 1w.

77—Roellen silty clay loam. This is a nearly level, poorly drained soil in concave natural drains, channels, and basins on flood plains. It is subject to occasional flooding. Individual areas usually are long and narrow or broad and irregularly shaped. They range from 6 to 300 acres or more.

Typically, the surface layer is black silty clay loam about 3 inches thick. The subsurface layer is black silty clay about 9 inches thick. The subsoil, about 26 inches thick, is dark gray and light olive gray, mottled firm silty clay and clay. The substratum, to a depth of 61 inches or more, is greenish gray, mottled clay loam and silty clay loam. Some areas have thin layers that consist mostly of iron and manganese concretions as much as 1/2 inch in diameter. In some places the dark surface layer is less than 10 inches thick. A thin loamy surface layer or organic layer occurs in small areas. Loamy substrata are below the subsoil in a few areas.

Included with this soil in mapping are small areas of Allemands and Lilbourn soils. The Allemands soils, which are in the lowest position, are of organic material. The Lilbourn soils are sandy and usually are on broader, higher natural levees. These included soils make up about 10 to 15 percent of the unit.

Permeability of this Roellen soil is slow, and surface runoff is slow. The available water capacity is moderate. The organic matter content and natural fertility are high. Reaction in the subsoil is medium acid through mildly alkaline, but the reaction in the surface layer varies and is commonly neutral as a result of local liming practices. The shrink-swell potential is high. A high water table is within a foot of the surface during wet periods. The surface layer is firm and tills easily only within a narrow moisture range. When wet the surface layer is sticky and difficult to till; when dry it is hard and works up cloddy. Tillage should be done far enough in advance to allow freezing and thawing and alternate wetting and drying to break up the clods.

Most areas of this soil are used for row crops. This soil is suited to corn, soybeans, grain sorghum, rice, cotton, wheat, and grasses and legumes for pasture and hay where surface drainage can be installed. Excess surface water can usually be removed by a system of field ditches. Land grading improves drainage, fills potholes, and provides a plane for supplemental irrigation. Incorporating crop residue into the surface layer helps improve fertility and tilth.

The use of this soil for pasture or hay is limited to small areas because most of the acreage is cultivated. Stands of grasses and legumes usually are reduced each winter and spring by wetness. Wetness-tolerant species should be favored in selections. Overgrazing or grazing when the soil is wet causes compaction, puddling, and crusting of the surface layer. Proper stocking rates and restricted use during wet periods are necessary to maintain the pasture and soil in good condition.

This soil is suited to trees, but only a few areas remain in woodland. Equipment limitation, seedling mortality, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Planting larger stock than usual will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

80—Sharkey silty clay loam. This is a nearly level, poorly drained soil in old stream channels and broad depressional areas of flood plains. It is subject to occasional flooding. Individual areas are large and usually elongated. They range from about 10 to more than 2,000 acres.

Typically, the surface layer is dark grayish brown, firm silty clay loam about 6 inches thick. The subsurface layer is dark grayish brown, firm clay about 4 inches thick. The subsoil, about 46 inches thick, is gray, mottled, firm clay. The substratum, to a depth of 72 inches or more, is gray, mottled, firm clay.

Included with this soil in mapping are small areas of poorly drained Gideon loam and Sharkey clay. The Gideon soil has less clay and occurs on slightly higher swells. The Sharkey clay occurs in lower depressions or drainageways. These inclusions make up to about 10 percent of the unit.

Permeability of this Sharkey soil is very slow, and surface runoff is slow or very slow. Available water capacity is moderate, organic matter content is moderately low, and natural fertility is medium. The shrink-swell potential is high, although the surface layer has a moderate shrink-swell potential. Reaction ranges from medium acid through moderately alkaline in the subsoil and varies widely in the surface layer as a result of local liming and irrigation practices. The high water table is within 2 feet of the surface during wet periods in winter and spring. The soil is difficult to till and in low places remains wet for long periods during spring and winter.

Most areas of this soil are used for cultivated crops. A few areas are used for pasture or trees. Where this soil has adequate surface drainage, it is suited to soybeans, grain sorghums, cotton, corn, small grain, rice, and grasses. A system of field ditches can usually remove excess surface water. Land grading improves drainage, eliminates potholes, decreases seedling mortality rates, and provides a plane for irrigation. Incorporating crop residue into the surface layer improves the tilth of this soil.

A small acreage of this soil is in pasture grasses. During wet periods there is a hazard of plant damage and compaction of the surface layer by livestock. Controlled grazing, restricted use during wet periods, and rotation grazing will help keep the soil and pasture in good condition.

This soil is suited to trees, and a few areas remain in native hardwoods. Equipment limitation, seedling mortality, windthrow, and plant competition are concerns in management. Equipment operations should be timed for when the soil is dry or frozen. Planting larger stock than usual will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 3w.

81—Sharkey silty clay. This nearly level, poorly drained soil is in narrow, former stream channels or in broad depressions or basins of flood plains. It is subject to occasional flooding. Individual areas are usually elongated and somewhat irregular in shape. They range from about 10 to 400 acres or more.

Typically, the surface layer is dark grayish brown silty clay about 4 inches thick. The subsoil, to a depth of 70 inches or more, is gray, mottled, firm clay.

Included with this soil in mapping are small areas of poorly drained Sharkey silty clay loam. These areas are adjacent to the soil boundary on low swells. They make up to about 10 percent of the unit.

Permeability of this Sharkey soil is very slow, and surface runoff is slow or very slow. Available water capacity is moderate, organic matter content is moderately low, and natural fertility is medium. The shrink-swell potential is high. Reaction ranges from medium acid through moderately alkaline in the subsoil and surface layers. The high water table is within 2 feet of the surface during wet periods in winter and spring. This soil can be satisfactorily tilled only in a narrow range of moisture conditions.

Most areas of this soil are used for cultivated crops. Where drained, this soil is suited to soybeans, cotton, small grain, rice, and grasses. A system of field ditches usually can remove excess surface water. Land grading improves drainage, fills potholes, and provides a plane for supplemental irrigation. Using conservation tillage to incorporate crop residue into the surface layer will improve tilth and increase water infiltration.

A small acreage of this soil is used for pasture. During wet periods there is a hazard of plant damage and compaction of the surface layer if the pasture is grazed by livestock. Controlled grazing and restricted use during wet periods are good management practices.

This soil is suited to trees, and a few areas remain in native hardwoods. Equipment limitation, seedling mortality, windthrow, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Planting larger stock than usual will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of flooding.

The land capability classification is IVw. The woodland ordination symbol is 3w.

83—Sikeston loam. This is a nearly level, poorly drained soil in depressional areas and old channels of flood plains. It is subject to occasional flooding. It is protected by drainage ditches but collects water from adjacent areas. Individual areas are irregular in shape and range from 6 to 100 acres or more in size.

Typically, the surface layer is very dark grayish brown loam about 4 inches thick. The subsurface layer extends to a depth of about 27 inches. The upper part is very dark gray loam, and the lower part is very dark gray clay loam. Below this is a transitional layer of dark gray, mottled clay loam about 11 inches thick. The substratum extends to a depth of 60 inches or more. It is dark gray, mottled loam.

Included with this soil in mapping are small areas of Bosket, Gideon, and Mhoon soils. The Bosket soils are well drained and are higher. The Gideon soils have more clay and are slightly higher. The Mhoon soils have less sand and are at about the same elevations. These inclusions make up about 10 to 15 percent of the unit.

This Sikeston soil has moderately slow permeability. Surface runoff is slow or very slow. Available water capacity and natural fertility are high. Organic matter content is moderate. Reaction ranges from slightly acid to mildly alkaline throughout the soil. The water table perches near the surface to a depth of 1.5 feet during wet periods in winter and spring. The surface layer is friable and easily tilled, but if tilled when it is wet, it becomes cloddy and compact and tends to form a traffic pan.

Most areas of this soil are used for cultivated crops. Soybeans, corn, wheat, grain sorghum, cotton, pasture, and hay are grown in the drained areas. The wetness generally reduces stands of winter wheat in areas that are not drained. A system of field ditches and land grading will remove excess water and provide a plane for supplemental irrigation. Keeping a protective cover of crop residue on the surface and mixing the remainder into the surface layer helps maintain organic matter content and soil tilth.

This soil is suited to trees, and a few areas remain in native hardwoods. Equipment limitation, seedling mortality, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Planting larger than usual stock will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

85—Wardell loam. This is a nearly level, poorly drained soil in concave drainageways or slightly elevated low natural levees. It is subject to rare flooding. Individual areas commonly are elongated and range in size from about 6 to 200 acres or more. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown and very dark brown loam about 9 inches thick. The subsoil is about 39 inches thick. It is light brownish gray and light gray, mottled loam in the upper part and light gray, mottled, firm clay loam in the lower part. The substratum is light gray, mottled, clay loam and sandy loam to a depth of 62 inches or more.

Included with this soil in mapping are small areas of poorly drained Gideon soils and somewhat poorly drained Lilbourn soils. The Gideon soils are nonacid and are at slightly lower elevations. The Lilbourn soils are nonacid and are on low knolls and low terrace remnants. These inclusions make up 5 to 15 percent of the unit.

Permeability and surface runoff of this Wardell soil are slow. Available water capacity is high. Natural fertility is medium. Organic matter content is moderately low. Reaction in the subsoil ranges from very strongly acid to slightly acid. It ranges to neutral in the surface layer as a result of local liming practices. The water table perches to within 1.5 feet of the surface during wet periods. The surface layer is friable and easily tilled, but will puddle and crust after hard rains if unprotected.

Most areas of this soil are used for cultivated crops. This soil is suited to soybeans, corn, cotton, wheat, grain sorghums, rice, and grasses and legumes for hay and pasture. Wetness is the main management concern. Excess surface water generally can be removed by field ditches. Land grading not only improves the lay of the land but eliminates potholes and provides a uniform grade for supplemental irrigation. Mixing crop residue into the surface layer and leaving some on top of the surface helps maintain organic matter content and reduce crusting. If tilled when wet, this soil forms a traffic pan.

This soil is suited to trees, but only a few areas remain in native hardwoods. Equipment limitation, seedling mortality, windthrow, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Planting larger than usual stock will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 3w.

87B—Dubbs silt loam, 1 to 5 percent slopes. This is a gently sloping, well drained soil on natural levees and terraces. It commonly is on slightly convex areas, but also occurs along the sides of narrow, slightly concave natural drains of former braided streams. Individual areas usually are oblong with a north-south trend and range in size from 6 to 80 acres or more.

Typically, the surface layer is brown, very friable silt loam about 6 inches thick. The subsoil extends to a depth of about 60 inches or more. The upper part is brown and dark brown, friable silt loam; the middle part is dark brown silty clay loam; and the lower part is dark brown silt loam. A few small areas have a very dark grayish brown surface layer, and a few other small areas on the steeper side slopes have a severely eroded surface layer that is brown silty clay loam.

Included with this soil in mapping are small areas of Bosket soils that contain more sand than the Dubbs soil and are on higher areas. These inclusions make up about 5 percent of the unit.

Permeability of this Dubbs soil is moderate. Surface runoff is slow to medium. Organic matter content is low, and natural fertility is medium. Reaction ranges from strongly acid through medium acid in the subsoil, but it is as much as neutral in the surface layer as a result of local liming or irrigation practices. The surface layer is friable and easily tilled over a wide range of moisture content. It tends to puddle and crust after hard rains.

Nearly all areas of this soil are used for cultivated crops. This soil is suited to corn, soybeans, wheat, cotton, grain sorghum, and grasses and legumes for pasture and hay. A slight erosion hazard is the only concern for use of this soil for cropland. Conservation tillage and incorporating crop residue into the soil helps reduce runoff, maintain fertility, increase water intake, and reduce surface crusting.

Only small areas of this soil are used for pasture and hay. Rotation grazing and restricted grazing during wet periods are necessary to maintain the pasture and soil in good condition.

This soil is suited to trees. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suitable for building site development and onsite waste disposal. Where lagoons are installed, it is necessary to seal the bottoms and berms to prevent seepage.

The land capability classification is IIe. The woodland ordination symbol is 2o.

89—Foley silt loam. This is a nearly level, poorly drained soil on broad tops of terraces. This soil has a high content of sodium or sodium and magnesium, which suppresses plant growth. Areas are somewhat elongated and are about 6 to 40 acres or more.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is grayish brown, friable silt loam about 3 inches thick. The subsoil extends to a depth of 78 inches or more. It is grayish brown, friable silt loam and gray, mottled firm silty clay loam in the upper part and light olive gray, gray, and yellowish brown, mottled, firm silt loam in the lower part.

Included with this soil in mapping are small areas of somewhat poorly drained soils, at slightly higher elevations, that are higher in content of sodium. These inclusions make up about 10 percent of the unit.

Permeability of this Foley soil is very slow, and surface runoff is slow. Available water capacity is low to moderate. Organic matter content is low, and natural fertility is low. The soil responds well to lime and fertilizer. Reaction is alkaline in the subsoil and medium acid to very strongly acid in the surface and subsurface layers. Many areas may range to neutral as a result of local liming and irrigation practices. The water table perches to within a foot of the surface during wet periods in winter and spring. The surface layer is friable and easily tilled, but tends to puddle and crust after hard rains and if tilled when it is wet. Root development is restricted by the layers high in sodium.

Nearly all areas of this soil are used for cultivated crops. This soil is suited to rice, and under irrigation corn, grain sorghum, and soybeans do well.

This soil is suited to some trees, and a few small areas remain in native post oak. Equipment limitations are a concern during wet periods. Equipment operations should be timed for periods when the soil is dry or frozen. Once established, seedlings will grow, but seedling mortality is likely. Ridging the soil and planting on the ridges helps increase seedling survival. Lighter, less intensive, and more frequent thinnings to reduce stand density will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suited to building site development and onsite waste disposal but is severely limited by wetness. Dwellings can be built on raised, well-compacted fill material. Drainage tile should be installed around footings to prevent damage by excessive wetness. Extra reinforcement of footings and foundations and backfilling with sand or gravel will help prevent damage by shrinking and swelling of the soil. Sewage lagoons will function if properly designed and installed. The bottom and berms of the lagoon may have to be sealed to prevent contamination of ground water. Wetness, frost action, and low strength are limitations for local roads and streets. Roads can be constructed on raised, well-compacted fill material, or the water table can be lowered with side ditches and culverts. Roads can be strengthened by adding a suitable base material.

The land capability classification is IIIw. The woodland ordination symbol is 3w.

91—Forestdale silty clay loam. This is a poorly drained soil in slightly concave, old abandoned stream channels and depressional basins. It is subject to occasional flooding. Individual areas are typically elongated in a north-south direction and range from 6 to 200 acres or more.

Typically, the surface layer is dark grayish brown silty clay loam about 4 inches thick. The subsoil, about 56 inches thick, is gray, mottled silty clay in the upper part and light brownish gray and light gray, mottled silty clay loam in the lower part. In some places the surface layer is silt loam.

Included with this soil in mapping are small areas of poorly drained Amagon soils. The Amagon soils are at slightly higher elevations and contain less clay in the subsoil than the Forestdale soil. These inclusions make up about 1 to 10 percent of the unit.

Permeability of this Forestdale soil is very slow, and surface runoff is slow. The available water capacity and organic matter content are moderate. Natural fertility is medium. Reaction ranges from medium acid through very strongly acid, but can be neutral to mildly alkaline in the surface layer as a result of local liming practices. A high water table is at a depth of .5 foot to 2 feet during wet periods in winter and spring. The surface layer is difficult to till, and in low places the soil remains wet for long periods during winter and spring.

Most areas are used for cultivated crops, but a few small areas remain in woodland. This soil is suited to rice, grain sorghum, irrigated corn, winter wheat, and soybeans; it is usually too wet and poorly aerated for cotton. Stands of winter wheat are commonly reduced by standing water in small areas. While wetness is the main management concern, properly built and maintained field ditches can usually remove excess surface water. Land grading enhances surface drainage, fills potholes, and provides a plane for supplemental irrigation. Incorporating crop residue into the surface layer helps to maintain fertility and tilth.

This soil is suited to trees, and a few areas remain in woodland. Equipment limitation, seedling mortality, windthrow, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Ridging the soil and planting on the ridges will help achieve better survival rates. Lighter, less extensive, and more frequent thinnings to reduce stand density will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil is suited to reservoir areas for fisheries and other aquatic habitats, and a few areas remain in these uses. Although there are only slight limitations for reservoir construction, supplemental water may be required to maintain desired water levels during prolonged dry periods.

This soil generally is not suited to building site development and onsite waste disposal because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

93—Collins silt loam. This is a nearly level, moderately well drained soil on low convex areas of flood plains. These soils are subject to occasional flooding. Individual areas are along small tributaries that extend into uplands, or they are adjacent to larger stream channels.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The substratum, to a depth of about 60 inches or more, is friable silt loam. It is strong brown in the upper part; yellowish brown and dark yellowish brown, mottled in the middle part; and light gray, mottled in the lower part.

Included with this soil in mapping are small areas of somewhat poorly drained Falaya soils. The Falaya soils are at lower elevations in the drainage pattern of the flood plains. These inclusions make up about 5 to 10 percent of the unit.

Permeability of this Collins soil is moderate, and the surface runoff is slow. Available water capacity and natural fertility are high. Organic matter content is moderately low. The reaction in the surface layer varies widely as a result of local liming practices. The underlying layers are strongly acid or very strongly acid. The high water table is at a depth of 2 to 5 feet during wet periods in winter and spring. The surface layer is very friable and easily tilled over a fairly wide range of moisture conditions.

Most areas are used for cultivated crops, pasture, and hay. This soil is suited to soybeans, cotton, corn, wheat, grain sorghum, and grasses and legumes for hay and pasture. Short durations of occasional flooding or overflow from higher positions is the main management concern. Most excess water stands for only a few hours before removal by local drainage ditches.

Pasture and hay, or both, are common uses of this soil in the upland creek bottoms. Overgrazing or grazing when the soil is wet causes surface compaction and poor tilth. Using equipment to work hayland when the soil is wet would produce the same result. Timely deferment of grazing and restricted use during wet periods are good management practices necessary to maintain the pasture in good condition.

This soil is suited to trees, and some narrow bottoms support stands of trees. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIw. The woodland ordination symbol is 1o.

95—Farrenburg fine sandy loam. This is a nearly level, moderately well drained soil on slightly convex natural levees of the former braided stream system of a river delta. It is subject to rare flooding. Individual areas vary widely in size and shape. They range from about 10 to more than 500 acres.

Typically, the surface layer is dark brown and brown fine sandy loam about 7 inches thick. The subsurface layer is yellowish brown, friable fine sandy loam. The subsoil is about 40 inches thick. It is dark yellowish brown, mottled, firm loam. The substratum, to a depth of 65 inches or more, is dark brown loamy sand. In places the surface layer is very dark grayish brown. A few other areas have a thinner subsoil, and the depth to the substratum is about 36 inches.

Included with this soil in mapping are small areas of well drained Broseley and moderately well drained Canalou soils. The Broseley soils are on higher and better drained positions and contain more sand. The Canalou soils are on similar positions and have less clay in the subsoil. These inclusions make up about 1 to 15 percent of the unit.

Permeability of this Farrenburg soil is moderate, and surface runoff is slow. The available water capacity is high, and organic matter content is low. Natural fertility is medium. Reaction is very strongly acid to medium acid in the subsoil, but can be slightly alkaline in the surface layer and subsurface because of local liming practices. The surface layer is very friable and easily tilled over a wide range of moisture content. A weak plowpan often forms at the base of the surface layer, particularly if the soil has been tilled when it is wet or tilled repeatedly at the same depth. The water table perches at a depth of 2 to 3 feet during wet periods in winter and spring.

Most areas are used for cultivated crops. A few areas are used for pasture. This soil is suited to soybeans, cotton, wheat, corn, grain sorghum, and grasses and legumes for pasture and hay. The subsoil is saturated during wet periods in winter and spring. The surface layer is subject to soil blowing if large areas are left unprotected. Winter cover crops and wind stripcrops help prevent soil loss and protect young seedlings. Depressional areas that drain small areas may temporarily pond runoff for short periods after heavy rains. Excess surface water ordinarily can be removed by field ditches. Incorporating crop residue into the soil improves fertility, increases water infiltration, and maintains organic matter content.

Only a few small areas of this soil are used for pasture and hayland. The stands of deep-rooted perennial plants may be reduced by wetness. Restricted grazing during wet periods is advisable to avoid surface compaction.

This soil is well suited to trees, but very few areas remain in woodland (fig. 22). Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIs. The woodland ordination symbol is 2o.

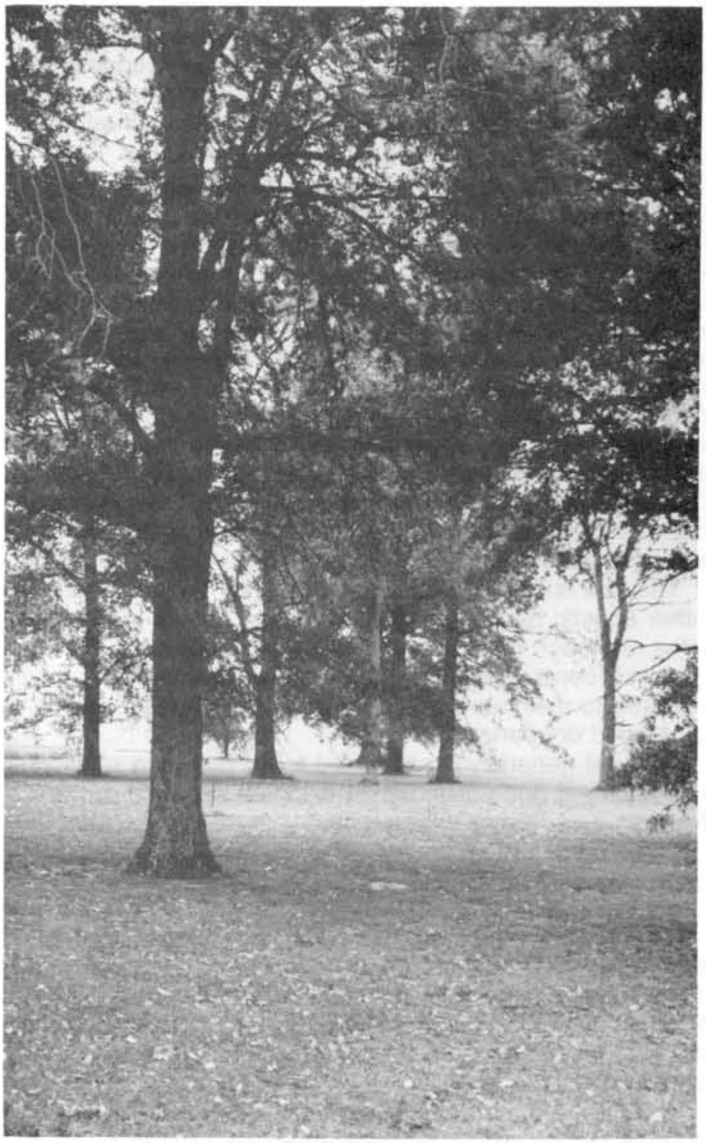

Figure 22.—Farm woodlot on Farrenburg fine sandy loam.

97—Zachary silt loam. This is a nearly level, poorly drained soil on flood plains. It is subject to occasional flooding. Areas are about 6 to 2,000 acres or more.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsurface layer is light gray; light gray, mottled; and light brownish gray, mottled silt loam about 26 inches thick. The subsoil, to a depth of 60 inches or more, is light brownish gray and light gray, mottled silty clay loam.

Included with this soil in mapping are poorly drained Calhoun and Falaya soils and somewhat poorly drained Crowley soil. These soils are on the same general landform. The Calhoun soil has a surface layer and subsurface horizon less than 24 inches thick and has pockets of silty subsurface material intermixed with the subsoil. The Falaya soil has a silt loam texture throughout. The Crowley soil has more clay in the subsoil. These inclusions make up to about 15 percent of the unit.

Permeability of this Zachary soil is slow, and surface runoff is slow to very slow. Available water capacity is high, and the natural fertility is low. The organic matter content is low. The reaction ranges from medium acid through very strongly acid, but the surface layer can range from slightly acid to neutral as a result of local liming practices and irrigation. The high water table is at a depth of .5 foot to 1.5 feet during wet periods in winter and spring. The surface layer is friable and has good tilth. It is easily worked, but tends to puddle and crust after hard rains.

Most areas of this soil are used for row crops. This soil is suited to soybeans, grain sorghum, corn, wheat, and rice. The main problem to be concerned with is wetness. Excess surface water can normally be removed by a system of field and lateral ditches. Land grading helps eliminate potholes, enhances surface drainage, and provides a suitable grade for irrigation. Residue management that leaves a protective cover on the surface helps reduce surface crusting and improve fertility and water intake.

This soil is suited to trees, and a few areas are still in native hardwoods. Equipment limitation, seedling mortality, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Ridging the soil and planting on the ridges will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

99—Tuckerman fine sandy loam. This is a nearly level, poorly drained soil in concave areas of natural levees of the old Mississippi braided stream system. It is subject to occasional flooding. Areas generally are elongated and are about 6 to 80 acres or more.

Typically, the surface layer is dark grayish brown and grayish brown fine sandy loam about 9 inches thick. The subsoil is about 29 inches thick. The upper part is gray, mottled, firm loam; the lower part is gray, mottled, firm sandy clay loam. The substratum is light brownish gray, mottled loamy fine sand to a depth of 60 inches or more. In some areas there is a clay loam layer in the subsoil.

Included with this soil in mapping are small areas of moderately well drained Farrenburg soils and poorly drained Gideon and Wardell soils. The Farrenburg soils are at higher elevations. The Gideon soils have a dark surface layer more than 6 inches thick, have more clay, and are on slightly lower positions. The Wardell soils are on the same positions as the Tuckerman soil, but have a darker surface layer and more clay. These inclusions make up about 5 to 15 percent of the unit.

Permeability of this Tuckerman soil is moderately slow, and surface runoff is slow. The available water capacity is high. Organic matter content and natural fertility are low. Reaction ranges from medium through very strongly acid in the subsoil, but ranges to neutral in the surface layer in many places as a result of local liming practices and irrigation. The water table perches to within a foot of the surface during wet periods in winter and spring. The surface layer is usually friable and easily tilled, but puddles and crusts after rains or after irrigation.

Most areas of this soil are used for cultivated crops. A few areas are used for pasture and hay. It is suited to soybeans, cotton, wheat, corn, grain sorghum, and rice, as well as grasses and legumes for hay and pasture. Wetness is the main management concern, but excess surface water generally can be removed by a system of field ditches. Land grading provides better drainage, helps eliminate potholes, and provides a uniform grade for supplemental irrigation. Managing crop residue so that a protective cover is left on the surface and the rest is incorporated into the soil helps maintain organic matter content and reduce crusting. A traffic pan often forms if this soil is tilled when it is wet or if traffic routes are not managed.

The use of this soil for pasture or hay is limited because most of the acreage is used for cropland. Compaction and poor tilth result from grazing when the soil is wet. Timely grazing and restricted use when the soil is wet are necessary to maintain the soil and pasture in good condition.

This soil is suited to trees, but only a few areas are in native hardwoods. Equipment limitation, seedling mortality, windthrow, and plant competition are concerns in management. Equipment operations should be timed for periods when the soil is dry or frozen. Ridging the soil and planting larger stock on the ridges will help achieve better survival rates. Light, frequent thinnings will reduce windthrow damage. Plant competition can be reduced by thorough site preparation, which may include spraying or cutting.

This soil generally is not suited to building site development and onsite waste disposal systems because of the flooding.

The land capability classification is IIIw. The woodland ordination symbol is 2w.

Prime Farmland

The best land for farming is called prime farmland. Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the amount of this high-quality farmland is limited, it should be used with wisdom and foresight.

Prime farmland is the land best suited for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops where it is treated and managed with acceptable farming methods. Given minimal inputs of energy and economic resources, prime farmland produces higher yields and causes less damage to the environment than other land.

Prime farmland may now be cropland, pasture, woodland, or anything other than urban or built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

The soils that make up prime farmland usually have an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity is suitable. These soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope gradient is mostly under 6 percent.

Some soils that have limitations—such as a high water table or flooding—may qualify as prime farmland if these limitations are overcome by corrective measures. In Stoddard County, most soils have been sufficiently drained by such measures as back furrows, end-row ditches, dead furrows, and road ditches, along with spot drainage and land grading. Onsite evaluation is necessary, however, to see if the corrective measures are effective. More detailed information on the criteria for prime farmland can be obtained from the local staff of the Soil Conservation Service or the Missouri University Extension Service.

Nearly 80 percent of Stoddard County, or about 429,511 acres, is prime farmland. The upland Crowley's Ridge part of the county has scattered areas, and the Western lowlands and Moorehouse lowlands are mostly prime farmland. Almost all of this prime farmland is used for crops, mainly corn and soybeans, cotton, rice and green sorghum. The crops grown on prime farmland account for an estimated four-fifths of the county's agriculture income.

A recent trend in land use in a few areas of the county has been the conversion of some prime farmlands to urban, suburban, and industrial uses. Such loss of prime farmland to other uses increases the agricultural use of less suitable soils, which generally are more erodible, droughty, and difficult to cultivate and are usually less productive.

The detailed soil map units that make up the prime farmland in Stoddard County are listed in Table 5. Any corrective measures needed are indicated in parentheses. This table, however, is not a recommendation for a particular land use.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

More than 367,209 acres in Stoddard County were used for crops and pasture in 1981, according to the Missouri Crop and Livestock Reporting Service. Of this total, 19,700 acres were in soybeans and 11,600 acres in wheat, much of which was followed in rotation by soybeans. About 46,500 acres were in corn; 108,000 acres in grain sorghum; 19,300 acres in rice; 9,500 acres in pasture, mostly on the upland portion of the county; and small acreages in orchards, cabbage, watermelons, cantaloupes, popcorn, peanuts, and horticultural crops.

The potential for increased production of food and fiber is good. Urban and built-up areas are increasing, but at present are not a great threat to using land for crops. A few acres of woodland have potential for cropland, but these areas are a valuable resource for wetlands and timber. Woodland on steep slopes or highly dissected areas offers no potential for increased food or fiber production. Production can be increased on existing farmland by improved drainage, where wetness is a limiting factor, and by protection from local overflow during wet seasons. Much can be done by land grading to eliminate potholes and provide a plane for supplemental irrigation. Ground water is plentiful at economical depths and is available on almost all the delta portions of the county.

Soil drainage is the major management concern on most of the cropland and on the delta portion of the pastureland in Stoddard County. The delta soils are naturally wet because of their position on the landscape, their slow permeability, or both. The slowly and very slowly permeable Roellen and Sharkey soils are in positions on the landscape that receive runoff from other soils. Because runoff is slow or very slow, these soils stay wet for long periods. The Calhoun and Crowley soils of the Western lowlands also stay wet for long periods because they are in such large, nearly level areas and because of slow or very slow permeability and slow runoff. Areas of Gideon, Lilbourn, Sikeston, and Wardell soils also accumulate runoff from adjacent higher soils. Excess water is removed from most of the soils through a system of field ditches. Many areas are shaped or graded to provide drainage. The Calhoun and Crowley soils and the Loring soils on toe slopes and benches are wet in winter and spring because of a perched water table. These soils dry out and produce good summer crops. Many of these crops are irrigated.

The somewhat poorly drained Dundee, Foley, and Lilbourn soils are good soils for cropland. Because of drainage improvements by various drainage districts, only the Lilbourn soils are subject to rare flooding.

Canalou and Farrenburg soils are moderately well drained and are somewhat limited by wetness. The wetness, however, is not a major problem for crops. Loring soils on sloping uplands are also moderately well drained, but water runs off these soils because of their slopes and wetness is not a serious limitation during the cropping season.

Most excess surface water can easily be removed by a system of field ditches and land grading. Land grading eliminates potholes and provides a suitable grade for supplemental irrigation water.

Soil erosion is the major concern on about a third of the county. Not all of this acreage is in crops or pasture. Some of it is in orchards, some in pasture, and some in woodland. A small amount consists of active and abandoned sand and gravel pits.

Brandon, Eustis, Goss, Loring, and Memphis soils are subject to water erosion because of their slopes. Loss of the surface layer through erosion reduces the productivity and contributes to poor tilth. The surface layer contains most of the plant nutrients and organic matter needed for plant growth. When the surface layer is lost and subsoil material is in the plow layer, the tilth is difficult to maintain. This eroded surface layer puddles and crusts, resulting in a substantially lower water intake rate.

Loring soils are especially damaged by loss of the surface layer, since they have a brittle subsoil horizon that limits the available water capacity and root development. The eroded materials are transported by runoff into ponds and streams. Controlling runoff minimizes sediments and pollutants and improves water quality for municipal and recreational uses, as well as for fish and wildlife. Cover crops, conservation tillage, terraces, no-till, diversions, permanent vegetation, grassed waterways, and contouring are good management practices to control erosion.

Soil blowing is a hazard, particularly on the sandy Canalou and Malden soils. If not protected, Bosket, Broseley, and Farrenburg soils are subject to blowing. Soil blowing not only causes soil loss but damages young plants. Conservation tillage, winter cover crops, wind stripcrops, perennial grass barriers and field windbreaks help to reduce or control this hazard.

Soil fertility is naturally low in several of the soils of Stoddard County. These soils respond well to fertilizer and lime. Soils of the Western lowlands and Crowley's Ridge, the upland part of the county, require liming since they are mostly strongly or very strongly acid. Soils east of the uplands are geologically younger and generally are not so acid. Many of the upland soils and the alluvial soils west of the uplands are low in potash. Natural supplies of phosphorous are generally adequate in the soils of Stoddard County. Nitrogen is the nutrient most widely applied in fertilizer. Liming benefits most of the soils by improving the tilth and the biological environment for soil organisms.

Soil tilth is an important factor in seedbed preparation and the resultant stands of crops or grasses. Soils with good tilth have a granular structure in the surface layer, are easily tilled, and readily accept moisture as a result of the porous nature of the surface layer.

Sandy surface layers of soils such as the Canalou and Malden soils are easily tilled into a good seedbed, but are subject to soil blowing. The fine sandy loam and sandy loam surface layer of Farrenburg and Lilbourn soils is easily tilled and holds moisture well, but is subject to soil blowing in large areas if not protected. The silt loam and loam surface layers of Calhoun, Crowley, Dubbs, Dundee, Falaya, Gideon, Loring, Memphis, and Wardell soils are easily tilled and make a good seedbed. Soils low in organic matter such as the Calhoun, Crowley, Foley, Mhoon, Waverly, and Zachary soils form a crust on the surface after heavy rains. This crust reduces water infiltration. Maintaining a protective residue cover and returning organic residue to the surface layer is an effective method to reduce crusting.

The silty clay loam, silty clay, and clay surface layers of soils such as the Forrestdale, Kobel, Roellen, and Sharkey soils are difficult to work into a good seedbed. If these soils are tilled when they are wet, the surface layer tends to become a mass of hard clods when it dries. Plowing during the fall or early in spring, with subsequent rains, generally melts the clods into small aggregates that make a more desirable seedbed.

The soils with sand, and loamy sand, and loam surface layers are ideally suited to many crops (truck crops) not now commonly grown in Stoddard County. Sunflowers, strawberries, sweet potatoes, and cabbage are presently grown on small and very small acreages but could become major cash crops. More oats, barley, alfalfa, and other close-growing crops could also be grown.

The major specialty crops grown commercially in the county are peaches, apples, popcorn, and hybrid seed corn. Large areas can be used to produce these crops, as well as nursery plants and berries. Several thousand acres of soils in the county are ideally suited to catfish farming. Commercial production of crayfish is also possible on some of the soils. Inadequate markets for aquaculture products is the most limiting factor.

Supplemental irrigation is practiced mostly on the bottomland and terrace soils throughout the county, although a few small areas of upland soils are also irrigated. The irrigation is applied on an as-needed basis.

Selected areas are not irrigated in some years, but other areas are irrigated many times. Most of the irrigation is the furrow type. Some sprinkler systems are used on graded areas and on the naturally more rolling surfaces not suited to grading. Much of the corn grown in Stoddard County is irrigated, except that grown on the upland soils. Some grain sorghum, cotton, and soybeans are also irrigated, but generally not to the same extent as corn. The soils irrigated range in texture from clay to sand and in drainage from poor to excessive.

The latest information and suggestions for growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The table also shows the capability classification for each unit.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey (*27*). These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use. There are no class I soils in Stoddard County.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use. There are no class V soils in Stoddard County.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. There are no class VIII soils in Stoddard County.

Capability subclasses are soil groups within one class. They are designated 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* shows 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 only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation. The capability classification of each map unit is given in the section "Detailed Soil Map Units." It is also shown on table 6.

Woodland Management and Productivity

James L. Robinson, forester, Soil Conservation Service, helped prepare this section.

Woodland makes up 9 percent of Stoddard County, according to a 1972 survey conducted by the Forest Service of the U.S. Department of Agriculture (*8*). In presettlement time, bottomland forest was the dominant vegetation. The Missouri Archeological Society defines five types of forest cover that were in the flood plain region of the bootheel (*14*). Remnants of these forest types can still be found today. They are:

The Cottonwood-Sycamore natural levee forest. Sycamore, cottonwood, and elm were the dominant tree species. This plant community was restricted to natural levees of the active river channel and was infrequently inundated.

The Sweetgum-Elm "cane ridge" forest. Dominant plant species were sweetgum, elm, and hackberry with a dense cane undergrowth. This plant community was widespread in the region and was on almost all soils except clays or newly deposited materials. It was normally not inundated except in times of high floods.

The Sweetgum-Elm-Cypress seasonal swamp forest type. This type was located in areas subject to seasonal periods of inundation. It appears to have developed in the flood plain interior on the lower part of old backslope remnants and in other low areas in clay soils.

The Willow and/or Cottonwood water edge brush. Willow and cottonwood were the main components in this plant community, which was frequently inundated. This community was characteristic of newly made ground along the river and in the interior on the fringes of bayous, swamps, and lakes.

The Cypress deep swamp. Baldcypress and water tupelo were dominant in this plant community. They were normally under at least a light sheet of water throughout the year.

The Loring-Memphis-Falaya association is located along Crowley's Ridge and is the only upland association in Stoddard County. Northern red oak, white oak, scarlet oak, black oak, hickories, elm, sugar maple, and yellow poplar are found on the Loring and Memphis soils. Falaya is a bottomland soil in this association. Sweetgum, shagbark, and shellbark hickory, cherrybark oak, along with other bottomland hardwoods, are the common tree species on the Falaya soil.

The remaining soil associations occur on bottom lands, terraces, and natural levees. Most of these associations have been cleared for crop production. The majority of the timbered sites are restricted to wet areas that have poor drainage or to farm woodlots. Depending on the drainage characteristics of the site, the common trees are swamp chestnut oak, cherrybark oak, white oak, green ash, Nuttall oak, willow oak, sweetgum, silver maple, American sycamore, pecan, American elm, boxelder, and eastern cottonwood.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Windbreaks and Environmental Plantings

James L. Robinson, forester, helped prepare this section.

Soils in Stoddard County considered to have a moderate to severe soil blowing hazard are the Malden, Canalou, Broseley, Bosket, Lilbourn, Dubbs, and Farrenburg soils. Soil blowing depletes the soil resource and damages many of the commonly grown crops during their seedling stage.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well-prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

Edward A. Gaskins, biologist, Soil Conservation Service, helped prepare this section.

Stoddard County has a total of 29,606 acres of existing recreational developments, according to the facility inventory portion of the 1980 Statewide Comprehensive Outdoor Recreation Plan (*24*). Ownership of these areas is 99 percent federal and state, and the remainder is under municipal and private control. The facilities include lakes, river access sites, swimming areas, hunting and fishing areas, campsites, trails, game courts, ballfields, picnic areas, play areas, and wildlife observation areas. One report projects a growth (10.9 percent) in the total county population (28,700) by 1990 (*17*).

Mingo National Wildlife Refuge, with over 21,000 acres, is the largest public recreational area in the county. This refuge contains 4,500 acres of deep fresh marshes and 12,500 acres of wooded swamps. This amounts to 56 percent of all the wetlands that remain in the entire delta region of Missouri. Mingo, along with the state areas, preserves a remnant of a unique ecosystem that once occupied 2.5 million acres of this region. State lands include the Duck Creek, Otter Slough, and Crowley's Ridge Wildlife Areas, Holly Ridge Preserve and Forest, and the new Oak Ridge Forest. These areas provide more than 10,000 acres for public access.

There are also several private and semi-private recreation enterprises in operation (*19*). These include pay fishing lakes, an archery club, golf courses, a hunting area, a day camp, and a nature area.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Edward A. Gaskins, biologist, Soil Conservation Service, helped prepare this section.

Stoddard is one of seven counties that make up the Mississippi Lowlands Zoogeographic Region in Missouri (*18*). Topographically, this region forms the northern extremity of the great Mississippi Valley Delta that begins at the Gulf of Mexico. It was once part of a great cypress swamp, but over the past 100 years drainage and timber activities have converted most of the region to farmland.

Today, less than 10 percent of the county is woodland. The remainder is cultivated cropland and a limited amount of grassland. The limited amount of woodland habitat and the large field size are major factors affecting the wildlife resource in the county. Some crop fields are so large that they extend a mile from one drainage ditch to the next. Adequate cover that extends into food-producing crop fields is a major habitat element that is in relatively short supply.

The Loring-Memphis-Falaya association, in the area of Crowley's Ridge, provides the best wildlife habitat in the county. Much of the remaining land lacks the diversity, interspersion, and edge necessary to maintain large wildlife populations. The Loring-Memphis-Falaya association is the only association that has a significant (29 percent) amount of woodland remaining. The other associations add small (1-10 percent) amounts of woodland to this habitat base.

Deer, turkey, and squirrel populations are all rated good to excellent for a delta county, but poor compared to animal numbers in the rest of the state. The county has a very small resident woodcock population. Annual migratory flights increase the numbers of this gamebird somewhat each fall.

Furbearer numbers are very good in Stoddard County. Muskrat, raccoon, opossum, mink, coyote, gray fox, beaver, and striped skunk are the principal fur animals trapped in the county. The St. Francis River watershed is one of the last remaining habitats for the river otter, a protected furbearer in Missouri. Songbird populations are good to excellent in all of the soil associations. Large concentrations of blackbirds and crows sometimes cause problems in cropland areas.

The remaining 10 associations furnish habitat for openland wildlife. Cropland makes up 90 to 100 percent of the land area in each association. Grassland and woodland are in extremely short supply as components of wildlife habitat. Woodland cover is limited to property boundaries and certain drainage ditches, and grassy areas are primarily confined to roadsides.

Quail, rabbit, and dove numbers are rated good to excellent by local conservation officials. The best quail habitat is north of Route 60. The delta region has the highest fall concentration of migrating mourning dove in Missouri (*17*). Korean pheasants have been stocked in the past, and surveys indicate a steady growth in their numbers in the future.

Privately owned wetlands are becoming very scarce in Stoddard County. Most have already been drained and placed in crop production. State and federal waterfowl refuges contain most of the remaining permanent wetlands. Together with the St. Francis River area and the many miles of drainage ditches, these refuges provide habitat for good to excellent fall populations of waterfowl. Wood duck numbers are reported excellent wherever their special habitat requirements can be met. The Crowley-Amagon-Calhoun and Roellen-Mhoon-Commerce associations typify those furnishing habitat for wetland wildlife species.

There are about 173 miles of perennial streams in the county (*17*). The St. Francis and Castor Rivers along with Mingo Creek, Angle, Floodway and Oldfield drainage ditches provide local sport fishing. These waters contain catfish, sunfish, bass, drum, crappie, carp, buffalofish, carpsucker, and gar. Public impoundment fishing is available at four state and federal wildlife areas, two city reservoirs, and five private pay fishing lakes. Many of the nearly 1,800 farm ponds have been stocked and provide fishing for owners and their guests. These smaller impoundments usually contain a combination of largemouth bass, channel catfish, and bluegill.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, millet, soybeans, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, switchgrass, orchardgrass, indiangrass, clover, alfalfa, and Korean lespedeza.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are ragweed, beggarweed, pokeweed, foxtail, eraton, and partridgepea.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, blackgum, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, sumac, persimmon, and sassafras. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, wild plum, crabapple, amur honeysuckle, gray dogwood, and hazelnut.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, cypress, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cattail, cutgrass, rushes, sedges, and buttonbush.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, red fox, and mourning dove.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, owls, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excessive gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils; loamy soils that have a relatively high content of clay; soils that have only 20 to 40 inches of suitable material; soils that have an appreciable amount of gravel, stones, or soluble salts; or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey; have less than 20 inches of suitable material; have a large amount of gravel, stones, or soluble salts; have slopes of more than 15 percent; or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is about as much as 15 percent, an appropriate modifier is added, for example, "cherty." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops.

They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

In table 17, some soils are assigned to two hydrologic groups. Soils that have a seasonal high water table but can be drained are assigned first to a hydrologic group that denotes the drained condition and then to a hydrologic group that denotes the undrained condition; for example, B/D. Because there are different degrees of drainage and water table control, onsite investigation is needed to determine the hydrologic group of the soil in a particular location.

Flooding, the temporary inundation of an area, is caused by overflowing streams, or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*28*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning river, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, acid, thermic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*26*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*28*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allemands Series

The Allemands series consists of deep, very poorly drained organic soils on flood plains. These soils formed in well-decomposed organic material overlying clayey alluvium. Permeability is rapid in the organic material and very slow in the underlying clayey horizons. Slopes are less than 1 percent.

Allemands soils are adjacent to Gideon and Roellen soils. Gideon soils do not have an organic surface horizon and have more sand, silt, and clay throughout. Roellen soils do not have an organic surface horizon and have a clayey B horizon. Both Gideon and Roellen soils are in slightly higher positions than Allemands soils.

Typical pedon of Allemands muck, about 1,800 feet east and 1,400 feet south of the northwest corner of section 3, T. 28 N., R. 11 E.

Op—0 to 5 inches; black (N 2/0) muck; less than 2.5 percent fibers, trace when rubbed; strong fine granular structure; friable; many very fine, fine, and medium grass roots; neutral; abrupt smooth boundary.

Oa1—5 to 14 inches; black (N 2/0) muck; about 2.5 percent fibers, trace when rubbed; massive, firm; many very fine, fine, and medium grass roots; neutral; clear smooth boundary.

Oa2—14 to 25 inches; black (10YR 2/1) muck; 10 percent fibers, trace when rubbed; massive; friable; few very fine and fine grass roots; neutral; clear smooth boundary.

Cg—25 to 28 inches; very dark gray (10YR 3/1) mucky silty clay; 10 to 15 percent fibers, trace when rubbed; massive; very sticky; neutral; clear smooth boundary.

Oa3—28 to 48 inches; very dark brown (10YR 2/2) muck; 25 to 50 percent fibers, less than 5 percent when rubbed; massive; friable; neutral; clear smooth boundary.

C'g—48 to 64 inches; dark gray (10YR 4/1) mucky silty clay; less than 2.5 percent fibers, trace when rubbed; massive; very sticky; mildly alkaline.

Thickness of the organic material ranges from 25 to 48 inches. Fiber content after rubbings is less than 5 percent. The organic horizons are slightly acid to mildly alkaline.

The mineral fraction is dominantly silty clay. However, clay and silty clay loam are common. The mineral horizons are neutral to mildly alkaline.

Amagon Series

The Amagon series consists of deep, poorly drained, slowly permeable soils on low terraces. These soils formed in silty sediment. Slopes range from 0 to 1 percent.

Amagon soils are similar to Calhoun soils and are commonly adjacent to Calhoun, Crowley, and Forestdale soils. Calhoun soils have tongues of the E horizon extending into the B horizon. Crowley soils typically are on slightly higher terraces than Amagon soils, are more than 35 percent clay in the subsoil, and have an abrupt textural change between the E and B horizons. Forestdale soils are in lower areas than Amagon soils and are 35 to 60 percent clay in the control section.

Typical pedon of Amagon silt loam, in a cultivated field about 1,350 feet south and 1,875 feet west of the northeast corner of sec. 7, T. 24 N., R. 9 E.

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many fine roots; very strongly acid; clear smooth boundary.

Ap2—4 to 7 inches; dark grayish brown (10YR 4/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; firm; common fine roots; few fine concretions of iron and manganese oxides; very strongly acid; abrupt smooth boundary.

Btg1—7 to 12 inches; light brownish gray (10YR 6/2) silty clay loam; many medium prominent strong brown (7.5YR 4/6) mottles; weak fine subangular blocky structure; firm; common fine roots; many fine vesicular pores and few fine tubular pores; few faint clay films in pores; many fine and very fine concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Btg2—12 to 50 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; common fine roots; many fine vesicular pores and tubular pores; common prominent clay films in pores and root channels; many yellowish red (5YR 5/8) and reddish brown (5YR 5/4) stains in pores and few fine reddish brown (5YR 5/4) stains on faces of peds; common fine concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Btg3—50 to 59 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine subangular blocky structure; firm; few fine and medium roots; common fine and very fine vesicular pores; common distinct clay films on faces of peds; many yellowish red (5YR 4/4) stains in pores and on faces of peds; very strongly acid; clear smooth boundary.

BCg—59 to 69 inches; gray (10YR 6/1) silt loam; weak fine subangular blocky structure; firm; few fine roots; common fine vesicular and many fine discontinuous tubular pores; common fine red (2.5YR 4/8) and many fine red (2.5YR 4/6) stains; neutral.

Thickness of the solum ranges from 51 to 70 inches or more.

The Ap horizon has value of 4 or 5 and chroma of 2.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

Askew Series

The Askew series consists of deep, moderately well drained, moderately permeable soils on natural levees or low terraces along former drainageways of major streams. These soils formed in silty and loamy alluvium. Slopes range from 1 to 4 percent.

Askew soils are similar to Dubbs soils and are adjacent to Amagon, Calhoun, and Crowley soils. Amagon and Calhoun soils have a gray B horizon and are in lower positions than Askew soils. Crowley soils have more clay in the subsoil and are in lower positions. Dubbs soils do not have chroma of 2 in the upper 10 inches of the argillic horizon.

Typical pedon of Askew silt loam, 1 to 4 percent slopes, about 2,800 feet west and 1,850 feet north of the southeast corner of sec. 6, T. 25 N., R. 9 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

BA—6 to 13 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and medium vesicular and tubular pores; many fine concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Bt1—13 to 28 inches; light brownish gray (10YR 6/2) silty clay loam; many faint medium and large pale brown (10YR 6/3) mottles, few prominent medium strong brown (7.5YR 5/8) mottles; weak and moderate fine subangular blocky structure; firm; many fine and medium vesicular and tubular pores; few distinct clay films on faces of peds; many fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Bt2—28 to 46 inches; light brownish gray (10YR 6/2) loam; many coarse distinct strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; firm; many fine vesicular and tubular pores; few faint clay films on faces of peds; common fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

C—46 to 60 inches; brown (7.5YR 5/2) fine sandy loam; many coarse distinct dark brown (7.5YR 3/4) and strong brown (7.5YR 4/6) mottles; massive; firm; few fine vesicular and tubular pores; common prominent clay films in old root channels; few fine concretions of iron and manganese oxides; strongly acid.

Thickness of the solum ranges from 22 to 46 inches. The soil ranges from very strongly acid to medium acid, unless it has been limed.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. It is dominantly silt loam, although the range includes loam and very fine sandy loam.

The Bt horizon has value of 5 or 6 and chroma of 2. Mottles are in shades of gray and brown. The Bt horizon is silt loam, loam, or silty clay loam.

The C horizon is very fine sandy loam, fine sandy loam, or silty clay loam. In some pedons it is sand below a depth of 40 inches.

Bosket Series

The Bosket series consists of deep, well drained, moderately permeable soils on natural levees. These soils formed in loamy alluvial sediment. Slopes range from 1 to 14 percent.

Bosket soils commonly are adjacent to Broseley, Dubbs, and Malden soils. Broseley soils are sandier and are on higher, more convex parts of the levees. Dubbs soils have more silt. Malden soils are sandy throughout and are in higher and lower positions than Bosket soils.

Typical pedon of Bosket fine sandy loam, 1 to 5 percent slopes, eroded, 1,800 feet north and 1,220 feet west of the southeast corner of sec. 2, T. 28 N., R. 10 E.

Ap1—0 to 4 inches; dark brown (10YR 3/3) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Ap2—4 to 9 inches; brown (10YR 4/3) fine sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

BA—9 to 15 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; firm; few fine roots; common fine tubular pores; few worm casts; neutral; clear smooth boundary.

Bt1—15 to 26 inches; brown (7.5YR 4/4) sandy clay loam; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few faint clay bridges between sand grains; neutral; gradual smooth boundary.

Bt2—26 to 37 inches; brown (7.5YR 4/4) sandy clay loam; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few faint clay films on faces of peds and in pores; few faint black (10YR 2/1) stains on faces of peds; strongly acid; gradual smooth boundary.

Bt3—37 to 45 inches; brown (7.5YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; firm; few fine and very fine tubular pores; few faint clay films in pores; strongly acid; clear smooth boundary.

C—45 to 66 inches; brown (7.5YR 4/4) fine sandy loam; common coarse prominent yellowish brown (10YR 5/6) and common medium prominent light brownish gray (10YR 6/2) mottles; massive; firm; common fine pores; few faint clay films in pores; strongly acid.

The solum is 30 to 50 inches thick. The soil ranges from strongly acid to slightly acid, except where it has been limed.

The A horizon has value of 3 or 4 and chroma of 2 or 3. The BA horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is commonly fine sandy loam, although the range includes sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is sandy clay loam, sandy loam, or fine sandy loam.

Bosket fine sandy loam, 5 to 9 percent slopes, severely eroded, and Bosket fine sandy loam, 9 to 14 percent slopes, severely eroded, have a thinner dark surface layer than is definitive for the Bosket series. This difference does not significantly affect the management of these soils for most uses.

Brandon Series

The Brandon series consists of deep, well drained soils on uplands. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. These soils formed in loess and the underlying loamy and gravelly sediments. Slopes range from 5 to 14 percent.

Brandon soils commonly are adjacent to Loring and Memphis soils. Loring soils have a brittle subsoil layer at a depth of less than 30 inches and are in lower, less sloping positions than Brandon soils. Memphis soils are deeper over the gravelly substratum and are generally in lower positions.

Typical pedon of Brandon silt loam, 9 to 14 percent slopes, about 300 feet east and 825 feet north of the southwest corner of sec. 2, T. 26 N., R. 10 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; many fine herbaceous roots; many fine and very fine tubular pores; few chert and quartz pebbles; neutral; abrupt smooth boundary.

E—3 to 5 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; many fine herbaceous roots; many fine and very fine tubular pores; few chert and quartz pebbles; neutral; abrupt smooth boundary.

BE—5 to 8 inches; brown (7.5YR 5/4) silt loam; weak fine and medium subangular blocky structure; firm; many fine herbaceous roots; many fine and very fine tubular pores; few chert and quartz pebbles; slightly acid; clear smooth boundary.

Bt1—8 to 14 inches; strong brown (7.5YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; firm; many fine herbaceous roots; many fine and very fine tubular pores; few faint clay films on faces of peds; few chert and quartz pebbles; very strongly acid; gradual smooth boundary.

Bt2—14 to 32 inches; strong brown (7.5YR 4/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; many fine and very fine tubular pores; common distinct clay films on faces of peds; few patchy dark stains; common chert and quartz pebbles; very strongly acid; gradual smooth boundary.

2Bt3—32 to 45 inches; dark brown (7.5YR 4/4) gravelly loam; weak medium and coarse subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; common distinct clay films on faces of peds; 25 percent gravel; patchy dark stains; very strongly acid; gradual boundary.

2C1—45 to 52 inches; dark brown (7.5YR 4/4) extremely gravelly loam; massive; dense and compact; few fine roots; 80 percent gravel; very strongly acid; gradual boundary.

2C2—52 to 60 inches; dark brown (7.5YR 4/4) extremely gravelly sandy loam; massive; dense and compact; few fine roots; 85 percent gravel; very strongly acid.

The solum is 24 to 50 inches thick. The soil is very strongly acid to strongly acid, except where it has been limed.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The B horizon has value of 4 or 5 and chroma of 4 to 6. It is silt loam, silty clay loam, or gravelly loam.

Broseley Series

The Broseley series consists of deep, somewhat excessively drained soils on convex natural levees. Permeability is moderately rapid. These soils formed in sandy and loamy alluvium. Slopes range from 1 to 5 percent.

Broseley soils commonly are adjacent to Farrenburg, Lilbourn, and Malden soils. Farrenburg soils are more clayey and have mottles with chroma of 2 in the B horizon. They are in lower, nearly level, adjoining areas. Lilbourn soils are grayer throughout, do not have an argillic horizon, and are on lower drains and flats. Malden soils are sandy throughout and are in higher areas than Broseley soils.

Typical pedon of Broseley loamy fine sand, 1 to 5 percent slopes, about 2,500 feet north and 800 feet west of the southeast corner of sec. 24, T. 25 N., R. 10 E.

Ap—0 to 8 inches; dark yellowish brown (10YR 3/4) loamy fine sand, light yellowish brown (10YR 6/4) dry; single grain; loose to very friable; many fine and medium roots; mildly alkaline; abrupt smooth boundary.

E1—8 to 15 inches; brown (7.5YR 4/4) loamy fine sand; weak medium granular structure; friable; common fine roots; mildly alkaline; gradual smooth boundary.

E2—15 to 27 inches; dark yellowish brown (10YR 4/4) loamy fine sand; weak fine and medium granular structure; friable; common fine roots; mildly alkaline; gradual smooth boundary.

Bt1—27 to 39 inches; yellowish brown (10YR 5/6) fine sandy loam; few fine and medium pale brown (10YR 6/3) mottles and light brownish gray (10YR 6/2) mottles in lower part; weak fine subangular blocky structure; firm; common fine roots; few faint clay films on faces of peds and in pores; strongly acid; gradual smooth boundary.

Bt2—39 to 50 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) fine sandy loam; many fine distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; few faint clay films on faces of peds and in pores; strongly acid; gradual smooth boundary.

C—50 to 63 inches; yellowish brown (10YR 5/6) sand; common fine distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; single grain; loose; strongly acid.

Thickness of the solum ranges from 48 to 60 inches or more. Depth to the argillic horizon ranges from 24 to 36 inches.

The Ap horizon has value of 3 or 4 and chroma of 3 or 4. The E horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam or sandy clay loam. It is strongly acid to very slightly acid.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is strongly acid to very slightly acid.

Calhoun Series

The Calhoun series consists of deep, poorly drained, slowly permeable soils in depressions of terraces. These soils formed in silty alluvium or loess. Slopes range from 0 to 1 percent.

Calhoun soils are similar to Amagon soils and commonly are adjacent to Amagon, Crowley, and Dubbs soils. Amagon soils do not have tonguing of gray silty material into the B horizon and are on lower basins and flood plains. Crowley soils have more clay in the Bt horizon and are in slightly lower positions on terraces. Dubbs soils have a matrix that does not have chroma of 2 and are in higher positions than Calhoun soils on convex natural levees.

Typical pedon of Calhoun silt loam, about 2,700 feet south and 2,000 feet west of the northeast corner of sec. 18, T. 26 N., R. 8 E.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; many fine roots; few tubular pores; strongly acid; abrupt smooth boundary.

Eg—7 to 18 inches; light gray (10YR 7/1) silt loam or silt; common medium prominent yellowish brown (10YR 5/6) mottles; massive; very firm; common fine roots; many fine vesicular pores; few strong brown (7.5YR 5/6) stains on structural faces; few medium concretions of iron and manganese oxides; very strongly acid; clear wavy boundary.

B/E—18 to 30 inches; light brownish gray (10YR 6/2) silty clay loam (Btg); common medium prominent yellowish brown (10YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; about 25 percent light gray (10YR 7/1) silt loam (Eg) in tongues; few fine roots; many fine vesicular pores; few coarse concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg1—30 to 45 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; common fine pores; common clay films on faces of peds and in pores and former root channels; many fine and medium concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg2—45 to 65 inches; light brownish gray (10YR 6/2) silty clay loam; few medium distinct yellowish brown (10YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; few fine vesicular pores; few faint grayish brown (10YR 5/2) clay films on faces of peds and in pores; few black (10YR 2/1) stains on faces and peds; slightly acid.

The solum is 40 to 60 or more inches thick.

The Ap horizon has value of 4 or 5 and chroma of 1 to 3. It is very strongly acid to medium acid, except where it has been limed. The E horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. It is very strongly acid to medium acid except where it has been limed.

The E part of the B/E horizon has the same characteristics as the E horizon. The Bt horizon and the Bt part of the B/E horizon have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Mottles are in shades of brown, yellow, and gray. The Bt horizon is very strongly to slightly acid, although in some areas it ranges to neutral with depth.

Canalou Series

The Canalou series consists of deep, moderately well drained, moderately rapidly permeable soils on low convex natural levees. These soils formed in sandy and loamy alluvium. Slopes range from 0 to 2 percent.

Canalou soils commonly are adjacent to Broseley, Farrenburg, and Lilbourn soils. Broseley soils have a thick E horizon and an argillic horizon. Farrenburg soils have more clay in the upper part of the solum and have an argillic horizon. These soils are in positions similar to those of the Canalou soils. Lilbourn soils dominantly have chroma of 2 and are in lower positions than Canalou soils.

Typical pedon of Canalou loamy sand, about 300 feet east and 2,850 feet south of the northwest corner of sec. 24, T. 26 N., R. 12 E.

Ap1—0 to 5 inches; dark brown (10YR 3/3) loamy sand, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

Ap2—5 to 10 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine subangular blocky structure; firm; few fine roots; slightly acid; abrupt smooth boundary.

BA—10 to 20 inches; dark brown (7.5YR 4/4) loamy sand; many medium and coarse prominent light brownish gray (10YR 6/2) mottles; weak fine and very fine subangular blocky structure; very friable; few fine roots; common fine pores; medium acid; clear smooth boundary.

Bw1—20 to 29 inches; dark brown (10YR 4/3) sandy loam; many medium and coarse faint light brownish gray (10YR 6/2) and prominent strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; very friable; few fine roots; few fine pores; strongly acid; clear smooth boundary.

Bw2—29 to 39 inches; brown (10YR 5/3) sandy loam; many medium and coarse faint light brownish gray (10YR 6/2) and prominent strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few fine pores; strongly acid; clear smooth boundary.

BC—39 to 50 inches; dark yellowish brown (10YR 4/4) loamy sand; many medium and coarse distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; very friable; medium acid; gradual smooth boundary.

C—50 to 60 inches; yellowish brown (10YR 5/4) coarse sand; few medium and coarse distinct light brownish gray (10YR 6/2) mottles; single grain; loose; many small pebbles; medium acid.

Thickness of the solum ranges from about 39 to 60 inches.

The A horizon has value of 3 or 4 and chroma of 2 to 4. It is strongly acid to neutral. The A or Ap horizon is dominantly loamy sand, although the range includes loamy fine sand.

The BA horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is loamy sand. It is strongly acid to slightly acid. The Bw horizon has value of 4 to 6 and chroma of 2 to 4. It is fine sandy loam or sandy loam. It is strongly acid to neutral.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is loamy sand or sand and is medium acid to neutral.

Collins Series

The Collins series consists of deep, moderately well drained, moderately permeable soils on low convex flood plains adjacent to uplands. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Collins soils are adjacent to Falaya, Loring, and Memphis soils. Falaya soils have a grayer C horizon and are in depressional parts of the flood plains. Loring and Memphis soils have an argillic horizon and are on adjacent slopes on uplands.

Typical pedon of Collins silt loam, about 2,050 feet south and 600 feet east of the northwest corner of sec. 6, T. 27 N., R. 10 E.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; many fine and very fine roots; many very fine tubular pores; common fine vesicular pores; few worm channels and casts; neutral; abrupt smooth boundary.

C1—7 to 15 inches; strong brown (7.5YR 5/4) silt loam; weak medium and coarse granular structure; friable; few fine and very fine roots; many fine and very fine tubular pores; few fine vesicular pores; many worm channels and casts; common black (10YR 2/1) stains; strongly acid; clear smooth boundary.

C2—15 to 24 inches; yellowish brown (10YR 5/4) silt loam; few fine prominent light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm; few fine and very fine roots; many fine and very fine tubular pores; few fine vesicular pores; common worm channels and casts; black (10YR 2/1) stains in pores and on faces of peds; strongly acid; gradual smooth boundary.

C3—24 to 33 inches; dark yellowish brown (10YR 4/4) silt loam; common fine prominent light gray (10YR 7/2) and very pale brown (10YR 7/3) mottles; massive; firm; many very fine and few fine tubular pores; few worm channels and casts; few black (10YR 2/1) stains; common fine and very fine concretions of iron and manganese oxides; strongly acid; gradual smooth boundary.

C4—33 to 48 inches; dark yellowish brown (10YR 4/4) silt loam; many medium prominent light gray (10YR 7/2) mottles; massive; firm; many fine tubular pores; few worm channels and casts; few black (10YR 2/1) stains; common fine and very fine concretions of iron and manganese oxides; strongly acid; gradual smooth boundary.

C5—48 to 60 inches; light gray (10YR 7/2) and dark yellowish brown (10YR 4/4) silt loam; massive; firm; many very fine and few fine tubular pores; few black (10YR 2/1) stains; common fine and very fine concretions of iron and manganese oxides; strongly acid.

The soil is strongly acid or very strongly acid, except where it has been limed.

The A horizon has value of 4 or 5 and chroma of 3 or 4.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6; below a depth of 48 inches, it has value of 4 to 7 and chroma of 2 to 4.

Commerce Series

The Commerce series consists of deep, somewhat poorly drained, moderately slowly permeable soils on low natural levees and flood plains. These soils formed in recent silty alluvium. Slopes range from 0 to 1 percent.

Commerce soils are similar to Convent and Mhoon soils and are commonly adjacent to Convent, Falaya, and Sharkey soils. Convent soils have less clay. Mhoon soils are grayer in the upper part of the B horizon. Falaya soils are more acid, have less clay, and are on alluvial fans of adjoining tributaries. Sharkey soils are poorly drained, are very fine, and are on lower basins and abandoned stream channels.

Typical pedon of Commerce silt loam, about 2,100 feet north and 50 feet east of the southwest corner of sec. 24, T. 28 N., R. 11 E.

Ap1—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine and very fine roots; few worm channels and casts; neutral; abrupt smooth boundary.

Ap2—6 to 11 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine roots; few fine and very fine tubular pores; few worm channels and casts; neutral; abrupt smooth boundary.

Bw—11 to 17 inches; dark grayish brown (10YR 4/2) silt loam; many medium fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular structure; firm; common fine roots; many fine and very fine tubular pores; few worm channels and casts; few fine concretions of iron and manganese oxides; neutral; clear smooth boundary.

Bg—17 to 28 inches; grayish brown (10YR 5/2) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few fine concretions of iron and manganese oxides; neutral; clear smooth boundary.

2Bgb1—28 to 36 inches; dark grayish brown (10YR 4/2) silty clay loam; many fine and medium prominent strong brown (7.5YR 4/6) mottles; strong fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few fine concretions of iron and manganese oxides; neutral; gradual smooth boundary.

2Bgb2—36 to 49 inches; dark gray (10YR 4/1) silty clay; common medium prominent dark yellowish brown (10YR 4/4) mottles; strong fine subangular blocky structure; firm; few fine and very fine roots; many fine and very fine tubular pores; few fine concretions of iron and manganese oxides; neutral; gradual smooth boundary.

2Cg—49 to 68 inches; gray (10YR 5/1) silty clay; many medium prominent strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; many fine concretions of iron and manganese oxides; neutral.

The overlying silty material is 28 to 40 inches thick. The soil ranges from slightly acid to mildly alkaline throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It is typically silt loam, although the range includes silty clay loam and very fine sandy loam.

The B horizon has hue of 10YR or 2.5YR, value of 4 or 5, and chroma of 1 or 2. It is silt loam, silty clay loam, or loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Mottles of gray and brown are common. The C horizon is silty clay, silty clay loam, or loam and is commonly stratified.

Convent Series

The Convent series consists of deep, somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 3 percent.

Convent soils are similar to Commerce and Falaya soils and commonly are adjacent to Commerce, Mhoon, and Roellen soils. Commerce soils have more clay. Falaya soils are acid. Mhoon soils are grayer and commonly are in lower positions. Roellen soils have much more clay, are grayer, and are in lower positions.

Typical pedon of Convent silt loam, about 2,600 feet north and 80 feet west of the southeast corner of sec. 12, T. 28 N., R. 11 E.

Ap1—0 to 6 inches; dark brown (10YR 4/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; friable; mildly alkaline; abrupt smooth boundary.

Ap2—6 to 8 inches; dark grayish brown (10YR 4/2) silt loam; many fine faint grayish brown (10YR 5/2) mottles; massive; firm; few fine vesicular pores; few fine concretions of iron and manganese oxides; mildly alkaline; abrupt smooth boundary.

Cg1—8 to 16 inches; grayish brown (10YR 5/2) silt loam; many fine and medium prominent dark brown (7.5YR 3/4) mottles; weak fine subangular blocky structure; firm; many fine vesicular pores; many fine concretions of iron and manganese oxides; mildly alkaline; clear smooth boundary.

Cg2—16 to 28 inches; grayish brown (10YR 5/2) silt loam; many fine and medium prominent brown (7.5YR 5/4) mottles; weak fine subangular blocky structure; firm; many fine vesicular pores; many fine and medium concretions of iron and manganese oxides; slightly acid; clear smooth boundary.

Cg3—28 to 49 inches; grayish brown (10YR 5/2) silt loam; many medium and coarse prominent strong brown (7.5YR 4/6) mottles; weak fine subangular blocky structure; firm; many fine vesicular pores; many fine concretions of iron and manganese oxides; slightly acid; gradual smooth boundary.

Cg4—49 to 66 inches; light gray (10YR 6/1) silt loam; common medium and coarse prominent strong brown (7.5YR 3/4) mottles; weak fine subangular blocky structure; friable; few very fine vesicular pores; few black (10YR 2/1) stains on faces of peds and in pores; many fine concretions of iron and manganese oxides; mildly alkaline.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It ranges from medium acid to mildly alkaline.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 2. Some pedons have value of 6 and chroma of 1 below a depth of 40 inches. Some pedons have strata, making up as much as 40 percent of the control section, that have value of 4 to 6 and chroma of 2 to 4. The C horizon ranges from slightly acid to moderately alkaline.

Crowley Series

The Crowley series consists of deep, somewhat poorly drained, very slowly permeable soils on terraces. These soils formed in silty and clayey sediment. Slopes range from 0 to 1 percent.

Crowley soils commonly are adjacent to Amagon, Calhoun, and Forestdale soils. Amagon soils are poorly drained, have less clay in the argillic horizon, and are on lower adjacent positions. Calhoun soils have tongues of gray silty material in the argillic horizon, have less clay, and are generally in slightly higher positions. Forestdale soils do not have gray silty subsurface horizons and an abrupt textural change between the A and B horizons. They are in positions similar to those of the Crowley soils.

Typical pedon of Crowley silt loam, about 1,300 feet east and 150 feet south of the northwest corner of sec. 31, T. 24 N., R. 9 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak fine granular structure; friable; common fine and very fine roots; common fine and very fine pores; many fine soft iron and manganese masses; neutral; abrupt smooth boundary.

E—4 to 9 inches; light gray (10YR 7/1) silt loam; common fine prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; common fine and very fine roots; common fine and very fine pores; common fine concretions of iron and manganese oxides; very strongly acid; abrupt smooth boundary.

Btg1—9 to 21 inches; grayish brown (2.5Y 5/2) silty clay; common coarse prominent strong brown (7.5YR 5/8) mottles; weak medium angular blocky structure; firm; common fine and very fine roots; common fine and very fine vesicular pores; common fine and few medium concretions of iron and manganese oxides; very strongly acid; clear wavy boundary.

Btg2—21 to 37 inches; grayish brown (2.5YR 5/2) silty clay; few fine prominent strong brown (7.5YR 5/8) mottles; moderate fine and medium angular blocky structure; firm; few fine and very fine roots; few fine and very fine vesicular pores; few fine concretions of iron and manganese oxides; very strongly acid; gradual wavy boundary.

Btg3—37 to 52 inches; grayish brown (2.5YR 5/2) silty clay; few fine prominent yellowish brown (10YR 5/6) mottles; common fine and very fine vesicular pores; moderately alkaline; gradual wavy boundary.

BCg—52 to 72 inches; light brownish gray (2.5Y 6/2) silty clay; many fine and very fine prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate fine angular blocky structure; firm; few fine and very fine vesicular pores; many fine and very fine concretions of iron and manganese oxides; moderately alkaline.

The solum is about 47 to 72 inches thick. Depth to the Btg horizon is 5 to 18 inches.

The Ap or A1 horizon has value of 4 or 5 and chroma of 1 or 2. The E horizon has value of 6 or 7 and chroma of 1 or 2. The A and E horizons typically are very strongly acid; however, they range to neutral where this soil has been limed.

The Bt horizon has value of 4 to 6 and chroma of 1 or 2. It has common to many yellowish brown or strong brown mottles. The Bt horizon is silty clay or silty clay loam. It is very strongly acid or slightly acid. The BC horizon, where present, has hue of 5Y or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay or silty clay loam. The BC horizon and C horizon, where present, are medium acid to moderately alkaline.

Dubbs Series

The Dubbs series consists of deep, well drained, moderately permeable soils on convex natural levees. These soils formed in silty alluvium. Slopes range from 1 to 5 percent.

West of Crowley's Ridge, Dubbs soils commonly are adjacent to Amagon, Calhoun, and Crowley soils. Amagon soils are poorly drained and are in lower adjacent positions. Calhoun soils are poorly drained, have tongues of albic material in the argillic horizon, and are on adjacent low terraces. Crowley soils are somewhat poorly drained, have more clay in the Bt horizon, and are in lower positions on terraces.

East of Crowley's Ridge, Dubbs soils commonly are adjacent to Bosket, Broseley, and Dundee soils. Bosket soils have more sand that is coarser than very fine in the argillic horizon. They have a darker surface layer and are in higher positions than Dubbs soils. Broseley soils have a sandy epipedon 4 to 36 inches thick and are in similar areas on the landscape. Dundee soils are somewhat poorly drained and are in lower positions than Dubbs soils.

Typical pedon of Dubbs silt loam, 1 to 5 percent slopes, about 1,000 feet west and 1,700 feet north of the southeast corner of sec. 5, T. 26 N., R. 8 E.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine and fine roots; many very fine pores; very strongly acid; abrupt smooth boundary.

BA—6 to 15 inches; brown (7.5YR 4/4) silt loam; weak fine subangular blocky structure; friable; many fine and very fine roots; many fine and very fine pores; few worm channels and casts; very strongly acid; clear smooth boundary.

Bt1—15 to 26 inches; dark brown (7.5YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; many fine and very fine roots; many fine and very fine pores and few medium pores; few faint clay films on faces of peds and distinct clay films in old pores; very strongly acid; clear smooth boundary.

Bt2—26 to 46 inches; dark brown (7.5YR 4/4) silty clay loam; weak fine subangular blocky structure; friable; many fine and very fine roots; many fine and very fine pores and few medium pores; few faint clay films on faces of peds and distinct clay films in old root channels and pores; few fine soft iron and manganese masses; very strongly acid; clear smooth boundary.

Bt3—46 to 60 inches; dark brown (7.5YR 4/4) silt loam; few medium prominent strong brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; firm; common very fine and few fine roots; few faint clay films on faces of peds and prominent clay films in pores; few fine soft iron and manganese masses; very strongly acid.

The solum is 35 to 60 inches thick. The soil typically ranges from medium acid to very strongly acid; however, the surface layer ranges to neutral if it has been limed or irrigated.

The A horizon has value of 4 and chroma of 2 or 3. It typically is silt loam, although the range includes very fine sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silty clay loam, silt loam, or loam. Some pedons have mottles in the lower part of the Bt horizon and in the BC horizon, where present.

Dundee Series

The Dundee series consists of deep, somewhat poorly drained, moderately slowly permeable soils on natural levees and terraces. These soils formed in loamy and silty alluvium. Slopes range from 0 to 2 percent.

Dundee soils are similar to Amagon soils and, on the higher terraces west of Crowley's Ridge, commonly are adjacent to Amagon, Calhoun, Crowley, and Loring soils. Amagon soils are grayer throughout. Calhoun soils have tongues of gray silty material that extend into the argillic horizon. They are in lower, slightly depressional positions. Crowley soils have more clay and are in either slightly lower or higher positions than Dundee soils. Loring soils have a compact subsoil and are in higher, more sloping areas.

East of Crowley's Ridge, Dundee soils commonly are adjacent to Farrenburg and Lilbourn soils. Farrenburg soils have more sand, are not as gray, and are in the more nearly level positions. Lilbourn soils do not have an argillic horizon, are less acid, and have more sand. They are in depressional areas.

Typical pedon of Dundee loam, about 2,700 feet west and 1,200 feet north of the southeast corner of sec. 5, T. 23 N., R. 10 E.

Ap1—0 to 4 inches; dark brown (10YR 4/3) loam, very pale brown (10YR 7/3) dry; weak fine and medium subangular blocky and weak fine granular structure; friable; few fine roots; moderately alkaline; abrupt smooth boundary.

Ap2—4 to 10 inches; dark brown (10YR 4/3) loam, very pale brown (10YR 7/3) dry; weak coarse subangular blocky and weak medium platy structure; firm; few fine and very fine tubular pores; moderately alkaline; abrupt smooth boundary.

Btg1—10 to 18 inches; grayish brown (10YR 5/2) silty clay loam; common medium dark brown (10YR 4/3) mottles; weak fine and medium subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; few faint clay films; very strongly acid; gradual smooth boundary.

Btg2—18 to 27 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent yellowish brown (7.5YR 5/6) mottles; weak and moderate fine subangular blocky structure; firm; many fine and very fine tubular pores; common distinct clay films; common fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg3—27 to 39 inches; grayish brown (10YR 5/2) silty clay loam; many strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; common distinct clay films; common fine and medium concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg4—39 to 46 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few faint clay films; few fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

BCg—46 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; many strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few fine concretions of iron and manganese oxides; very strongly acid.

The solum is 36 to 60 inches thick. The soil typically is medium acid to very strongly acid; however, the surface layer ranges to moderately alkaline where it has been limed.

The A horizon has value of 4 or 5 and chroma of 2 or 3. It typically is loam, although the range includes silt loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. It is silt loam or silty clay loam. Mottles are in shades of brown and gray.

The BC horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silt loam or silty clay loam. Mottles are in shades of dark brown and gray.

Eustis Series

The Eustis series consists of deep, somewhat excessively drained, rapidly permeable soils on strongly dissected coastal plains. These soils formed in coarse textured marine or fluvial sediment. Slopes range from 14 to 40 percent.

Eustis soils commonly are adjacent to Brandon and Memphis soils. Brandon soils have more silt in the upper part of the profile and are gravelly in the lower part. Memphis soils have more silt throughout. Brandon and Memphis soils are in higher positions than Eustis soils.

Typical pedon of Eustis loamy sand in an area of Eustis-Memphis complex, 14 to 40 percent slopes, in a wooded area 1,200 feet north and 300 feet west of the center of sec. 23, T. 26 N., R. 11 E.

O—1 inch to 0; slightly decomposed organic detritus (leaves, twigs, acorns, etc.).

A—0 to 2 inches; very dark grayish brown (10YR 3/2) loamy sand, grayish brown (10YR 5/2) dry; moderate fine granular structure; very friable; many fine woody roots; common invertebrate channels and casts; approximately 5 percent clean uncoated white (10YR 8/1) sand grains; 2 percent chert pebbles; few krotovinas about 1 inch across; slightly acid; clear smooth boundary.

E—2 to 33 inches; yellowish brown (10YR 5/4) sand; single grain; loose; common tree roots; 1 to 2 percent chert pebbles; few krotovinas about 1 inch across; minor admixture of clean white (10YR 8/1) sand in upper 10 inches and no more than 1 percent clay; very strongly acid; gradual smooth boundary.

E&Bt—33 to 40 inches; pale brown (10YR 6/3) sand (E); lamellae of strong brown (7.5YR 5/6) loamy sand (Bt) coated with iron and clay; single grain and weak subangular blocky structure; very friable; wavy and discontinous lamellae 1/8 to 1/2 inch thick; few fine and medium woody roots; few fine chert pebbles; few fine concretions of iron and manganese oxides; very strongly acid; abrupt wavy boundary.

Bt—40 to 72 inches; reddish yellow (7.5YR 5/8) loamy sand; common fine and medium very pale brown (10YR 7/3) mottles; weak coarse subangular blocky structure; friable; few fine and medium woody roots; very strongly acid.

Thickness of the solum is 60 inches or more.

The A horizon has value of 3 to 5 and chroma of 2 to 5. It is slightly acid to very strongly acid, becoming more acid as the depth increases.

The Bt horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 6 to 8.

Eustis soils in Stoddard County are slightly cooler and drier and are steeper than is definitive for the Eustis series. These differences do not significantly affect the management of these soils for most uses.

Falaya Series

The Falaya series consists of deep, somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium washed from nearby loess-covered uplands. Slopes range from 0 to 2 percent.

Falaya soils are similar to Collins and Convent soils and commonly are adjacent to Collins, Loring, and Memphis soils. Collins soils are not as gray, and Convent soils are nonacid. Loring and Memphis soils have an argillic horizon and are on adjacent upland slopes.

Typical pedon of Falaya silt loam, about 1,400 feet south and 500 feet west of the northeast corner of sec. 14, T. 26 N., R. 10 E.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; friable; many fine roots; few fine pores; few fine soft iron and manganese masses; very strongly acid; abrupt smooth boundary.

C1—7 to 10 inches; brown (10YR 5/3) silt loam; common fine faint pale brown (10YR 6/2) mottles; weak medium platy structure parting to weak very fine subangular blocky; firm; few fine roots in upper part of horizon; many fine and very fine pores; many fine and very fine soft iron and manganese masses; very strongly acid; abrupt smooth boundary.

C2—10 to 17 inches; intermingled gray (10YR 6/1) and brown (10YR 5/3) silt loam; weak fine subangular blocky structure; firm; slightly brittle; many fine and very fine pores; many fine and very fine soft iron and manganese masses; very strongly acid; gradual smooth boundary.

Cg1—17 to 26 inches; light gray (10YR 7/1) silt loam; many common distinct yellowish brown (10YR 5/4) mottles; weak thick platy structure; firm; slightly brittle; common fine and very fine pores; few fine soft iron and manganese masses; very strongly acid; clear smooth boundary.

Cg2—26 to 32 inches; pale brown (10YR 6/2) silt loam; many fine distinct light gray (10YR 7/1) and common fine distinct dark yellowish brown (10YR 4/6) mottles; weak thick platy structure parting to weak very fine subangular blocky; firm; slightly brittle; many fine and very fine pores; many fine and very fine soft iron and manganese masses; very strongly acid; clear smooth boundary.

Egb—32 to 36 inches; light gray (10YR 7/1) silt; few fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; slightly brittle; few fine and very fine vesicular pores; very strongly acid; abrupt smooth boundary.

Bxb—36 to 54 inches; dark yellowish brown (10YR 4/4) silt loam; common fine faint pale brown (10YR 6/3) mottles; weak coarse prismatic structure parting to weak fine subangular blocky; firm; 30 percent brittleness; common fine and very fine pores; few faint clay films on vertical cleavage faces and in old pores; vertical tongues of light gray (10YR 7/1) silt 5 to 15 millimeters wide throughout the horizon; common fine soft iron and manganese masses; very strongly acid; clear smooth boundary.

Bwb—54 to 75 inches; pale brown (10YR 6/3) silt loam; many fine distinct dark yellowish brown (10YR 4/6) mottles; weak moderate medium platy structure parting to weak fine subangular blocky; firm; many fine and very fine vesicular pores; few faint clay films in old pores; vertical streaks of light gray (10YR 7/1) silt; common fine and very fine soft iron and manganese masses; very strongly acid.

Depth to buried soil, where present, is 30 to 40 inches. The soil is strongly acid or very strongly acid, unless it has been limed.

The Ap horizon has value of 4 and chroma of 2 or 3.

The C horizon has value of 4 to 7 and chroma of 1 to 3. It is mottled in shades of yellow, brown, and gray.

Farrenburg Series

The Farrenburg series consists of deep, moderately well drained, moderately permeable soils on natural levees. These soils formed in loamy and sandy alluvium. Slopes range from 0 to 3 percent.

Farrenburg soils are adjacent to Broseley, Canalou, Dundee, and Lilbourn soils. Broseley soils have more sand in the upper 20 to 40 inches and do not have mottles of low chroma in the upper 10 inches of the argillic horizon. They are in higher positions than Farrenburg soils. Canalou soils do not have an argillic horizon, have less clay in the upper part of the solum, and are in lower areas. Dundee soils are somewhat poorly drained, have less sand and more clay, and are in lower depressions and drainageways. Lilbourn soils have a grayer B horizon, do not have an argillic horizon, and are in lower positions.

Typical pedon of Farrenburg fine sandy loam, 2,150 feet west of 250 feet north of the southeast corner of sec. 9, T. 25 N., R. 11 E.

Ap1—0 to 3 inches; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; common fine and very fine roots; neutral; abrupt smooth boundary.

Ap2—3 to 7 inches; brown (10YR 4/3) fine sandy loam; massive parting to weak fine granular structure; firm; compact plowpan; few fine roots; neutral; abrupt smooth boundary.

E—7 to 18 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; few fine and very fine roots; many fine and very fine tubular pores; slightly acid; abrupt smooth boundary.

Bt1—18 to 32 inches; dark yellowish brown (10YR 4/4) loam; common fine prominent light brownish gray (10YR 6/2) mottles; weak fine and medium subangular blocky structure; firm; few fine herbaceous roots; common fine woody roots; many fine and very fine tubular pores; few distinct dark brown (7.5YR 4/4) clay films on faces of peds and in old pores; medium acid; gradual smooth boundary.

Bt2—32 to 58 inches; dark yellowish brown (10YR 4/4) loam; many fine prominent light brownish gray (10YR 6/2) mottles; few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to weak fine and medium subangular blocky; firm; few fine woody roots; many fine tubular pores; few distinct dark brown (7.5YR 4/4) clay films on faces of peds and in old pores; nearly continuous coatings of light brownish gray (10YR 6/2) fine sandy loam and very fine sandy loam 1/8 to 1/4 inch thick between prisms; medium acid; abrupt smooth boundary.

C—58 to 65 inches; dark brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; 5 to 10 percent pebbles 1/8 to 1/4 inch in diameter; medium acid.

The solum is 40 to 60 or more inches thick.

The Ap horizon has value of 3 or 4 and chroma of 3 or 4. Value is 6 or more when the soil is dry. The Ap horizon typically is fine sandy loam, although the range includes loamy fine sand. It is strongly acid to slightly acid, except where it has been limed. The E horizon has value of 4 or 5 and chroma of 4 to 6. It is strongly acid to slightly acid, except where it has been limed or irrigated.

The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is loam or sandy loam and has gray and brown mottles. It is strongly acid to slightly acid.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. Some pedons have gray or brown mottles. The C horizon is fine sandy loam, loamy sand, or sand. It is medium acid to neutral.

Foley Series

The Foley series consists of deep, poorly drained, very slowly permeable sodic soils on broad terraces. These soils formed in silty alluvium or loess. Slopes range from 0 to 2 percent.

Foley soils are adjacent to Calhoun, Crowley, and Dubbs soils. Calhoun soils do not have a natric horizon. Crowley soils are not as gray, have a fine textured argillic horizon, and do not have a natric horizon. Calhoun and Crowley soils are in lower positions than Foley soils. Dubbs soils are not as gray, do not have a natric horizon, and are on higher convex natural levees.

Typical pedon of Foley silt loam, 1,450 feet east and 2,640 feet south of the northwest corner of sec. 6, T. 24 N., R. 9 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak fine granular structure; friable; common fine and very fine roots; many fine pores; neutral; abrupt smooth boundary.

E—4 to 7 inches; grayish brown (10YR 5/2) silt loam; weak medium platy structure; friable; few fine and very fine roots; common fine and very fine pores; few fine soft iron and manganese masses; neutral; gradual irregular boundary.

Btg1—7 to 15 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable; few fine and very fine roots; many fine and very fine vesicular pores; common light gray (10YR 7/1) silt coats on faces of peds; few distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; few fine soft iron and manganese masses; strongly alkaline; gradual irregular boundary.

Btg2—15 to 25 inches; gray (10YR 6/1) silty clay loam; many coarse prominent strong brown (7.5YR 5/8) mottles; weak fine and medium angular and subangular blocky structure; firm; many fine and very fine pores; few faint clay films on faces of peds and in some pores; few fine soft iron and manganese masses; strongly alkaline; clear smooth boundary.

Btg3—25 to 34 inches; light olive gray (5Y 6/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to weak fine subangular blocky; firm; many fine and very fine pores; discontinuous dark veining on all vertical faces of peds; few distinct clay films in some pores; few fine soft iron and manganese masses; strongly alkaline; clear wavy boundary.

Btg4—34 to 49 inches; gray (5Y 6/1) silt loam; many common prominent strong brown (7.5YR 4/6-5/8) mottles; weak fine subangular blocky structure; firm; many fine and very fine vesicular pores; few faint clay films in some pores and on faces of peds; few fine soft iron and manganese masses; strongly alkaline; clear smooth boundary.

BC—49 to 78 inches; yellowish brown (10YR 5/3) silt loam; common fine prominent gray (10YR 6/1) mottles; weak medium platy structure breaking to weak fine subangular blocky; firm; many fine and very fine vesicular pores; few faint clay films in some pores and on faces of some peds; few fine black stains on faces of peds; strongly alkaline.

The solum is about 45 to 78 or more inches thick. The natric horizon is within 7 to 16 inches of the upper boundary of the B horizon.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. It ranges from very strongly acid to medium acid, except where it has been limed. The E horizon has value of 5 or 6 and chroma of 1 or 2.

The Btg horizon has hue of 10YR or 5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam or silt loam. It ranges from neutral to strongly alkaline.

Forestdale Series

The Forestdale series consists of deep, poorly drained, very slowly permeable soils on natural levees or low terraces. These soils formed in silty and clayey alluvium. Slopes range from 0 to 3 percent.

Forestdale soils commonly are adjacent to Amagon, Calhoun, or Crowley soils. Amagon soils have less clay in the control section and are in slightly higher positions. Calhoun soils have less clay in the B horizon, have tongues of gray silty material that extend into the argillic horizon, and are on slightly higher terraces. Crowley soils are somewhat poorly drained, have an abrupt textural change between the subsurface layer and the subsoil, and are in slightly higher positions on terraces.

Typical pedon of Forestdale silty clay loam, 1,780 feet east and 810 feet south of the northwest corner of sec. 31, T. 28 N., R. 10 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam, light gray (10YR 7/2) dry; weak fine granular and weak fine subangular blocky structure;

friable; common fine and very fine roots; slightly acid; abrupt smooth boundary.

Btg1—4 to 22 inches; gray (10YR 5/1) silty clay; many medium prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; few fine roots; few fine discontinuous tubular pores; few dark stains on faces of peds; common distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg2—22 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse prominent yellowish red (5YR 4/6) mottles; weak fine subangular blocky structure; firm; few fine roots; few fine tubular pores; common distinct clay films on faces of peds; many fine and very fine concretions of iron and manganese oxides; strongly acid; gradual smooth boundary.

BCg—40 to 60 inches; light gray (10YR 6/1) silty clay loam; common fine prominent yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; firm; common fine tubular pores; patchy black stains on faces of peds and in pores; common fine and very fine concretions of iron and manganese oxides; very slightly acid.

The solum ranges from 40 to more than 60 inches in thickness.

The A horizon has value of 4 or 5 and chroma of 1 or 2. It is strongly acid to medium acid, unless it has been limed.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It has mottles in shades of gray and brown. It is silty clay loam, silty clay, or clay and is very strongly acid to medium acid. The BCg horizon is similar in color to the Bt horizon. It is strongly acid to mildly alkaline.

Gideon Series

The Gideon series consists of deep, poorly drained, moderately slowly permeable soils on drainageways of low natural levees. These soils formed in loamy alluvium. Slopes range from 0 to 1 percent.

Gideon soils are similar to Wardell soils and commonly are adjacent to Lilbourn, Roellen, Sharkey, and Wardell soils. Lilbourn soils have less clay in the upper horizons, are not as gray, have a lighter colored surface layer, and are in similar positions. Roellen soils have a mollic epipedon, have more clay, and are in similar positions. Sharkey soils have much more clay and are generally in lower positions on the landscape than Gideon soils. Wardell soils have an argillic horizon and are more acid.

Typical pedon of Gideon loam, 2,050 feet north and 1,100 feet west of the southeast corner of sec. 2, T. 25 N., R. 12 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure in upper 5 inches changing to massive in lower 2 inches; friable in upper 5 inches ranging to very firm in lower 2 inches; common very fine and fine roots; few fine tubular pores in massive zone; neutral; abrupt smooth boundary.

Cg1—7 to 13 inches; gray (10YR 5/1) sandy clay loam; common fine prominent reddish yellow (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm; few fine roots; common fine and very fine tubular pores; common very dark grayish brown (10YR 3/2) organic stains on faces of peds; neutral; clear smooth boundary.

Cg2—13 to 38 inches; light gray (10YR 6/1) clay loam; common coarse prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few dark gray (10YR 4/1) stains on faces of peds; common fine concretions of iron and manganese oxides; neutral; gradual smooth boundary.

Cg3—38 to 53 inches; light gray (10YR 6/1) clay loam; common coarse prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few dark gray (10YR 4/1) stains on faces of peds; few fine concretions of iron and manganese oxides; neutral; clear smooth boundary.

Cg4—53 to 63 inches; light gray (5Y 6/1) sandy clay loam; common coarse prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm; few fine roots; common fine tubular pores; vertical cracks 3/4 to 1 1/4 inches apart that have patchy dark gray (10YR 4/1) stains; few fine concretions of iron and manganese oxides; neutral.

The soil ranges from slightly acid to moderately alkaline.

The A horizon has value of 3 and chroma of 1 or 2. It typically is loam, although the range includes clay loam and sandy loam.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y; value of 4 to 6; and chroma of 2 or less. Faint to prominent mottles are in most pedons. The Cg horizon is sandy clay loam, clay loam, or sandy loam.

Goss Series

The Goss series consists of deep, well drained, cherty soils on uplands. These soils are moderately permeable. They formed in clayey residuum of limestone. Slopes range from 9 to 40 percent.

Goss soils commonly are adjacent to Loring and Memphis soils. Loring soils do not have chert and have a brittle subsoil. Memphis soils do not have chert and have less clay in the subsoil. These soils are in higher positions than Goss soils.

Typical pedon of Goss cherty silt loam, 14 to 40 percent slopes, 1,150 feet south and 1,700 feet east of the northwest corner of sec. 27, T. 27 N., R. 8 E.

O—1/2 inch to 0; leaves and twigs.
A—0 to 3 inches; very dark grayish brown (10YR 3/2) cherty silt loam; weak fine granular structure; friable; many fine and medium woody roots; few worm channels and casts; 30 percent chert fragments; slightly acid; clear smooth boundary.
BE—3 to 12 inches; yellowish brown (10YR 5/4) very cherty silt loam; moderate fine subangular blocky structure; friable to firm; many fine and medium woody roots and few coarse woody roots; 40 percent chert fragments; very strongly acid; clear smooth boundary.
Bt1—12 to 21 inches; brown (7.5YR 4/4) very cherty silty clay; moderate medium subangular blocky structure; firm; common fine and medium and few coarse woody roots; few faint clay films; 40 percent chert fragments; very strongly acid; gradual boundary.
Bt2—21 to 39 inches; brown (7.5YR 4/4) extremely cherty clay; strong fine and medium subangular blocky structure; firm; few medium and coarse woody roots; 75 percent chert fragments; neutral; gradual boundary.
Bt3—39 to 60 inches; brown (7.5YR 4/4) extremely cherty clay; strong fine and medium subangular blocky structure; firm; few medium and coarse woody roots; 80 percent chert fragments; neutral.

The solum is more than 60 inches thick. The soil is very strongly acid to neutral.

The A horizon has value of 3 or 4 and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. It is very cherty or extremely cherty silty clay and clay.

Kobel Series

The Kobel series consists of deep, poorly drained, very slowly permeable soils on broad, low natural levees and flood plains. These soils formed in clayey alluvium. Slopes range from 0 to 1 percent.

Kobel soils are similar to and commonly are adjacent to Sharkey soils. Sharkey soils have more clay in the B horizon.

Typical pedon of Kobel silty clay loam, 2,700 feet north and 1,400 feet east of the southwest corner of sec. 9, T. 25 N., R. 12 E.

Ap1—0 to 3 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine blocky structure parting to weak fine granular; friable; many fine roots; neutral; abrupt smooth boundary.
Ap2—3 to 6 inches; gray (10YR 5/1) silty clay; many medium prominent strong brown (7.5YR 5/6) mottles; very firm; common fine roots; few fine and very fine tubular pores; slightly acid; abrupt smooth boundary.
Bg1—6 to 15 inches; gray (10YR 5/1) silty clay; many medium prominent strong brown (7.5YR 5/6) and reddish brown (5YR 4/4) mottles; weak fine and medium subangular blocky structure; firm; many fine roots; many fine and very fine tubular pores; slightly acid; clear smooth boundary.
Bg2—15 to 36 inches; light gray (10YR 6/1) clay; many medium prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; common fine roots; few fine and very fine tubular pores; few slickensides; slightly acid; clear smooth boundary.
Bg3—36 to 52 inches; gray (5Y 5/1) clay; common medium prominent yellowish red (5YR 5/8) mottles; moderate to strong medium subangular blocky structure; firm; few fine roots; common fine and very fine tubular pores; few slickensides; neutral; abrupt smooth boundary.
Bg4—52 to 66 inches; gray (5Y 5/1) clay; many medium prominent reddish brown (5YR 4/4) and strong brown (7.5YR 5/8) mottles; moderate to strong fine subangular blocky structure; firm; few fine roots; common fine and very fine tubular pores; neutral.

Thickness of the solum ranges from 30 to 66 inches or more. Cracks 1/2 to 1 1/4 inches wide and extending to a depth of 20 inches or more are common in most years.

The A horizon has value of 3 and chroma of 2. It ranges from slightly acid to neutral.

The Bg horizon has value of 5 or 6 and chroma of 1. It is silty clay or clay. It ranges from slightly acid to moderately alkaline.

Lilbourn Series

The Lilbourn series consists of deep, somewhat poorly drained, moderately permeable soils on natural levees and low terraces. These soils formed in recent loamy alluvium and older buried alluvium. Slopes range from 0 to 1 percent.

Lilbourn soils commonly are adjacent to Canalou, Dundee, Farrenburg, and Gideon soils. Canalou soils are not as gray and are in slightly higher positions than Lilbourn soils. Dundee soils have more clay in the upper part of the solum, have an argillic horizon, and are in similar positions. Farrenburg soils are not as gray, have an argillic horizon, and are on slightly higher natural levees and terraces. Gideon soils are grayer, have more clay throughout, and are in similar positions as Lilbourn soils.

Typical pedon of Lilbourn fine sandy loam, 1,150 feet west and 1,200 feet north of the southeast corner of sec. 26, T. 25 N., R. 10 E.

Ap—0 to 5 inches; brown (10YR 4/3) fine sandy loam, light yellowish brown (10YR 6/4) dry; moderate fine granular structure; very friable; common fine roots; few fine tubular pores; few small pebbles; medium acid; abrupt smooth boundary.

A—5 to 13 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; few fine roots; few fine pores; few small pebbles; medium acid; clear wavy boundary.

C—13 to 32 inches; light brownish gray (2.5Y 6/2) fine sandy loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; few fine roots; many fine tubular pores; common fine concretions of iron and manganese oxides; medium acid; clear wavy boundary.

2Btb—32 to 49 inches; light brownish gray (2.5Y 6/2) loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; weak fine and medium subangular blocky structure; friable; few fine roots in pores and between peds; many fine pores; few faint dark brown (10YR 3/3) clay films on faces of peds and in pores; common fine concretions of iron and manganese oxides; strongly acid; clear wavy boundary.

2C1—49 to 55 inches; light brownish gray (2.5Y 6/2) loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; very friable; few fine pores; common fine concretions of iron and manganese oxides; medium acid; clear wavy boundary.

2C2—55 to 61 inches; grayish brown (10YR 5/2) sandy loam; common fine strong brown (7.5YR 5/6) mottles; massive; very friable; few fine pores; few fine concretions of iron and manganese oxides; few small pebbles; medium acid.

The thickness of the A and C horizons and the depth to the 2Btb horizon, where present, range from 30 to 46 inches.

The A horizon has value of 3 to 5 and chroma of 2 or 3. It is dominantly fine sandy loam, although it ranges to sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2. It is fine sandy loam, loam, or loamy sand. It ranges from medium acid to neutral.

Loring Series

The Loring series consists of deep, moderately well drained soils on uplands. Permeability is moderately slow. Loring soils formed in loess. Slopes range from 2 to 14 percent.

Loring soils commonly are adjacent to Falaya and Memphis soils. Falaya soils are grayer, do not have brittle layers in the subsoil, and are on adjacent flood plains. Memphis soils do not have brittle layers in the subsoil and are in higher positions than Loring soils.

Typical pedon of Loring silt loam, 5 to 9 percent slopes, eroded, 2,100 feet north and 750 feet west of the southeast corner of sec. 6, T. 25 N., R. 10 E.

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; many fine and very fine roots; many fine and very fine tubular pores; neutral; abrupt smooth boundary.

BA—8 to 16 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky and weak fine granular structure; friable; many fine and very fine roots; many fine tubular pores; common worm channels and casts; slightly acid; gradual smooth boundary.

Bt—16 to 28 inches; yellowish brown (10YR 5/6) silt loam; many medium prominent pale brown (10YR 6/3) mottles in lower 3 inches; moderate fine subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; few light gray (10YR 7/1) silt coats on faces of peds in lower 2 inches; few thin dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; gradual smooth boundary.

Btx1—28 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium prominent light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; firm; brittle; few fine roots; few fine vesicular and many fine and very fine tubular pores; few patchy light gray (10YR 7/1) silt coats on faces of peds; common distinct brown (10YR 5/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

Btx2—40 to 52 inches; dark yellowish brown (10YR 4/4) silt loam; common medium prominent light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; firm; brittle; few fine roots; few fine tubular and many fine and very fine vesicular pores; few light gray (10YR 7/1) silt coats on faces of peds; few faint brown (10YR 5/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

C—52 to 72 inches; dark yellowish brown (10YR 4/4) silt loam; few fine pale brown (10YR 6/3) mottles in upper 4 inches; massive; firm; few fine roots in upper 3 inches; common fine and very fine tubular and few fine vesicular pores; few distinct light gray (10YR 7/1) silt coats and brown (10YR 5/3) clay flows along cracks; strongly acid.

The solum is 45 to 60 inches thick. Depth to the brittle subsoil horizon typically is 20 to 32 inches. The soil is very strongly acid, except where it has been limed.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The BA and Bt horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. They are silt loam or silty clay loam. The Bx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It has gray, brown, or yellowish mottles and is silt loam or silty clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is mottled in shades of gray, brown, or yellow.

Loring soils in Stoddard County do not have the fragipan characteristics that are definitive for the Loring series. This difference does not significantly affect the management of these soils for most uses.

Malden Series

The Malden series consists of deep, excessively drained, rapidly permeable soils on broad slightly convex natural levees. These soils formed in sandy alluvial sediment. Slopes range from 0 to 4 percent.

Malden soils are adjacent to Bosket, Broseley, and Dubbs soils. Bosket and Dubbs soils have more clay. Broseley soils have less sand in the B horizon and have a sandy A horizon only 20 to 40 inches thick. All of these soils are in positions similar to those of the Malden soils.

Typical pedon of Malden loamy sand, 0 to 4 percent slopes, 2,500 feet south and 2,840 feet west of the northeast corner of sec. 10, T. 23 N., R. 10 E.

Ap—0 to 7 inches; dark brown (10YR 3/3) loamy sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many fine and very fine roots; neutral; abrupt smooth boundary.

A—7 to 14 inches; dark yellowish brown (10YR 3/4) loamy sand; moderate thick platy structure; friable; few fine and very fine roots; few fine pores; slightly acid; clear smooth boundary.

Bw1—14 to 25 inches; dark brown (7.5YR 4/4) loamy sand; weak fine subangular blocky structure; friable; few fine and very fine roots; few fine pores; slightly acid; clear smooth boundary.

Bw2—25 to 36 inches; strong brown (7.5YR 4/6) loamy sand; weak fine subangular blocky structure; friable; few fine and very fine roots; few fine pores; slightly acid; clear smooth boundary.

Bw3—36 to 52 inches; dark yellowish brown (10YR 4/6) loamy sand; weak fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

C—52 to 70 inches; dark yellowish brown (10YR 4/4) sand; single grain; very friable; slightly acid.

The solum ranges from 19 to 60 inches in thickness. However, the range commonly is 30 to 54 inches. The soil is slightly acid to strongly acid, except where it has been limed or irrigated.

The A horizon has hue of 10YR or 7.5YR, value of 3, and chroma of 3 or 4. It typically is loamy sand or sand, although the range includes loamy fine sand.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is loamy sand or loamy fine sand.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is fine sand or sand.

Malden sand, 0 to 4 percent slopes, has more gravel in the B and C horizons than is definitive for the Malden series. This difference does not significantly affect the management of the soil for most uses.

Memphis Series

The Memphis series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in thick loess. Slopes range from 5 to 40 percent.

Memphis soils are adjacent to Brandon, Falaya, and Loring soils. Brandon soils have a gravelly layer within 40 inches of the surface and are in lower positions. Falaya soils have a grayer B horizon and are on adjacent flood plains. Loring soils have a mottled, brittle B horizon and typically are in lower positions than the Memphis soils.

Typical pedon of Memphis silt loam, 5 to 9 percent slopes, eroded, 2,400 feet south and 50 feet east of the northwest corner of sec. 28, T. 26 N., R. 11 E.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silt loam, very pale brown (10YR 7/3) dry; weak fine and very fine granular structure; friable; many fine and very fine roots; common fine and very fine pores; slightly acid; abrupt smooth boundary.

BA—6 to 12 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular and weak fine and medium subangular blocky structure; friable; many fine and very fine roots; few fine vesicular pores; many fine and very fine tubular pores; many worm channels and casts; medium acid; clear smooth boundary.

Bt1—12 to 19 inches; dark yellowish brown (10YR 4/6) silt loam; weak fine subangular blocky structure; friable; common fine and very fine roots; common fine vesicular pores; many fine and very fine tubular pores; few worm channels and casts; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—19 to 38 inches; dark yellowish brown (10YR 4/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; common fine and very fine tubular pores; few fine vesicular pores; few patchy light gray (10YR 7/1) silt coats between structural faces; few black stains on faces of peds; few faint brown (10YR 4/3) clay films; very strongly acid; gradual smooth boundary.

Bt3—38 to 58 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; firm; few fine and very fine roots; few fine and very fine tubular pores; few fine vesicular pores; patchy light gray silt coats on peds in lower 5 inches; common distinct brown (10YR 4/3) clay films in upper 15 inches; very strongly acid; gradual smooth boundary.

Bt4—58 to 72 inches; dark yellowish brown (10YR 4/6) silt loam; few fine prominent gray (10YR 6/1) and light grayish brown (10YR 6/2) mottles; weak fine and medium subangular blocky structure; firm; few fine and medium roots; common fine and very fine discontinuous tubular pores; few fine vesicular pores; few light gray (10YR 7/1) silt coats; few faint brown (10YR 4/3) clay films; very strongly acid.

The solum is 40 to 72 or more inches thick. The soil ranges from medium acid to very strongly acid, except where it has been limed.

The A horizon has value of 3 to 5 and chroma of 2 to 4. Where the A horizon has value of 3 and chroma of 2 or 3, it is less than 6 inches thick.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam.

The C horizon, where present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6.

Mhoon Series

The Mhoon series consists of deep, poorly drained, slowly permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 1 percent.

Mhoon soils commonly are adjacent to Commerce, Roellen, and Sharkey soils. Commerce soils commonly have chroma of 2 in the subsoil and are in slightly higher positions. Roellen soils have a mollic epipedon, are more than 35 percent clay in the B horizon, and are in slightly lower positions. Sharkey soils are more than 60 percent clay in the B horizon and are in slightly lower positions than Mhoon soils.

Typical pedon of Mhoon silt loam, 1,700 feet east and 50 feet south of the northwest corner of sec. 23, T. 25 N., R. 12 E.

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; light gray (10YR 7/2) dry; moderate fine and medium granular structure; friable; common to many fine and medium roots; neutral; abrupt smooth boundary.

Ap2—4 to 11 inches; dark brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak coarse subangular blocky structure; firm; few fine and medium roots; neutral; abrupt smooth boundary.

Bg1—11 to 16 inches; light gray (10YR 6/1) silt loam; many medium and coarse strong brown (7.5YR 5/8) and reddish yellow (7.5YR 6/8) mottles; weak coarse subangular blocky structure; firm; few fine and medium roots; common fine and many very fine tubular pores; many medium and fine concretions of iron and manganese oxides; neutral; abrupt smooth boundary.

Bg2—16 to 30 inches; light gray (10YR 6/1) silty clay loam; many medium strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; firm; many fine and very fine tubular pores; few fine and medium concretions of iron and manganese oxides; medium acid; gradual smooth boundary.

Bg3—30 to 46 inches; light gray (10YR 6/1) silty clay loam; many medium strong brown (7.5YR 4/6) mottles; weak and moderate fine subangular blocky structure; firm; common fine and many very fine tubular pores; many medium concretions of iron and manganese oxides; neutral; gradual smooth boundary.

Cg1—46 to 58 inches; light gray (10YR 6/1) silty clay loam; many medium strong brown (7.5YR 5/6-5/8) mottles; massive; firm; common fine and very fine tubular pores; many fine and medium concretions of iron and manganese oxides; neutral; gradual smooth boundary.

Cg2—58 to 72 inches; light gray (10YR 6/1) and light brownish gray (10YR 6/2) silt loam; many coarse strong brown (7.5YR 5/6-5/8) mottles; massive; firm; common fine and very fine tubular pores; many concretions of iron and manganese oxides; neutral.

Thickness of the solum ranges from 36 to 50 inches.

The A horizon has value of 3 or 4 and chroma of 1 or 2. It ranges from slightly acid to mildly alkaline.

The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silt loam or silty clay loam. It is slightly acid to moderately alkaline.

The C horizon is similar in color, texture, and reaction to the B horizon.

Roellen Series

The Roellen series consists of deep, poorly drained, slowly permeable soils on flood plains. These soils formed in clayey slackwater alluvium. Slopes range from 0 to 2 percent.

Roellen soils commonly are adjacent to Allemands, Commerce, and Mhoon soils. Allemands soils have an organic surface layer, do not have a B horizon, and are in slightly lower positions. Commerce soils have less clay and dominantly have chroma of 2 in the B horizon. Mhoon soils do not have a mollic epipedon and dominantly have chroma of 1 in the B horizon.

Commerce soils are in higher positions than Roellen soils, and Mhoon soils are in slightly lower positions.

Typical pedon of Roellen silty clay loam, 3,350 feet north and 100 feet west of the southeast corner of sec. 2, T. 27 N., R. 11 E.

Ap—0 to 3 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; strong fine granular structure; friable; many fine and medium roots; neutral; abrupt smooth boundary.

A—3 to 12 inches; black (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; moderate coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; many fine and very fine roots; neutral; clear smooth boundary.

Bg1—12 to 23 inches; dark gray (10YR 4/1) silty clay; common coarse prominent olive (5Y 5/6) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; sticky and plastic; common fine and very fine roots; neutral; clear smooth boundary.

Bg2—23 to 38 inches; dark gray (10YR 4/1) and light olive gray (5Y 6/2) clay; many coarse prominent yellowish red (5YR 5/8), strong brown (7.5YR 5/8), and brownish yellow (10YR 6/6) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; sticky and plastic; few fine and very fine herbaceous roots and few fine and medium woody roots; neutral; gradual smooth boundary.

Cg1—38 to 46 inches; greenish gray (5BG 5/1) clay loam; common medium prominent olive (5Y 5/6-5/8) mottles; weak fine and medium subangular blocky structure; slightly sticky and plastic; common fine and medium dead woody roots; few pieces of cypress limbs and roots; mildly alkaline; gradual boundary.

Cg2—46 to 61 inches; greenish gray (5GY 5/1) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; sticky and plastic; many medium black (10YR 2/1) soft iron and manganese masses; mildly alkaline.

The soil commonly is neutral to mildly alkaline throughout. Thickness of the mollic epipedon ranges from 10 to 28 inches.

The A horizon has value of 3 and chroma of 1 or 2. The Ap horizon is dominantly silty clay loam, although it ranges to clay loam.

The Bg horizon has hue of 10YR, 5Y, or 2.5Y; value of 4 or 5; and chroma of 1 or 2. Many pedons are neutral in hue, have value of 4 or 5, and have dark stains along cracks. Slickensides and polished ped faces are few to common in the B horizon. The Bg horizon is silty clay or clay and averages 40 to 55 percent clay. Mottles in the Bg horizon are in shades of red, brown, or olive.

The C horizon has hue of 10YR, 5GY, 5BG, or is neutral; value of 4 or 5; and chroma of 1 or 2. It is clay loam, silt loam, silty clay loam, or silty clay.

Shadygrove Series

The Shadygrove series consists of deep, moderately well drained, slowly permeable soils on upland coastal plains. These soils formed in clayey fossiliferous sediment of marine origin. Slopes range from 5 to 9 percent.

Shadygrove soils commonly are adjacent to Eustis and Roellen soils. Eustis soils are sandy throughout and are in higher positions. Roellen soils have a mollic epipedon, do not have an argillic horizon, and are on flood plains in lower positions than Shadygrove soils.

Typical pedon of Shadygrove loam, 5 to 9 percent slopes, eroded, 1,100 feet west and 150 feet south of the northeast corner of sec. 10, T. 27 N., R. 11 E.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure breaking to moderate fine and medium granular; friable; common fine and medium herbaceous roots; 5 to 10 percent gravel; strongly acid; abrupt smooth boundary.

Bt1—5 to 15 inches; dark yellowish brown (10YR 4/4) clay loam; weak and moderate fine and medium subangular blocky structure; friable to firm; common fine and medium herbaceous roots; common fine tubular pores; many mica flakes; 10 percent gravel; very strongly acid; clear smooth boundary.

Bt2—15 to 24 inches; dark yellowish brown (10YR 4/4) clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; common fine and medium herbaceous roots; common fine tubular pores; many mica flakes; very strongly acid; clear smooth boundary.

Bt3—24 to 32 inches; brown (10YR 5/3) clay loam; strong fine subangular blocky structure; firm; common fine herbaceous roots; common fine tubular pores; many mica flakes; very strongly acid; gradual smooth boundary.

Bt4—32 to 44 inches; light brownish gray (2.5Y 6/2) and light yellowish brown (2.5Y 6/3) clay loam; many medium and coarse prominent strong brown (7.5YR 5/8) mottles; strong fine subangular blocky structure; firm; common fine herbaceous and woody roots; few fine tubular pores; many mica flakes; very strongly acid; gradual smooth boundary.

Bt5—44 to 60 inches; grayish brown (2.5Y 5/2) and light brownish gray (2.5Y 6/2) clay loam; many coarse strong brown (7.5YR 4/6) mottles; strong fine and medium subangular blocky structure; firm; few fine woody roots; few fine and medium tubular pores; many mica flakes; strongly acid.

The solum is 40 to more than 60 inches thick. The soil is very strongly acid or strongly acid throughout, except where it has been limed.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 6. Some pedons have buried horizons that have value of 3 or 4 and chroma of 2 or 3.

The C horizon, where present, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4.

Sharkey Series

The Sharkey series consists of deep, poorly drained, very slowly permeable soils in broad depressional areas on flood plains. These soils formed in clayey alluvium. Slopes range from 0 to 1 percent.

Sharkey soils are similar to Kobel soils and commonly are adjacent to Commerce and Roellen soils. Kobel soils are 40 to 60 percent clay in the 10- to 40-inch control section. Commerce soils typically are in slightly higher positions and have less clay in the B horizon. Roellen soils have a mollic epipedon 10 to 28 inches thick, are 40 to 60 percent clay in the B horizon, and are in slightly higher positions.

Typical pedon of Sharkey silty clay loam, 4,200 feet east and 100 feet north of the southwest corner of sec. 1, T. 24 N., R. 12 E.

Ap1—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; firm; many fine and very fine roots; few fine pores; few fine pieces of charcoal; neutral; abrupt smooth boundary.

Ap2—6 to 10 inches; dark grayish brown (10YR 4/2) clay; few fine prominent strong brown (7.5YR 5/8) mottles in lower part; weak fine subangular blocky structure; firm; many fine and very fine roots; few fine pores; neutral; abrupt smooth boundary.

Bg1—10 to 25 inches; gray (10YR 5/1) clay; many fine prominent strong brown (7.5YR 5/8) mottles; strong fine subangular blocky structure; firm; common fine and very fine roots; many fine and very fine pores; shiny pressure faces on peds; moderately alkaline; clear smooth boundary.

Bg2—25 to 31 inches; gray (10YR 5/1) clay; many fine prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; common fine and very fine roots; many fine and very fine pores; shiny pressure faces on peds; moderately alkaline; gradual smooth boundary.

Bg3—31 to 45 inches; gray (10YR 5/1) clay; many fine and coarse prominent strong brown (7.5YR 5/6) mottles and few fine prominent strong brown (7.5YR 4/6) mottles; moderate fine subangular blocky structure; firm; common fine and very fine roots; many fine and very fine pores; few fine and very fine soft iron and manganese masses; shiny pressure faces on peds; moderately alkaline; gradual smooth boundary.

Bg4—45 to 56 inches; gray (10YR 6/1) clay; many fine and medium prominent strong brown (7.5YR 5/6) mottles; moderate fine subangular blocky structure; firm; common fine and very fine roots; many fine and very fine pores; common fine and very fine soft iron and manganese masses; shiny pressure faces on peds; moderately alkaline; clear smooth boundary.

C—56 to 72 inches; gray (10YR 6/1) clay; few fine prominent strong brown (7.5YR 5/6) mottles; massive; firm; common fine tree roots; many fine and very fine pores; few fine white (10YR 8/1) calcium deposits throughout; moderately alkaline.

The solum ranges from 40 to 60 inches in thickness. Cracks extend into the Bg horizon when the soil is dry.

The Ap horizon has value of 3 or 4 and chroma of 1 or 2. It is silty clay loam or silty clay. The Ap horizon is slightly acid to mildly alkaline.

The Bg horizon has hue of 10YR or 5Y, value of 4 or 5, and chroma of 1. The content of clay averages more than 60 percent. The Bg horizon is medium acid to moderately alkaline.

Sikeston Series

The Sikeston series consists of deep, poorly drained, moderately slowly permeable soils in abandoned channels and sunken lowlands on flood plains. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent.

Sikeston soils are adjacent to Bosket and Mhoon soils. Bosket soils have an argillic horizon and are at higher elevations. Mhoon soils have less sand and commonly are in broader depressional areas.

Typical pedon of Sikeston loam, 150 feet west and 100 feet north of the southeast corner of sec. 11, T. 23 N., R. 9 E.

Ap—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, gray (10YR 5/1) dry; strong fine granular structure; friable; common fine roots; slightly acid; abrupt smooth boundary.

A1—4 to 14 inches; very dark gray (10YR 3/1) loam; weak coarse subangular blocky structure; firm; common fine roots; neutral; clear smooth boundary.

A2—14 to 27 inches; very dark gray (10YR 3/1) clay loam; weak to moderate fine and medium subangular blocky structure; firm; few fine roots; neutral; gradual wavy boundary.

AC—27 to 38 inches; dark gray (5Y 4/1) clay loam; few fine distinct olive (5Y 5/4) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; common very dark gray (10YR 3/1) stains on major structural faces; neutral; gradual wavy boundary.

Cg—38 to 60 inches; dark gray (5Y 4/1) loam; few fine olive (5Y 5/4) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and medium calcium nodules throughout; mildly alkaline.

The mollic epipedon is 24 to 48 inches thick. The soil typically is neutral, although it ranges from slightly acid to mildly alkaline. Some pedons have a sandy 2C horizon at a depth of 33 to 49 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Ap horizon typically is loam, although it ranges to sandy clay loam, clay loam, and sandy loam. The AC horizon has hue of 10YR, 2.5Y, or 5Y; value of 4 or 5; and chroma of 1 or 2. It is sandy clay loam, clay loam, or sandy loam.

The C and 2C horizons have hue of 5Y, 2.5Y, or 10YR; value of 4 or 5; and chroma of 1 or 2. They are sandy loam, sandy clay loam, or loam.

Tuckerman Series

The Tuckerman series consists of deep, poorly drained, moderately slowly permeable soils on natural levees. Slopes range from 0 to 1 percent.

Tuckerman soils commonly are adjacent to Amagon, Gideon, Lilbourn, and Sharkey soils in the landscape. Amagon soils have less sand and Sharkey soils are very fine; these soils are in lower positions than Tuckerman soils. Gideon soils have a dark surface layer more than 6 inches thick; and Lilbourn soils have less clay. Gideon and Lilbourn soils commonly are in former drainageways at similar or slightly lower elevations than Tuckerman soils.

Typical pedon of Tuckerman fine sandy loam, 2,500 feet east and 500 feet north of the southwest corner of sec. 24, T. 24 N., R. 12 E.

Ap1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

Ap2—5 to 9 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; medium acid; abrupt smooth boundary.

BAg—9 to 19 inches; gray (10YR 6/1) loam; common fine prominent yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; few medium concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Btg—19 to 38 inches; gray (10YR 6/1) sandy clay loam; common coarse prominent yellowish red (5YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; common fine roots; many fine tubular pores; common faint clay films on faces of peds and in pores; few fine concretions of iron and manganese oxides; very strongly acid; clear wavy boundary.

C—38 to 60 inches; light brownish gray (10YR 6/2) loamy fine sand; many medium and few coarse prominent (7.5YR 5/6) mottles; loose; few fine concretions of iron and manganese oxides; strongly acid.

The solum is 36 to more than 60 inches thick. The soil ranges from medium acid to very strongly acid, except where it has been limed.

The A horizon has value of 4 or 5 and chroma of 2. It typically is fine sandy loam, although it ranges to loam.

The Bt horizon has value of 4 and chroma of 1 or value of 6 and chroma of 2. It is loam or sandy clay loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loamy fine sand.

Wardell Series

The Wardell series consists of deep, poorly drained, slowly permeable soils on low natural levees. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent.

Wardell soils are similar to Gideon soils and commonly are adjacent to Gideon, Lilbourn, and Sharkey soils. Gideon soils do not have an argillic horizon and Sharkey soils have much more clay. These soils are in positions similar to those of the Wardell soils. Lilbourn soils have less clay and are also in similar positions.

Typical pedon of Wardell loam, about 1,425 feet south and 2,600 feet east of the northwest corner of sec. 7, T. 24 N., R. 11 E.

Ap1—0 to 3 inches; dark brown (10YR 3/3) loam, grayish brown (10YR 5/2) and brown (10YR 5/3) dry; moderate fine and medium granular structure; friable; neutral; abrupt smooth boundary.

Ap2—3 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; massive; firm; plowpan, slightly acid; abrupt smooth boundary.

BA—9 to 18 inches; light brownish gray (10YR 6/2) loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; common fine and very fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg1—18 to 32 inches; light gray (10YR 6/1) loam; many medium prominent brown (7.5YR 4/4) mottles; weak to moderate fine and medium subangular blocky structure; firm; many fine and very fine tubular pores; common fine and medium vesicular pores; few faint clay films in pores and on faces of peds; many fine concretions of iron and manganese oxides; very strongly acid; gradual smooth boundary.

Btg2—32 to 48 inches; light gray (10YR 6/1) clay loam; many medium prominent strong brown (7.5YR 4/6-5/6) mottles; weak to moderate medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; many fine and very fine tubular pores; few faint clay films in pores and on faces of peds; few fine concretions of iron and manganese oxides; very strongly acid; abrupt smooth boundary.

Cg1—48 to 54 inches; light gray (10YR 6/1) clay loam; many medium and coarse prominent strong brown (7.5YR 5/6) mottles; massive breaking to weak medium and coarse subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; medium acid; clear smooth boundary.

Cg2—54 to 62 inches; light gray (10YR 6/1) sandy loam; many coarse prominent dark brown (7.5YR 4/4) mottles; massive; firm; common fine and very fine tubular pores; slightly acid.

The solum is 40 to 50 or more inches thick.

The A horizon has value of 3 and chroma of 1 to 3. It dominantly is loam, although it ranges from fine sandy loam to sandy clay loam. The A horizon is medium acid to slightly acid, except where it has been limed.

The B horizon has hue of 10YR, 2.5Y, or 5Y; value of 6; and chroma of 1 or 2. It commonly is clay loam, although it ranges to sandy loam or loam. The Bt horizon has brownish or grayish mottles. It is very strongly acid to slightly acid.

The C horizon has hue of 10YR, 2.5Y, or 5Y; value of 4 to 7; and chroma of 1 or 2.

Waverly Series

The Waverly series consists of deep, poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Waverly soils are similar to Falaya soils and commonly are adjacent to Amagon, Dundee, and Falaya soils. Amagon and Dundee soils have an argillic horizon and are in positions similar to those of the Waverly soils. Falaya soils are browner in part of the solum.

Typical pedon of Waverly silt loam, 2,700 feet north and 1,300 feet west of the southeast corner of sec. 27, T. 26 N., R. 11 E.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine roots; few fine and medium concretions of iron and manganese oxides; slightly acid; abrupt smooth boundary.

Bg1—8 to 15 inches; light gray (10YR 6/1) silt loam; weak fine subangular blocky structure; firm; common fine roots; many fine pores; common fine and medium concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Bg2—15 to 31 inches; light gray (10YR 6/1) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; firm; common fine vesicular pores; common fine and medium concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Bg3—31 to 44 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; firm; common fine and medium concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

Cg—44 to 63 inches; light gray (10YR 6/1) silt loam; many medium and coarse prominent dark yellowish brown (10YR 4/4) mottles; massive; firm; many fine and medium concretions of iron and manganese oxides; slightly acid.

The solum ranges from about 30 to 50 inches in thickness. The soil is strongly acid or very strongly acid, except where it has been limed.

The A horizon has value of 4 to 6 and chroma of 2 to 4. It typically is silt loam, although it ranges to silt.

The B horizon has hue of 10YR, 2.5Y, or 5Y; value of 4 to 7; and chroma of 1, or value of 6 or 7 and chroma of 1 or 2. It is silt or silt loam.

The C horizon has colors similar to the B horizon.

Zachary Series

The Zachary series consists of deep, poorly drained, slowly permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 1 percent.

Zachary soils commonly are adjacent to Calhoun, Crowley, and Falaya soils. Calhoun soils have gray silty material extending into the B horizon and are in similar positions. Crowley soils typically are on slightly higher terraces and are more than 35 percent clay in the B horizon. Falaya soils are on more recent flood plains and do not have an argillic horizon.

Typical pedon of Zachary silt loam, 2,600 feet east and 150 feet north of the southwest corner of sec. 34, T. 26 N., R. 9 E.

Ap1—0 to 5 inches; dark brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Eg1—5 to 9 inches; light gray (10YR 6/1) and light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure parting to weak fine subangular blocky; firm; common fine roots; many fine and very fine tubular pores; neutral; abrupt smooth boundary.

Eg2—9 to 15 inches; light gray (10YR 6/1) and light brownish gray (10YR 6/2) silt loam; many coarse prominent dark yellowish brown (10YR 4/4) mottles; weak thin and medium platy structure; firm; common fine roots; many fine and very fine tubular pores and many fine and medium vesicular pores; few fine concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Eg3—15 to 20 inches; light brownish gray (10YR 6/2) silt loam; many medium faint grayish brown (10YR 5/2) and prominent yellowish brown (10YR 5/4) mottles; weak fine and medium subangular blocky structure; firm; common fine roots; many fine and very fine tubular pores; common fine and medium vesicular pores; few fine concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Eg4—20 to 31 inches; light gray (10YR 6/1) and light brownish gray (10YR 6/2) silt loam; many medium prominent dark yellowish brown (10YR 4/4) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; common fine and medium vesicular pores; common fine concretions of iron and manganese oxides; very strongly acid; abrupt smooth boundary.

Btg1—31 to 41 inches; light brownish gray (10YR 6/2) and light gray (10YR 6/1) silty clay loam; many coarse prominent dark yellowish brown (10YR 4/4) mottles; weak to moderate fine subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; many fine and medium vesicular pores; few faint clay films on faces of peds; common fine concretions of iron and manganese oxides; strongly acid; clear smooth boundary.

Btg2—41 to 54 inches; light brownish gray (10YR 6/2) silty clay loam; many medium prominent strong brown (7.5YR 4/6) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; many fine and very fine tubular pores; few to common fine and medium vesicular pores; few faint clay films on faces of peds; common fine and medium concretions of iron and manganese oxides; very strongly acid; clear smooth boundary.

Btg3—54 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine and medium prominent dark yellowish brown (10YR 4/6) and brown (10YR 5/3) mottles; moderate fine subangular blocky structure; firm; common fine and very fine tubular pores; few faint clay films on faces of peds; common fine and medium concretions of iron and manganese oxides; very strongly acid.

The solum ranges from 50 to 60 or more inches in thickness. Thickness of the A and E horizons and depth to the Bt horizon is 24 to 39 inches.

The A, or Ap, horizon has value of 4 or 5 and chroma of 1 or 2. It ranges from very strongly acid to neutral.

The Eg horizon has value of 6 or 7 and chroma of 1 or 2. It ranges from very strongly acid to medium acid.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It ranges from very strongly acid to medium acid.

Formation of the Soils

Soils are continually changing: organic materials accumulate and decompose; nutrients are cycled and leached; minerals weather; and clay washes downward in the soil. With sufficient time these processes develop distinct layers or horizons in different soils. This section describes how some of these factors have affected the soils in Stoddard County.

Factors of Soil Formation

The formation of soils is influenced by the interaction of many complex environmental factors. Some of these factors are poorly understood, but the five major ones are: (1) parent material, (2) relief, or lay of the land, (3) climate, (4) living organisms, and (5) time.

Parent Material

Parent material is the original mineral and organic mass from which a soil forms. Certain properties of the parent material, such as its chemistry, mineralogy, and texture, exert strong influences on the soil that formed. For example, if the original material is loamy, then the texture of the developed soil will also tend to be loamy, as in the Bosket and Farrenburg soils. If the original parent material is high in natural fertility, then the developed soil is often high in natural fertility, as in the Collins and Roellen soils.

The parent materials of soils in Stoddard County are of two main kinds: (1) alluvial sediments deposited by water and (2) loessal sediments deposited by wind. In some places soils have formed in deposits that consist of both alluvial and loessal sediments.

About 75 percent of the soils in the county have formed in alluvial parent materials deposited by former streams. These sediments vary in texture from sandy and gravelly to clayey. The coarser sandy sediments, in which Malden and Canalou soils formed, were deposited on natural levees and alluvial fans by relatively swift floodwaters. Silty and loamy sediments, in which Amagon, Bosket, Commerce, Dubbs, and Gideon soils formed, were deposited by waters that had moderate velocities. The finer clayey sediments, in which Forestdale, Roellen, and Sharkey soils formed were deposited in swampy sloughs and basins by sluggish waters.

Some of the soils on the flood plain west of Crowley's Ridge have formed in silty parent materials deposited by moderate floodwaters of the Mississippi, St. Francis, and Castor Rivers. Other features of some of these parent materials, such as uniformity, absence of stratification, and location indicate a possible windblown origin.

On the flood plain east of Crowley's Ridge the deposition of parent materials was much more complex. First, varied deposits of sandy, loamy, and clayey sediments were laid down by a shallow, braided stream system of the Mississippi and Ohio Rivers. Then, during the past few thousand years or so, these sediments were reworked and added to by floodwaters of the Mississippi River and local streams (*10, 21, 22*). This left diverse parent materials with many differences in texture, reaction, and fertility. Canalou, Dundee, Lilbourn, Malden, and Sharkey soils are some of the soils that formed in these highly variable sediments.

Other alluvial parent materials have been deposited both on the bottoms and on the hills of the Crowley's Ridge upland area. Sediments high in silt content have been eroded from the hills and deposited on the adjacent bottoms. Falaya and Collins soils formed in these deposits. On many of the higher, narrower hills a gravelly sediment was deposited by an ancient stream system. Later, it was extensively eroded and then blanketed by a thin layer of silty loess. Brandon soils formed in these dissimilar sediments.

On the east edge of Crowley's Ridge soils have formed in several alluvial parent materials deposited on the ancient Gulf Coastal Plain. These are mostly sandy, gravelly, loamy, and clayey sediments that were deposited in ancient seas, inland lakes, and flood plains (*9, 11, 6*). The Eustis and Shadygrove soils have formed in these old sediments. Eustis soils have formed in the Wilcox Sand, a Tertiary deposit. Shadygrove soils have formed in colluvium derived mainly from the Porter's Creek Clay, also a Tertiary deposit. Numerous inclusions in the Eustis-Memphis Complex have been derived from admixtures of loess, Wilcox Sand and clay bodies, Lafayette Gravel, and other old Tertiary and Cretaceous sediments.

The silty, loessal parent materials blanket most of the Crowley's Ridge upland. These deposits range from a few inches to as much as 68 feet thick, but they average between 5 and 8 feet thick (*9*). Loring soils formed where a few feet of younger loess overlie a slightly different, older loess. Memphis soils formed in the deeper deposits of the youngest loess. In the western part of the county near Asherville, sandy and loamy windblown sediments were deposited on several hills and side slopes. Wind erosion of alluvium on nearby outwash plains during the Wisconsinan glacial period was the source of these windblown sediments (*10, 22, 23*).

Relief

The relief, or lay of the land, greatly affects soil formation by modifying other soil-forming factors. Differences in the height, shape, and steepness of the land influence the effects of both climate and living organisms.

The relative heights and shapes of land surfaces strongly affect the occurrence and movement of water on and in different soils. In low depressional areas soils tend to be wetter, grayer, and colder and have less intense physical and chemical activity. Roellen and Sharkey are weakly developed soils that formed in such low depressional areas. The organic Allemands soil formed in an old depressional wetland that was ponded for about 9,000 years. Here, a high water table provided a relatively stable low-oxygen environment where marsh and swamp plants accumulated in deposits up to 6 or more feet thick (*13*).

On slightly higher positions of alluvial flats and natural levees, water drains off and through soils better. There is more chemical and physical activity because of increased aeration, higher soil temperature, and alternate wetting and drying. Crowley, Dundee, and Farrenburg soils are some of the soils that formed on these intermediate positions.

The highest positions on convex natural levees and hills have the best surface and internal drainage. Soils that form on these landscape positions are usually several feet above the water table. Excess water drains more freely off and through these soils, producing good aeration and brown soil colors. Leaching, translocation of clay, weathering of minerals, and other processes are highly active. Bosket, Dubbs, and Memphis soils formed on such well-drained landscape positions.

Steepness of slope mainly influences soil formation by its effect on erosion and runoff. On steeper slopes erosion tends to be greater and less water may move through and leach the soils. This often causes these soils to be less developed and thinner than the same soils on more gentle slopes (*26, 4*).

Climate

In many soils climate is the most influential factor in soil formation. Temperature and the amount and distribution of precipitation strongly affect the intensity of biological, chemical, and physical processes; these processes largely control soil development. Hence, with sufficient time, climate tends to eventually dominate soil formation (*4*).

During the last 20,000 or so years several different climates have influenced soil formation in the area that is now Stoddard County. A humid temperate climate has prevailed for about the last 5,000 years. A warmer and much drier climate existed here about 5,000 to 8,700 years ago (*13*). A brief period of temperate climate was preceded by a much colder climate during the Wisconsinan glacial period about 8,700 to 20,000 years ago (*12*).

The humid temperate climates have been favorable to relatively rapid soil formation. Warm temperatures and plentiful precipitation create conditions favorable to a hardwood forest ecosystem in which most of the soils in the county formed. This ecosystem fosters: (1) a tie-up of organic matter and nutrients in woody plants and rapid decay of the leaves, stems, and other organic materials, (2) rapid leaching of bases, (3) elluviation and formation of clay, and (4) weathering of feldspars and other minerals (*16, 28*).

During the warmer and much drier climate that occurred about 5,000 to 8,700 years ago, a grassland or even more arid ecosystem may have existed (*13*). In fact, archaeological evidence in northeast Arkansas indicates that the climate during part of this time period may have been so adverse that it caused the Indians to abandon this area for a few thousand years (*23*). In this environment, grasses and other herbaceous plants were more abundant, and there was less leaching, chemical weathering, and clay elluviation. Accordingly, this period of warmer and drier climate slowed the formation of many of the soils that were here at that time.

Near the end of the last glacial period, about 12,000 to 20,000 years ago, the climate in the area was much colder than it is today. Under this climate an extensive coniferous forest dominated by pine and spruce trees covered most of the United States (*12, 29*). This coniferous forest increased soil acidity and the leaching of bases such as calcium, magnesium, and potassium (*4, 16*). The much colder temperatures slowed chemical reactions and increased frost heaving, soil creep and other processes typical in cold climates. In Stoddard County, only the older soils on Crowley's Ridge and in the lowland west and north of Crowley's Ridge were being formed during this glacial period (*30*). Soils in these areas, such as the Brandon, Calhoun, Crowley, and Loring soils, are more acid and leached and have had more clay translocation and other changes than the younger soils have had.

Living Organisms

Many plants and animals play a significant role in the formation of soils. Accumulation and decomposition of organic matter, profile mixing, nutrient cycling, and numerous other processes are made possible by soil organisms.

Prior to settlement of the county, the native plant communities affected soil formation in many ways. The formerly extensive forests firmly anchored the soils and held surface erosion to a minimum. As countless tree roots branched out and died, they created many pores and channels for the passage of water, air, translocated clay, leachates, and other roots. The thick spongelike litter that used to cover the forest floor absorbed much of the rainfall. This, too, helped hold erosion to a minimum and increased the leaching of bases and the translocation of clay.

Several of the former sloughs and swamps of the county had an environment that fostered the accumulation of organic matter. The remains of water-loving plants such as bald cypress, sedges, rushes, and water grasses were added to mineral soil as it was deposited. Allemands, Roellen, and Sikeston soils formed in these wet, low-oxygen environments.

Other, less conspicuous organisms affect soil formation in numerous other ways. Animals such as moles, mice, shrews, crayfish, insects, earthworms, and millipeds mix and tunnel the soil and break down plant litter into forms readily decomposed by microbes. These microbes, especially bacteria and fungi, are also important in mineral decay, nutrient cycling and availability, and soil aggregation. These and many other effects of organisms contribute greatly to the productive capacity and development of soils (*4, 20*).

For many decades now, the actions of man have had the greatest impact on the formation of the soils in Stoddard County. Drainage ditches, levees, and dams have lowered the water table, reduced flooding, and turned thousands of acres of former swampy or wet bottom land into productive farmland. Land grading and excavation have in places created completely new soils and changed the surface layer on many thousands of acres. The addition of lime, fertilizer, and pesticides has changed soils both chemically and biologically. Heavy farm machinery and other equipment have compacted the upper soil layers. Cultivation has often reduced the organic matter, deteriorated the tilth, depleted the nutrients, and accelerated erosion. On much of Crowley's Ridge this increased erosion has completely removed some of the upper soil layers and significantly reduced the productive capacity of the soils.

Time

The alteration of parent materials by soil-forming processes takes time. With the passage of time, different layers or horizons form and then often evolve into other kinds of horizons. For example, after a few hundred years, weathering, leaching, and other alterations develop a weak cambic horizon in many young alluvial materials. After a few thousand years, continued leaching, translocation of clay, and other changes may eventually transform the cambic horizon into a clay-enriched argillic horizon. With more time and further alteration, clay, oxides, and nutrients move still deeper and change upper parts of the argillic horizon into a light-colored elluvial horizon (*5, 28*).

The soils in Stoddard County show a wide range in age and amount of alteration. Some, such as the younger Collins and Falaya soils, have only weakly developed soil horizons that are much like the original parent materials. In the older soils, such as the Brandon, Crowley, and Goss soils, there has been considerable leaching, translocation of clay, and other changes that have created distinct horizons. Most of the soils in the county have fairly distinct horizons, but they tend to have had only moderate degrees of weathering, clay translocation, leaching, and other changes. Askew, Bosket, Canalou, and Sharkey soils are some of these soils.

Geologically, all of the soils in Stoddard County are young. East of Crowley's Ridge most of the soils formed in sediments deposited in the last 12,000 or so years. Most of the loessal soils on Crowley's Ridge and most of the alluvial soils west of Crowley's Ridge are believed to be between 12,000 and 50,000 years old (*22*).

The maturity of a soil, as expressed by profile development however, is not necessarily a reflection of time in years. Rather, it is the result of the interaction of the various soil-forming factors over periods of time. Climate, living organisms, relief, and other factors dynamically interact and alter parent materials over time to form soils (*7*). Much evidence indicates that these factors have varied considerably during the past several thousand years, and the soils in Stoddard County reflect a rich diversity of soil origins, soil histories, and soil types.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

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; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, 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 classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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 water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excessive silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green-manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, alluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overyling horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon. —Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

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

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber. Page start for tables - 107

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1961-79 at Dexter, Mo.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F		In	In	In		In
January----	42.6	24.6	33.6	69	-4	17	3.73	1.70	5.46	6	3.8
February---	48.3	28.6	38.5	73	4	22	3.45	1.91	4.80	6	2.8
March------	59.7	38.5	49.1	83	13	144	5.33	2.62	7.67	8	2.3
April------	72.1	49.3	60.7	88	28	321	4.58	2.44	6.45	8	.0
May--------	81.0	57.5	69.3	94	37	598	5.26	2.76	7.43	8	.0
June-------	88.5	65.2	76.9	99	49	807	3.77	1.99	5.33	6	.0
July-------	91.5	68.9	80.2	101	54	936	3.82	2.04	5.38	6	.0
August-----	89.1	66.7	77.9	100	53	865	3.58	1.82	5.10	5	.0
September--	82.3	60.8	71.6	95	40	648	3.73	1.73	5.45	6	.0
October----	73.4	48.7	61.1	90	29	355	2.50	.80	3.88	5	.0
November---	58.6	39.1	48.9	79	16	83	4.37	1.75	6.58	6	.6
December---	47.2	30.1	38.7	70	4	13	4.12	1.81	6.09	7	1.4
Yearly-----	69.5	48.2	58.9	102	-4	4,809	48.24	39.04	56.98	77	10.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Based on data recorded in the period 1961-79 at Dexter, Mo.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 27	April 11	April 14
2 years in 10 later than--	March 21	April 6	April 10
5 years in 10 later than--	March 9	March 27	April 1
First freezing temperature in fall:			
1 year in 10 earlier than--	November 7	October 29	October 16
2 years in 10 earlier than--	November 12	November 3	October 21
5 years in 10 earlier than--	November 21	November 11	October 29

TABLE 3.--GROWING SEASON

[Based on data recorded in the period 1961-79 at Dexter, Mo.]

Probability	Length of growing season if daily minimum temperature is higher than--		
	24° F	28° F	32° F
	Days	Days	Days
9 years in 10	235	208	194
8 years in 10	242	215	200
5 years in 10	256	229	210
2 years in 10	270	243	220
1 year in 10	277	250	225

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1C	Brandon silt loam, 5 to 9 percent slopes	1,015	0.2
1D	Brandon silt loam, 9 to 14 percent slopes	1,335	0.3
3B	Loring silt loam, 2 to 5 percent slopes	22,365	4.2
3C2	Loring silt loam, 5 to 9 percent slopes, eroded	23,375	4.4
3C3	Loring silt loam, 5 to 9 percent slopes, severely eroded	17,375	3.3
3D2	Loring silt loam, 9 to 14 percent slopes, eroded	1,025	0.2
3D3	Loring silt loam, 9 to 14 percent slopes, severely eroded	8,240	1.6
5C2	Memphis silt loam, 5 to 9 percent slopes, eroded	7,445	1.4
5C3	Memphis silt loam, 5 to 9 percent slopes, severely eroded	1,990	0.4
5D3	Memphis silt loam, 9 to 14 percent slopes, severely eroded	21,850	4.1
5F	Memphis silt loam, 14 to 40 percent slopes	2,835	0.5
6F	Eustis-Memphis complex, 14 to 40 percent slopes	8,215	1.6
13B	Askew silt loam, 1 to 4 percent slopes	1,265	0.2
15D	Goss cherty silt loam, 9 to 14 percent slopes	315	*
15F	Goss cherty silt loam, 14 to 40 percent slopes	330	*
16C2	Shadygrove loam, 5 to 9 percent slopes, eroded	320	*
39	Pits, gravel	880	0.2
45	Canalou loamy sand	9,240	1.8
51	Allemands muck	420	0.1
52	Kobel silty clay loam	4,530	0.9
55	Amagon silt loam	25,620	4.9
57B2	Bosket fine sandy loam, 1 to 5 percent slopes, eroded	4,860	0.9
57C3	Bosket fine sandy loam, 5 to 9 percent slopes, severely eroded	455	0.1
57D3	Bosket fine sandy loam, 9 to 14 percent slopes, severely eroded	515	0.1
59B	Broseley loamy fine sand, 1 to 5 percent slopes	3,270	0.6
61	Calhoun silt loam	43,100	8.2
63	Commerce silt loam	13,760	2.6
64	Convent silt loam	2,285	0.4
65	Crowley silt loam	41,115	7.8
67	Dundee loam	13,995	2.7
68	Waverly silt loam	4,735	0.9
69	Falaya silt loam	53,685	10.2
71	Gideon loam	28,675	5.4
73	Lilbourn fine sandy loam	31,635	6.0
74B	Malden sand, 0 to 4 percent slopes	645	0.1
75B	Malden loamy sand, 0 to 4 percent slopes	2,630	0.5
76	Mhoon silt loam	10,270	1.9
77	Roellen silty clay loam	11,400	2.2
80	Sharkey silty clay loam	48,120	9.1
81	Sharkey silty clay	4,140	0.8
83	Sikeston loam	1,865	0.4
85	Wardell loam	3,585	0.7
87B	Dubbs silt loam, 1 to 5 percent slopes	7,730	1.5
89	Foley silt loam	770	0.1
91	Forestdale silty clay loam	3,500	0.7
93	Collins silt loam	2,735	0.5
95	Farrenburg fine sandy loam	11,630	2.2
97	Zachary silt loam	10,514	2.0
99	Tuckerman fine sandy loam	5,970	1.1
	Total land area	527,574	100.0
	Water, greater than 40 acres	2,922	
	Total area	530,496	

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses]

Map symbol	Soil name
3B	Loring silt loam, 2 to 5 percent slopes
13B	Askew silt loam, 1 to 4 percent slopes
45	Canalou loamy sand
52	Kobel silty clay loam (where drained)
55	Amagon silt loam (where drained)
57B2	Bosket fine sandy loam, 1 to 5 percent slopes, eroded
59B	Broseley loamy fine sand, 1 to 5 percent slopes
61	Calhoun silt loam (where drained)
63	Commerce silt loam (where drained)
64	Convent silt loam (where drained)
65	Crowley silt loam (where drained)
67	Dundee loam (where drained)
68	Waverly silt loam (where drained)
69	Falaya silt loam (where drained)
71	Gideon loam (where drained)
73	Lilbourn fine sandy loam (where drained)
76	Mhoon silt loam (where drained)
77	Roellen silty clay loam (where drained)
80	Sharkey silty clay loam (where drained)
81	Sharkey silty clay (where drained)
83	Sikeston loam (where drained)
85	Wardell loam (where drained)
87B	Dubbs silt loam, 1 to 5 percent slopes
91	Forestdale silty clay loam (where drained)
93	Collins silt loam
95	Farrenburg fine sandy loam
97	Zachary silt loam (where drained)
99	Tuckerman fine sandy loam (where drained)

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of an entry indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Capability subclass		Corn		Soybeans	Winter wheat	Grain sorghum	Rice	Tall fescue
	N	I	N	I	N	N	N	I	N
			Bu	Bu	Bu	Bu	Bu	Bu	AUM*
1C--------------- Brandon	IIIe	---	---	---	30	30	50	---	6.0
1D--------------- Brandon	IVe	---	---	---	---	---	45	---	5.5
3B--------------- Loring	IIe	---	90	---	30	40	90	---	7.0
3C2-------------- Loring	IIIe	---	70	---	25	35	85	---	6.5
3C3-------------- Loring	IVe	---	55	---	20	30	60	---	6.0
3D2-------------- Loring	IVe	---	55	---	20	30	60	---	6.5
3D3-------------- Loring	VIe	---	---	---	---	---	---	---	5.0
5C2-------------- Memphis	IIIe	---	80	---	30	30	90	---	7.5
5C3-------------- Memphis	IIIe	---	60	---	25	25	50	---	5.5
5D3-------------- Memphis	VIe	---	---	---	---	---	---	---	5.0
5F--------------- Memphis	VIe	---	---	---	---	---	---	---	6.0
6F--------------- Eustis-Memphis	VIe	---	---	---	---	---	---	---	3.0
13B-------------- Askew	IIw	---	80	135	35	40	80	---	7.0
15D-------------- Goss	VIs	---	---	---	---	---	---	---	6.0
15F-------------- Goss	VIIs	---	---	---	---	---	---	---	5.0
16C2------------- Shadygrove	IVe	---	78	---	30	40	90	---	7.0
45--------------- Canalou	IIIs	---	60	130	26	40	90	---	---
51--------------- Allemands	IVw	---	100	---	30	---	---	---	6.0
52--------------- Kobel	IIIw	---	---	---	40	50	100	130	8.0
55--------------- Amagon	IIIw	---	---	130	35	45	120	120	9
57B2------------- Bosket	IIe	---	85	140	35	45	110	---	9

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Capability subclass		Corn		Soybeans	Winter wheat	Grain sorghum	Rice	Tall fescue
	N	I	N	I	N	N	N	I	N
			Bu	Bu	Bu	Bu	Bu	Bu	AUM*
57C3------------- Bosket	IIIe	---	---	---	20	30	55	---	7.5
57D3------------- Bosket	VIe	---	---	---	---	---	---	---	6.5
59B-------------- Broseley	IIs	---	65	120	30	40	105	---	---
61--------------- Calhoun	IIIw	---	40	130	25	35	105	120	---
63--------------- Commerce	IIw	---	95	140	35	45	100	---	---
64--------------- Convent	IIw	---	95	140	40	45	100	---	---
65--------------- Crowley	IIIw	---	60	130	30	35	105	130	---
67--------------- Dundee	IIw	---	85	140	35	50	110	---	9.0
68--------------- Waverly	IIIw	---	70	130	30	45	100	---	9.0
69--------------- Falaya	IIw	---	100	150	40	45	110	110	8.5
71--------------- Gideon	IIw	---	95	130	---	35	---	100	---
73--------------- Lilbourn	IIw	---	72	140	30	45	100	---	---
74B, 75B--------- Malden	IIIs	---	65	120	25	40	90	---	6.0
76--------------- Mhoon	IIw	---	85	140	30	40	110	130	---
77--------------- Roellen	IIIw	---	---	120	33	40	100	130	---
80--------------- Sharkey	IIIw	---	---	120	35	50	---	130	---
81--------------- Sharkey	IVw	---	---	---	30	---	---	120	---
83--------------- Sikeston	IIIw	---	96	140	36	45	110	---	---
85--------------- Wardell	IIw	---	95	130	36	40	100	120	---
87B-------------- Dubbs	IIe	---	85	145	35	45	110	---	10.0
89--------------- Foley	IIIw	---	---	135	30	35	---	130	---
91--------------- Forestdale	IIIw	---	---	110	30	35	90	125	5.0
93--------------- Collins	IIw	---	110	145	40	50	115	---	10
95--------------- Farrenburg	IIs	---	90	145	36	50	110	---	---

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Capability subclass		Corn		Soybeans	Winter wheat	Grain sorghum	Rice	Tall fescue
	N	I	N	I	N	N	N	I	N
			Bu	Bu	Bu	Bu	Bu	Bu	AUM*
97--------------- Zachary	IIIw	---	---	130	28	40	110	130	---
99--------------- Tuckerman	IIIw	---	---	120	30	40	100	100	9

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
							Ft	
1C, 1D: Brandon	3o	Slight	Slight	Slight	Slight	Northern red oak Shortleaf pine Loblolly pine	69 70 80	Shortleaf pine, loblolly pine, northern red oak.
3B, 3C2, 3C3, 3D2, 3D3: Loring	3o	Slight	Slight	Slight	Slight	White oak Black oak Shortleaf pine	62 66 62	Shortleaf pine, yellow-poplar, black oak, white oak.
5C2, 5C3, 5D3: Memphis	2o	Slight	Slight	Slight	Slight	Cherrybark oak Yellow-poplar Sweetgum	90 90 90	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
5F: Memphis	2r	Moderate	Moderate	Moderate	Slight	Cherrybark oak Yellow-poplar Sweetgum	90 90 90	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
6F:								
Eustis	3r	Moderate	Moderate	Moderate	Slight	Yellow-poplar Sweetgum	85 80	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
Memphis	2r	Moderate	Moderate	Moderate	Slight	Cherrybark oak Yellow-poplar Sweetgum	90 90 90	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
13B: Askew	2o	Slight	Slight	Slight	Slight	Eastern cottonwood Cherrybark oak Willow oak Sweetgum	100 90 90 90	Eastern cottonwood, cherrybark oak, American sycamore.
15D: Goss	4f	Slight	Moderate	Slight	Slight	White oak Shortleaf pine Northern red oak Black oak	60 --- --- ---	Sweetgum, yellow-poplar, northern red oak, white oak.
15F: Goss	4f	Slight	Severe	Moderate	Slight	White oak Shortleaf pine Black oak	60 --- ---	Sweetgum, yellow-poplar, northern red oak, white oak.
16C2: Shadygrove	3o	Slight	Slight	Slight	Slight	Sweetgum Yellow-poplar	80 ---	Northern red oak, white oak, yellow-poplar.
45: Canalou	3s	Slight	Slight	Moderate	Slight	Eastern cottonwood Pin oak Black oak Sweetgum Shortleaf pine	86 80 --- --- ---	Eastern cottonwood, pin oak, American sycamore, shortleaf pine, sweetgum, loblolly pine.
52: Kobel	3w	Slight	Severe	Severe	Slight	Green ash Eastern cottonwood Pin oak	75 90 ---	Eastern cottonwood, cherrybark oak, green ash, pecan.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
							Ft	
55 Amagon	1w	Slight	Severe	Moderate	---------	Sweetgum Eastern cottonwood Pin oak Willow oak Cherrybark oak Green ash	100 100 100 100 90 80	Eastern cottonwood, cherrybark oak, water oak, pin oak, willow oak, sweetgum, American sycamore.
57B2, 57C3, 57D3 Bosket	2o	Slight	Slight	Slight	--------	Eastern cottonwood Green ash Sweetgum Cherrybark oak Willow oak	100 80 90 90 90	Eastern cottonwood, green ash, sweetgum, cherrybark oak, willow oak, Shumard oak, American sycamore.
59B Broseley	4s	Slight	Slight	Moderate	Slight	Eastern cottonwood Pin oak	80 70	Eastern cottonwood, pin oak.
61 Calhoun	3w	Slight	Severe	Moderate	Moderate	Sweetgum Pin oak American sycamore Cherrybark oak	80 80 --- ---	Sweetgum, loblolly pine.
63 Commerce	1o	Slight	Slight	Slight	Slight	Eastern cottonwood Green ash Pecan American sycamore	120 80 --- ---	Eastern cottonwood, American sycamore, pecan, sweetgum.
64 Convent	1o	Slight	Slight	Slight	Slight	Green ash Eastern cottonwood Sweetgum American sycamore Pecan	80 120 110 --- ---	Eastern cottonwood, American sycamore, pecan, green ash, sweetgum.
65 Crowley	3c	Slight	Slight	Severe	Severe	Loblolly pine	83	Loblolly pine, eastern white pine, white oak, sweetgum.
67 Dundee	2o	Slight	Slight	Slight	Slight	Cherrybark oak Eastern cottonwood Sweetgum	105 100 100	Cherrybark oak, eastern cottonwood, sweetgum.
68 Waverly	2w	Slight	Severe	Severe	Moderate	Eastern cottonwood Cherrybark oak Pin oak Willow oak Loblolly pine Sweetgum	105 100 95 95 95 100	Eastern cottonwood, cherrybark oak, willow oak, sweetgum, American sycamore, water tupelo, baldcypress.
69 Falaya	1o	Slight	Slight	Slight	Slight	Cherrybark oak Green ash Eastern cottonwood	102 92 100	Green ash, eastern cottonwood, cherrybark oak, sweetgum.
71 Gideon	2w	Slight	Severe	Moderate	Moderate	Eastern cottonwood Baldcypress	96 ---	Eastern cottonwood, American sycamore, sweetgum, baldcypress.
73 Lilbourn	3o	Slight	Slight	Slight	Slight	Eastern cottonwood Pin oak Baldcypress	90 80 ---	Eastern cottonwood, pin oak, baldcypress, green ash.
74B, 75B Malden	3s	Slight	Slight	Moderate	Slight	Sweetgum American sycamore	80 ---	Shortleaf pine, eastern white pine, black oak, American sycamore, sweetgum.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
							Ft	
76----------------- Mhoon	1w	Slight	Severe	Moderate	Moderate	Green ash----------- Eastern cottonwood-- Pin oak------------- Cherrybark oak------ Sweetgum------------ American sycamore---	90 110 --- --- 100 ---	Eastern cottonwood, American sycamore, cherrybark oak, sweetgum.
77----------------- Roellen	2w	Slight	Severe	Severe	Moderate	Eastern cottonwood-- Sweetgum------------ Pin oak------------- Cherrybark oak------	100 90 --- 90	Eastern cottonwood, sweetgum, cherrybark oak.
80, 81------------- Sharkey	3w	Slight	Severe	Severe	Moderate	Green ash----------- Eastern cottonwood-- Pecan--------------- Sweetgum------------ Cherrybark oak------	65 86 --- --- ---	Eastern cottonwood, sweetgum, cherrybark oak.
83----------------- Sikeston	2w	Slight	Severe	Moderate	Moderate	Eastern cottonwood-- Pin oak------------- Sweetgum------------ Baldcypress---------	100 95 95 ---	Eastern cottonwood, pin oak, American sycamore, sweetgum, baldcypress.
85----------------- Wardell	3w	Slight	Severe	Moderate	Moderate	Eastern cottonwood-- Pin oak-------------	90 80	Eastern cottonwood, pin oak, sweetgum, pecan.
87B---------------- Dubbs	2o	Slight	Slight	Slight	Slight	Cherrybark oak------ Eastern cottonwood-- Green ash----------- Shumard oak--------- Sweetgum------------ Pin oak------------- Willow oak----------	100 100 80 100 95 90 95	Eastern cottonwood, green ash, pin oak, sweetgum, American sycamore, yellow-poplar.
89----------------- Foley	3w	Slight	Severe	Moderate	Moderate	Sweetgum------------ Cherrybark oak------ Pin oak------------- White oak-----------	80 80 --- ---	Sweetgum, American sycamore, cherrybark oak.
91----------------- Forestdale	2w	Slight	Severe	Moderate	Moderate	Green ash----------- Eastern cottonwood-- Cherrybark oak------ Pin oak------------- Willow oak---------- Sweetgum------------	78 100 94 --- 94 100	Green ash, eastern cottonwood, sweetgum, American sycamore, cherrybark oak.
93----------------- Collins	1o	Slight	Slight	Slight	Slight	Green ash----------- Eastern cottonwood-- Cherrybark oak------	95 115 110	Green ash, eastern cottonwood, cherrybark oak, yellow-poplar.
95----------------- Farrenburg	2o	Slight	Slight	Slight	Slight	Eastern cottonwood-- Pin oak------------- Sweetgum------------ Baldcypress---------	96 86 --- ---	Eastern cottonwood, pin oak, American sycamore, baldcypress, sweetgum.
97----------------- Zachary	2w	Slight	Severe	Moderate	Moderate	Eastern cottonwood--	100	Eastern cottonwood, green ash, sweetgum, baldcypress.
99----------------- Tuckerman	2w	Slight	Severe	Moderate	Moderate	Cherrybark oak------ Green ash----------- Eastern cottonwood-- Pin oak------------- Willow oak---------- Sweetgum------------	80 100 95 --- 95 ---	Green ash, eastern cottonwood, sweetgum, American sycamore, cherrybark oak, pin oak, willow oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1C, 1D------------ Brandon	---	Amur honeysuckle, fragrant sumac, Amur maple, autumn-olive.	Eastern redcedar, Virginia pine, shortleaf pine, black locust, hackberry, green ash, bur oak.	American sycamore	---
3B, 3C2, 3C3, 3D2, 3D3--------------- Loring	---	Amur honeysuckle, possumhaw, Amur maple, autumn-olive.	Eastern redcedar, Virginia pine, shortleaf pine, hackberry, green ash, osageorange, black locust, jack pine.	---	---
5C2, 5C3, 5D3, 5F- Memphis	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Eastern redcedar, black walnut, Virginia pine.	Green ash, shortleaf pine, cherrybark oak, loblolly pine.	Yellow-poplar.
6F*:					
Eustis-----------	---	Amur honeysuckle, Tatarian honeysuckle, autumn-olive, bur oak, osageorange.	Eastern redcedar, shortleaf pine, Virginia pine, loblolly pine, American sycamore.	Eastern cottonwood	---
Memphis----------	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Eastern redcedar, black walnut, Virginia pine.	Green ash, shortleaf pine, cherrybark oak, loblolly pine.	Yellow-poplar.
13B--------------- Askew	---	Amur honeysuckle, Amur maple, autumn-olive, deciduous holly.	Eastern redcedar, pecan, Virginia pine.	Baldcypress, loblolly pine, cherrybark oak, green ash, sweetgum.	---
15D, 15F---------- Goss	Siberian peashrub	Lilac, Amur honeysuckle, autumn-olive, Tatarian honeysuckle, eastern redcedar, Washington hawthorn, radiant crabapple.	Eastern white pine, jack pine, red pine, Austrian pine.	---	---
16C2-------------- Shadygrove	---	Amur honeysuckle, possumhaw, Amur maple, autumn-olive.	Eastern redcedar, Virginia pine, shortleaf pine, hackberry, green ash, osageorange, black locust, jack pine.	---	---
39*. Pits					

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
45 Canalou	---	Amur honeysuckle, Amur maple, possumhaw, autumn-olive.	Eastern redcedar, Virginia pine.	Sweetgum, green ash, pecan, cherrybark oak, loblolly pine, baldcypress.	---
51 Allemands	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
52 Kobel	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar, bur oak, hackberry.	Green ash, loblolly pine, silver maple, American sycamore.	Sweetgum, eastern cottonwood.
55 Amagon	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
57B2, 57C3, 57D3 Bosket	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Eastern redcedar, black walnut, Virginia pine.	Green ash, shortleaf pine, cherrybark oak, loblolly pine.	Yellow-poplar.
59B Broseley	Blackhaw	Amur maple	Autumn-olive, possumhaw, eastern redcedar.	Shortleaf pine, green ash, hackberry, sweetgum, loblolly pine, yellow-poplar, American sycamore.	---
61 Calhoun	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
63 Commerce	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Virginia pine, eastern redcedar.	Pecan, green ash, cherrybark oak, sweetgum, loblolly pine, baldcypress.	---
64 Convent	---	American plum, possumhaw, Manchurian crabapple, autumn-olive.	Virginia pine, eastern redcedar, northern white-cedar.	Green ash, loblolly pine, baldcypress, water oak.	Sweetgum.
65 Crowley	---	Amur honeysuckle, possumhaw, Amur maple, autumn-olive.	Eastern redcedar, Virginia pine, shortleaf pine, hackberry, green ash, osageorange, black locust, jack pine.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
67. Dundee	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Virginia pine, eastern redcedar.	Pecan, green ash, cherrybark oak, sweetgum, loblolly pine, baldcypress.	---
68. Waverly	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
69. Falaya	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Virginia pine, eastern redcedar.	Pecan, green ash, cherrybark oak, sweetgum, loblolly pine, baldcypress.	---
71. Gideon	Buttonbush	Amur honeysuckle, silky dogwood.	Eastern redcedar, bur oak, hackberry.	Loblolly pine, American sycamore green ash, silver maple.	Eastern cottonwood sweetgum.
73. Lilbourn	---	Amur honeysuckle, possumhaw, Amur maple, autumn-olive.	Virginia pine, eastern redcedar.	Pecan, cherrybark oak, green ash, loblolly pine, baldcypress.	Eastern cottonwood.
74B, 75B. Malden	---	Amur honeysuckle, Tatarian honeysuckle, Amur maple, bur oak, osageorange.	Eastern redcedar, shortleaf pine, Virginia pine, loblolly pine, American sycamore.	Eastern cottonwood	---
76. Mhoon	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
77. Roellen	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
80, 81. Sharkey	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
83. Sikeston	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Sweetgum, pin oak, eastern cottonwood.
85. Wardell	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Sweetgum, pin oak, eastern cottonwood.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
87B: Dubbs	---	Amur honeysuckle, Amur maple, autumn-olive, deciduous holly.	Eastern redcedar, Virginia pine, black walnut.	Loblolly pine, shortleaf pine, cherrybark oak, green ash.	---
89: Foley	Tatarian honeysuckle.	Eastern redcedar, green ash.	---	---	Eastern cottonwood.
91: Forestdale	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
93: Collins	---	Amur honeysuckle, Amur maple, autumn-olive, possumhaw.	Virginia pine, eastern redcedar.	Pecan, green ash, cherrybark oak, sweetgum, loblolly pine, baldcypress.	---
95: Farrenburg	---	Amur honeysuckle, possumhaw, Amur maple, autumn-olive.	Virginia pine, eastern redcedar.	Pecan, cherrybark oak, green ash, loblolly pine, baldcypress.	Eastern cottonwood.
97: Zachary	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.
99: Tuckerman	Buttonbush	Silky dogwood, Amur honeysuckle.	Eastern redcedar	Green ash, loblolly pine, water oak, baldcypress, American sycamore.	Pin oak, sweetgum, eastern cottonwood.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1C Brandon	Slight	Slight	Severe: slope.	Slight	Slight.
1D Brandon	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
3B Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
3C2, 3C3 Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
3D2, 3D3 Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
5C2, 5C3 Memphis	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
5D3, 5F Memphis	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
6F*:					
Eustis	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: slope.
Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
13B Askew	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
15D Goss	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
15F Goss	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
16C2 Shadygrove	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: large stones, droughty.
45 Canalou	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
51 Allemands	Severe: flooding, ponding, percs slowly.	Severe: ponding, excess humus, percs slowly.	Severe: excess humus, ponding, percs slowly.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
52 Kobel	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
55 Amagon	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
57B2, 57C3 Bosket	Slight	Slight	Moderate: slope.	Slight	Slight.
57D3 Bosket	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
59B Broseley	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
61 Calhoun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
63 Commerce	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.
64 Convent	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.
65 Crowley	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
67 Dundee	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
68 Waverly	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
69 Falaya	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
71 Gideon	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
73 Lilbourn	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
74B Malden	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
75B Malden	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
76 Mhoon	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
77 Roellen	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
80 Sharkey	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
81 Sharkey	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
83 Sikeston	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
85 Wardell	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
87B Dubbs	Slight	Slight	Moderate: slope.	Slight	Slight.
89 Foley	Severe: wetness, percs slowly.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
91 Forestdale	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
93 Collins	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight	Moderate: flooding.
95 Farrenburg	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
97 Zachary	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
99 Tuckerman	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1C------------------ Brandon	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
1D------------------ Brandon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
3B------------------ Loring	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
3C2, 3C3, 3D2, 3D3- Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
5C2, 5C3, 5D3------ Memphis	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
5F------------------ Memphis	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
6F*:										
Eustis------------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Memphis-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
13B----------------- Askew	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
15D----------------- Goss	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
15F----------------- Goss	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
16C2---------------- Shadygrove	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45------------------ Canalou	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
51------------------ Allemands	Poor	Fair	Fair	Fair	---	Good	Very poor.	Fair	Fair	Good.
52------------------ Kobel	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
55------------------ Amagon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
57B2---------------- Bosket	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
57C3---------------- Bosket	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
57D3---------------- Bosket	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
59B----------------- Broseley	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
61----------------- Calhoun	Poor	Fair	Fair	Good	---	Good	Good	Fair	Fair	Good.
63----------------- Commerce	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
64----------------- Convent	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
65----------------- Crowley	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
67----------------- Dundee	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
68----------------- Waverly	Poor	Fair	Good	Fair	---	Good	Fair	Fair	Fair	Fair.
69----------------- Falaya	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
71----------------- Gideon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
73----------------- Lilbourn	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
74B, 75B----------- Malden	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
76----------------- Mhoon	Fair	Fair	Fair	Good	---	Good	Good	Fair	Good	Good.
77----------------- Roellen	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
80, 81------------- Sharkey	Fair	Fair	Fair	Good	---	Good	Good	Fair	Good	Good.
83----------------- Sikeston	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
85----------------- Wardell	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
87B---------------- Dubbs	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
89----------------- Foley	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
91----------------- Forestdale	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
93----------------- Collins	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
95----------------- Farrenburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
97----------------- Zachary	Fair	Fair	Fair	Good	Fair	Good	Good	Poor	Good	Good.
99----------------- Tuckerman	Fair	Fair	Fair	Fair	---	Good	Fair	Fair	Fair	Fair.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1C----------------- Brandon	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.	Slight.
1D----------------- Brandon	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
3B----------------- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
3C2, 3C3----------- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
3D2, 3D3----------- Loring	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
5C2, 5C3----------- Memphis	Slight----------	Slight----------	Slight----------	Moderate: slope.	Severe: low strength.	Slight.
5D3, 5F------------ Memphis	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
6F*:						
Eustis------------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Memphis-----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
13B---------------- Askew	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
15D---------------- Goss	Moderate: too clayey, large stones, slope.	Moderate: shrink-swell, slope, large stones.	Moderate: slope, shrink-swell, large stones.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: droughty.
15F---------------- Goss	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
16C2--------------- Shadygrove	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Moderate: large stones, droughty.
45----------------- Canalou	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Slight.
51----------------- Allemands	Severe: excess humus, ponding.	Severe: flooding, shrink-swell, low strength.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, low strength.	Severe: low strength, ponding.	Severe: ponding, excess humus.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
52---------------- Kobel	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness.
55---------------- Amagon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength.	Moderate: wetness.
57B2-------------- Bosket	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
57C3-------------- Bosket	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
57D3-------------- Bosket	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
59B--------------- Broseley	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
61---------------- Calhoun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
63---------------- Commerce	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength.	Moderate: wetness.
64---------------- Convent	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
65---------------- Crowley	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
67---------------- Dundee	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
68---------------- Waverly	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
69---------------- Falaya	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.
71---------------- Gideon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness.
73---------------- Lilbourn	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
74B, 75B---------- Malden	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
76---------------- Mhoon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
77 Roellen	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness.
80 Sharkey	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness.
81 Sharkey	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, too clayey.
83 Sikeston	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
85 Wardell	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
87B Dubbs	Slight	Slight	Slight	Slight	Slight	Slight.
89 Foley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: excess sodium, wetness.
91 Forestdale	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell, low strength.	Severe: wetness.
93 Collins	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
95 Farrenburg	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Slight.
97 Zachary	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
99 Tuckerman	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1C, 1D Brandon	Slight	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
3B Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
3C2, 3C3 Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
3D2, 3D3 Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
5C2, 5C3 Memphis	Moderate: percs slowly.	Severe: slope.	Slight	Slight	Good.
5D3, 5F Memphis	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
6F*:					
Eustis	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
13B Askew	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
15D Goss	Moderate: percs slowly, slope, large stones.	Severe: seepage, slope.	Severe: too clayey, large stones.	Severe: seepage.	Poor: too clayey, small stones.
15F Goss	Severe: slope.	Severe: seepage, slope.	Severe: slope, too clayey, large stones.	Severe: seepage, slope.	Poor: too clayey, small stones, slope.
16C2 Shadygrove	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey, large stones.	Moderate: wetness.	Poor: too clayey, hard to pack, large stones.
45 Canalou	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness, thin layer.
51 Allemands	Severe: ponding, percs slowly.	Severe: ponding, seepage, excess humus.	Severe: ponding, too clayey, excess humus.	Severe: seepage, ponding.	Poor: too clayey, ponding, excess humus.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
52----------------- Kobel	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
55----------------- Amagon	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
57B2, 57C3---------- Bosket	Slight-----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
57D3---------------- Bosket	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
59B----------------- Broseley	Slight-----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
61------------------ Calhoun	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
63------------------ Commerce	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: thin layer.
64------------------ Convent	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
65------------------ Crowley	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
67------------------ Dundee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
68------------------ Waverly	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
69------------------ Falaya	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
71------------------ Gideon	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
73------------------ Lilbourn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
74B, 75B------------ Malden	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
76------------------ Mhoon	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
77 Roellen	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
80, 81 Sharkey	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
83 Sikeston	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
85 Wardell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
87B Dubbs	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
89 Foley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: hard to pack, wetness, excess sodium.
91 Forestdale	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
93 Collins	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
95 Farrenburg	Severe: wetness.	Severe: wetness.	Moderate: flooding, wetness.	Moderate: flooding, wetness.	Fair: wetness.
97 Zachary	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
99 Tuckerman	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1C, 1D Brandon	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
3B, 3C2, 3C3 Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3D2, 3D3 Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
5C2, 5C3 Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
5D3, 5F Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
6F*:				
Eustis	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
13B Askew	Poor: low strength.	Probable	Improbable: too sandy.	Good.
15D Goss	Fair: low strength, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
15F Goss	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
16C2 Shadygrove	Poor: shrink-swell.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim.
45 Canalou	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
51 Allemands	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
52 Kobel	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
55 Amagon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
57B2, 57C3 Bosket	Good	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
57D3----- Bosket	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
59B----- Broseley	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
61----- Calhoun	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
63----- Commerce	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
64----- Convent	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
65----- Crowley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
67----- Dundee	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
68----- Waverly	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
69----- Falaya	Fair: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
71----- Gideon	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
73----- Lilbourn	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
74B----- Malden	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
75B----- Malden	Good-----	Probable-----	Improbable: too sandy.	Fair: too sandy.
76----- Mhoon	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
77----- Roellen	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
80----- Sharkey	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
81----- Sharkey	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
83----- Sikeston	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
85----- Wardell	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of tale.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
87B-------------------- Dubbs	Good------------------	Improbable: excess fines.	Improbable: excess fines.	Good.
89--------------------- Foley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
91--------------------- Forestdale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
93--------------------- Collins	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
95--------------------- Farrenburg	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
97--------------------- Zachary	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
99--------------------- Tuckerman	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1C: Brandon	Severe: seepage.	Severe: seepage.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
1D: Brandon	Severe: seepage.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
3B, 3C2, 3C3: Loring	Moderate: seepage.	Moderate: piping.	Slope	Wetness, rooting depth, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
3D2, 3D3: Loring	Moderate: seepage.	Moderate: piping.	Slope	Wetness, rooting depth, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
5C2, 5C3: Memphis	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
5D3, 5F: Memphis	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
6F*:						
Eustis	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
Memphis	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
13B: Askew	Severe: seepage.	Severe: piping.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
15D, 15F: Goss	Severe: slope.	Severe: large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
16C2: Shadygrove	Slight	Severe: large stones.	Percs slowly, large stones, slope.	Large stones, percs slowly, slope.	Large stones, erodes easily.	Large stones, erodes easily.
45: Canalou	Severe: seepage.	Severe: piping.	Favorable	Wetness, fast intake, soil blowing.	Wetness, soil blowing.	Favorable.
51: Allemands	Slight	Severe: piping, ponding, excess humus.	Percs slowly, ponding, subsides.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
52: Kobel	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
55: Amagon	Slight	Moderate: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily	Wetness, percs slowly.
57B2: Bosket	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
57C3: Bosket	Severe: seepage.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
57D3: Bosket	Severe: seepage.	Severe: piping.	Deep to water	Slope	Slope	Slope.
59B: Broseley	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing	Droughty.
61: Calhoun	Slight	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
63: Commerce	Moderate: seepage.	Severe: thin layer, wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
64: Convent	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Erodes easily.
65: Crowley	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
67: Dundee	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
68: Waverly	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
69: Falaya	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
71: Gideon	Slight	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
73: Lilbourn	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
74B, 75B: Malden	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
76: Mhoon	Slight	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
77: Roellen	Moderate: seepage.	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
80: Sharkey	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
81: Sharkey	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
83: Sikeston	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
85----------------- Wardell	Slight----------	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
87B---------------- Dubbs	Severe: seepage.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
89----------------- Foley	Slight----------	Severe: wetness, excess sodium.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
91----------------- Forestdale	Slight----------	Severe: piping, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
93----------------- Collins	Moderate: seepage.	Severe: piping.	Flooding--------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
95----------------- Farrenburg	Moderate: seepage.	Severe: piping.	Favorable-------	Wetness, soil blowing.	Wetness, soil blowing.	Favorable.
97----------------- Zachary	Moderate: seepage.	Severe: thin layer, wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
99----------------- Tuckerman	Moderate: seepage.	Severe: piping, wetness.	Flooding--------	Wetness, flooding.	Wetness---------	Wetness.

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1C, 1D----------- Brandon	0-5	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	5-32	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	3-15
	32-60	Extremely gravelly sandy loam, gravelly loam, extremely gravelly loam.	GM, GC, GM-GC, SM-SC	A-2, A-4, A-1	0-5	30-70	20-60	15-55	10-50	<30	NP-10
3B, 3C2, 3C3, 3D2, 3D3-------- Loring	0-8	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	8-28	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	28-52	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
	52-72	Silt loam--------	CL, ML	A-4, A-6, A-7	0	100	100	95-100	70-100	28-45	7-20
5C2, 5C3, 5D3, 5F-------------- Memphis	0-12	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	12-58	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	58-72	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
6F*: Eustis----------	0-2	Sand-------------	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-16	---	NP
	2-33	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-16	---	NP
	33-72	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
Memphis---------	0-12	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	12-58	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	58-72	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
13B------------- Askew	0-6	Silt loam--------	ML	A-4, A-6	0	100	100	80-100	60-100	25-32	7-12
	6-46	Silty clay loam, silt loam, loam.	CL, ML	A-6, A-4	0	100	100	90-100	70-90	25-40	6-20
	46-60	Sandy loam, fine sandy loam, silt loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	65-100	25-90	20-40	1-20
15D, 15F--------- Goss	0-6	Cherty silt loam	ML, CL, CL-ML	A-4	0-10	65-90	65-90	65-90	65-85	20-30	2-8
	6-12	Very cherty silty clay loam, very cherty silt loam.	GM, GC, GM-GC	A-2	10-40	40-60	35-55	30-50	25-35	20-30	2-8
	12-60	Cherty silty clay loam, very cherty silty clay, very cherty clay.	GC	A-7	10-45	45-70	40-65	40-50	35-45	50-70	30-40
16C2------------- Shadygrove	0-5	Loam-------------	CL-ML, CL	A-4, A-6	1-15	85-100	85-100	80-95	55-80	20-38	5-16
	5-60	Clay, clay loam, sandy clay.	CL, CH	A-7	1-15	95-100	95-100	90-100	85-95	44-65	22-40

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
45----------------- Canalou	0-20	Loamy sand--------	SM	A-2-4	0	100	100	50-75	15-30	---	NP
	20-39	Sandy loam--------	SM	A-4	0	100	100	65-90	35-50	---	NP
	39-60	Sand, loamy sand	SM, SP-SM	A-3, A-2-4	0	100	100	50-75	5-30	---	NP
51----------------- Allemands	0-25	Muck--------------	PT	A-8	0	---	---	---	---	---	---
	25-64	Clay, mucky clay	MH, OH	A-7-5	0	100	100	95-100	80-100	65-90	30-50
	50-60	Clay, very fine sandy loam, silty clay loam.	CH, CL, ML, MH	A-7-6, A-6, A-4	0	100	100	85-95	75-95	30-75	6-45
52----------------- Kobel	0-6	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	45-55	25-35
	6-66	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-95	45-75	25-50
	55-72	Sandy clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	85-95	60-75	45-70	25-45
55----------------- Amagon	0-7	Silt loam---------	ML, CL, CL-ML	A-4	0	100	100	85-100	85-100	<30	NP-10
	7-59	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	85-100	85-100	30-45	11-22
	59-69	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	80-100	60-100	20-45	1-22
57B2--------------- Bosket	0-15	Fine sandy loam	SM	A-2, A-4	0	100	100	75-100	25-45	<20	NP-3
	15-37	Sandy clay loam, clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	100	85-100	30-70	25-40	5-17
	37-66	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	100	100	75-100	25-45	<20	NP-3
57C3, 57D3-------- Bosket	0-4	Fine sandy loam	SM	A-2, A-4	0	100	100	75-100	25-45	<20	NP-3
	4-35	Sandy clay loam, clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	100	85-100	30-70	25-40	5-17
	35-60	Fine sandy loam, sandy loam, sand.	SM	A-2, A-4	0	100	100	65-100	15-45	<20	NP-3
59B---------------- Broseley	0-27	Loamy fine sand	SM	A-2, A-4	0	100	100	60-95	20-50	<20	NP-3
	27-50	Fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-4, A-6	0	100	100	65-95	36-50	20-35	2-15
	50-63	Stratified loamy sand to sandy loam.	SM, SM-SC	A-4, A-2	0	100	100	60-80	20-50	<25	NP-7
61----------------- Calhoun	0-18	Silt loam---------	CL-ML, ML, CL	A-4	0	100	100	100	95-100	<31	NP-10
	18-65	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	100	100	95-100	95-100	30-45	11-24
63----------------- Commerce	0-11	Silt loam---------	CL-ML, CL, ML	A-4	0	100	100	100	75-100	<30	NP-10
	11-28	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	0	100	100	100	85-100	32-45	11-23
	28-68	Stratified very fine sandy loam to silty clay.	CL-ML, CL, ML	A-4, A-6, A-7-6	0	100	100	100	75-100	23-45	3-23
64----------------- Convent	0-8	Silt loam---------	ML, CL-ML	A-4	0	100	100	95-100	85-100	<27	NP-7
	8-66	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	100	95-100	75-100	<27	NP-7
65----------------- Crowley	0-9	Silt loam---------	ML, CL-ML, CL	A-4	0	100	100	95-100	80-100	<30	NP-10
	9-72	Silty clay, silty clay loam.	CH, CL	A-7-6	0	100	100	95-100	85-100	41-60	20-35

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
67 Dundee	0-10	Loam	ML, CL-ML	A-4	0	100	100	75-95	51-75	<30	NP-7
	10-60	Silty clay loam, clay loam, sandy clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	28-44	12-22
68 Waverly	0-8	Silt loam	ML, CL, CL-ML	A-4	0	100	100	90-100	65-95	<25	NP-9
	8-63	Silt, silt loam	ML, CL, CL-ML	A-4	0	100	100	95-100	85-100	20-30	3-10
69 Falaya	0-36	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	95-100	<30	NP-10
	36-75	Silt loam, silty clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	100	95-100	25-43	7-16
71 Gideon	0-7	Loam	SC, CL-ML, CL, SM-SC	A-4, A-6	0	100	100	75-95	45-80	20-35	5-20
	7-63	Clay loam, sandy clay loam.	SC, CL	A-6	0	100	100	80-100	40-70	25-35	11-20
73 Lilbourn	0-13	Fine sandy loam	ML, SM	A-4	0	100	100	85-100	40-65	<20	NP-4
	13-55	Fine sandy loam, sandy loam, loam.	ML, SM	A-4	0	100	100	75-100	40-65	<20	NP-4
	55-61	Stratified very fine sandy loam to sand.	SM, SM-SC	A-4, A-2	0	100	100	85-100	15-50	<25	NP-7
74B Malden	0-14	Sand	SM, SP-SM	A-2-4	0	100	100	50-70	5-15	---	NP
	14-28	Fine sand, loamy fine sand.	SM, SP-SM	A-2-4	0	100	100	55-90	10-30	---	NP
	28-64	Fine sand, gravelly sand, very gravelly sand.	SM, SP-SM, GM, GP-GM	A-2-4	0	45-90	40-85	30-75	5-15	---	NP
75B Malden	0-14	Loamy sand	SM	A-2-4	0	100	100	50-75	15-30	---	NP
	14-52	Loamy sand, loamy fine sand.	SM, SP-SM	A-2-4	0	100	100	55-90	10-30	---	NP
	52-70	Fine sand, sand	SM, SP-SM	A-2-4	0	100	100	55-90	10-25	---	NP
76 Mhoon	0-11	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	95-100	22-30	3-10
	11-72	Silty clay loam, silt loam, clay loam.	CL, CH	A-6, A-7-6	0	100	100	100	95-100	30-55	11-28
77 Roellen	0-12	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	45-65	20-40
	12-38	Clay, silty clay	CH	A-7	0	100	100	95-100	90-100	55-80	30-50
	38-61	Clay, silty clay, silty clay loam.	CH, CL, CL-ML	A-7, A-6, A-4	0	100	95-100	80-100	60-95	20-80	6-50
80 Sharkey	0-6	Silty clay loam	CL	A-6, A-7-6	0	100	100	100	95-100	32-50	11-25
	6-56	Clay	CH	A-7-6, A-7-5	0	100	100	100	95-100	56-85	30-50
	56-72	Clay, silty clay loam, silt loam.	CL, CH	A-6, A-7-6, A-7-5	0	100	100	100	95-100	32-85	11-50
81 Sharkey	0-4	Silty clay	CH, CL	A-7-6, A-7-5	0	100	100	100	95-100	46-85	22-50
	4-54	Clay	CH	A-7-6, A-7-5	0	100	100	100	95-100	56-85	30-50
	54-70	Clay, silty clay loam, silt loam.	CL, CH	A-6, A-7-6, A-7-5	0	100	100	100	95-100	32-85	11-50

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
83---------------- Sikeston	0-14	Loam-------------	SM-SC, CL-ML, CL, SC	A-4, A-6	0	100	100	65-95	35-75	15-30	5-15
	14-38	Loam, sandy clay loam, clay loam.	CL	A-6, A-7	0	100	100	80-100	50-85	35-45	20-30
	38-60	Loam, sandy clay loam, sandy loam.	CL, SC	A-6	0	100	100	75-100	40-80	30-40	15-25
85---------------- Wardell	0-9	Loam-------------	SC, CL	A-6	0	100	100	75-100	45-85	25-35	11-20
	9-54	Clay loam, sandy clay loam, loam.	CL	A-6, A-7	0	100	100	80-100	50-85	35-45	20-30
	54-62	Stratified loamy sand to sand.	SM	A-2	0	100	100	50-75	15-30	<15	NP-3
87B--------------- Dubbs	0-15	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	60-90	20-35	3-10
	15-46	Silty clay loam, clay loam, sandy clay loam.	CL	A-6, A-7	0	100	100	100	85-100	35-50	15-25
	46-60	Loam, silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	55-90	20-35	3-14
89---------------- Foley	0-7	Silt loam--------	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	70-100	25-45	5-20
	7-15	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-49	11-25
	15-49	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	18-32
	49-78	Silt loam--------	CL	A-6, A-7	0	100	100	95-100	85-100	30-45	11-20
91---------------- Forestdale	0-4	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	90-100	30-58	12-30
	4-40	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	20-40
	40-60	Silty clay loam, silt loam, very fine sandy loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	75-100	20-50	5-30
93---------------- Collins	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	<30	NP-8
	7-60	Silt loam, silt	ML, CL-ML	A-4	0	100	100	100	90-100	<35	NP-10
95---------------- Farrenburg	0-18	Fine sandy loam	SM, ML	A-4	0	100	100	70-95	40-65	<30	NP-5
	18-58	Clay loam, sandy clay loam, loam.	CL	A-6, A-7	0	100	100	80-100	52-85	35-45	20-30
	58-65	Sandy loam, loamy sand.	SM	A-2, A-4	0	100	100	50-75	15-45	<15	NP-3
97---------------- Zachary	0-31	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	90-100	<27	NP-7
	31-60	Silty clay loam	CL	A-6, A-7-6	0	100	100	100	90-100	30-45	11-23
99---------------- Tuckerman	0-9	Fine sandy loam	ML, SM	A-4	0	100	100	85-95	30-65	<20	NP-3
	9-19	Fine sandy loam, loam.	ML, CL-ML, SM, SM-SC	A-4	0	100	100	85-95	40-65	<25	NP-5
	19-38	Sandy clay loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6	0	100	100	85-95	40-70	20-35	5-15
	38-60	Fine sandy loam, loam.	ML, CL-ML, SM, SM-SC	A-4	0	100	100	85-95	40-65	<25	NP-5

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm3	In/hr	In/in	pH					Pct
1C, 1D----------- Brandon	0-5	12-27	1.20-1.40	0.6-2.0	0.18-0.23	4.5-7.3	Low-----------	0.37	3	5	1-4
	5-32	18-35	1.20-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low-----------	0.28			
	32-60	15-35	1.20-1.45	2.0-6.0	0.05-0.12	4.5-6.5	Low-----------	0.17			
3B, 3C2, 3C3, 3D2, 3D3-------- Loring	0-8	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-7.3	Low-----------	0.49	3	5	.5-2
	8-28	18-35	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43			
	28-52	12-25	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43			
	52-72	10-25	1.30-1.60	0.2-2.0	0.06-0.13	4.5-6.5	Low-----------	0.43			
5C2, 5C3, 5D3, 5F-------------- Memphis	0-12	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.5	Low-----------	0.49	5	5	1-2
	12-58	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49			
	58-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49			
6F*:											
Eustis----------	0-2	2-10	1.35-1.60	6.0-20	0.08-0.10	4.5-6.5	Low-----------	0.10	5	2	.5-2
	2-33	2-10	1.40-1.60	6.0-20	0.05-0.08	4.5-5.5	Low-----------	0.17			
	33-72	2-7	1.45-1.60	6.0-20	0.05-0.07	4.5-5.5	Low-----------	0.17			
Memphis---------	0-12	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	5	1-2
	12-58	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49			
	58-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49			
13B-------------- Askew	0-6	18-27	1.25-1.60	0.6-2.0	0.15-0.24	4.5-7.3	Low-----------	0.37	5	6	1-3
	6-46	20-35	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Moderate-----	0.32			
	46-60	10-25	1.35-1.60	0.6-6.0	0.10-0.24	4.5-6.0	Low-----------	0.24			
15D, 15F--------- Goss	0-6	7-27	1.10-1.30	2.0-6.0	0.06-0.17	4.5-6.0	Low-----------	0.24	2	6	1-2
	6-12	20-30	1.10-1.30	2.0-6.0	0.06-0.10	4.5-6.0	Low-----------	0.24			
	12-60	35-60	1.30-1.50	0.6-2.0	0.04-0.09	4.5-7.3	Moderate-----	0.24			
16C2------------- Shadygrove	0-5	8-27	1.30-1.55	0.6-2.0	0.15-0.24	4.5-5.5	Low-----------	0.37	3	6	.5-1
	5-60	35-60	1.20-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High----------	0.32			
45--------------- Canalou	0-20	4-8	1.45-1.60	6.0-20	0.10-0.12	4.5-6.5	Low-----------	0.17	5	2	1-3
	20-39	8-14	1.50-1.65	2.0-6.0	0.12-0.14	5.1-6.5	Low-----------	0.17			
	39-60	4-8	1.55-1.70	6.0-20	0.05-0.10	5.6-7.3	Low-----------	0.17			
51--------------- Allemands	0-25	---	0.05-0.25	>2.0	0.20-0.50	3.6-7.8	Low-----------	----	---	7	30-85
	25-64	60-95	0.15-1.00	<0.06	0.14-0.18	3.6-7.8	Very high----	0.32			
	50-60	20-95	0.25-1.00	<0.6	0.12-0.18	6.1-8.4	High----------	0.37			
52--------------- Kobel	0-6	30-40	1.25-1.50	0.2-0.6	0.18-0.22	5.1-7.3	Moderate-----	0.43	5	4	1-3
	6-66	35-55	1.15-1.50	<0.06	0.12-0.22	6.1-8.4	Very high----	0.37			
	55-72	30-50	1.20-1.50	0.06-0.2	0.14-0.22	6.6-8.4	High----------	0.37			
55--------------- Amagon	0-7	18-25	1.25-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low-----------	0.43	5	6	---
	7-59	20-35	1.25-1.50	0.06-0.2	0.16-0.24	4.5-6.0	Moderate-----	0.37			
	59-69	20-35	1.25-1.60	0.06-0.6	0.15-0.24	5.1-7.3	Low-----------	0.43			
57B2------------- Bosket	0-15	5-15	1.30-1.50	2.0-6.0	0.10-0.15	5.1-7.3	Low-----------	0.24	5	3	.5-2
	15-37	18-30	1.25-1.50	0.6-2.0	0.10-0.20	5.1-7.3	Low-----------	0.32			
	37-66	8-15	1.30-1.50	2.0-6.0	0.10-0.15	5.1-6.5	Low-----------	0.32			
57C3, 57D3------- Bosket	0-4	5-15	1.30-1.50	2.0-6.0	0.10-0.15	5.1-7.3	Low-----------	0.24	5	3	.5-2
	4-35	18-30	1.25-1.50	0.6-2.0	0.10-0.20	5.1-7.3	Low-----------	0.32			
	35-60	4-15	1.30-1.60	>2.0	0.02-0.15	5.1-6.5	Low-----------	0.24			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH					Pct
59B---------------- Broseley	0-27	8-12	1.40-1.50	6.0-20	0.09-0.12	5.1-7.8	Low-----------	0.17	5	2	.5-1
	27-50	12-20	1.45-1.55	2.0-6.0	0.12-0.16	5.1-6.5	Low-----------	0.24			
	50-63	8-15	1.45-1.65	2.0-6.0	0.08-0.14	5.1-6.5	Low-----------	0.17			
61---------------- Calhoun	0-18	10-27	1.30-1.65	0.2-0.6	0.21-0.23	4.5-6.0	Low-----------	0.49	5	6	.5-4
	18-65	10-35	1.30-1.70	0.06-0.2	0.20-0.22	4.5-5.5	Moderate------	0.43			
63---------------- Commerce	0-11	14-27	1.35-1.65	0.6-2.0	0.21-0.23	5.6-7.8	Low-----------	0.37	5	6	.5-2
	11-28	14-39	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate------	0.32			
	28-68	14-60	1.35-1.75	0.2-2.0	0.20-0.23	6.6-8.4	Low-----------	0.37			
64---------------- Convent	0-8	0-18	1.30-1.65	0.6-2.0	0.18-0.23	5.6-8.4	Low-----------	0.43	5	5	.5-2
	8-66	0-18	1.30-1.65	0.6-2.0	0.20-0.23	6.1-8.4	Low-----------	0.37			
65---------------- Crowley	0-9	10-27	1.30-1.65	0.2-0.6	0.20-0.23	4.5-8.4	Low-----------	0.43	5	6	2-4
	9-72	35-50	1.20-1.80	<0.06	0.19-0.21	4.5-8.4	High----------	0.32			
67---------------- Dundee	0-10	5-18	1.30-1.70	0.6-2.0	0.15-0.20	4.5-8.4	Low-----------	0.37	5	5	.5-1
	10-60	18-34	1.30-1.80	0.2-0.6	0.15-0.20	4.5-6.0	Moderate------	0.32			
68---------------- Waverly	0-8	6-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43	5	5	1-3
	8-63	10-18	1.40-1.55	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43			
69---------------- Falaya	0-36	6-18	1.25-1.45	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.49	5	5	.5-3
	36-75	6-32	1.25-1.50	0.06-2.0	0.14-0.22	4.5-5.5	Low-----------	0.43			
71---------------- Gideon	0-7	15-35	1.20-1.40	0.2-0.6	0.17-0.22	6.1-7.8	Low-----------	0.28	5	6	2-4
	7-63	20-35	1.25-1.45	0.2-0.6	0.15-0.18	6.1-7.8	Moderate------	0.32			
73---------------- Lilbourn	0-13	10-15	1.35-1.50	2.0-6.0	0.13-0.18	5.6-7.3	Low-----------	0.24	5	3	.5-2
	13-55	12-15	1.40-1.50	2.0-6.0	0.10-0.18	5.6-7.3	Low-----------	0.24			
	55-61	5-18	1.50-1.60	2.0-20	0.07-0.16	5.1-6.5	Low-----------	0.24			
74B--------------- Malden	0-14	4-8	1.45-1.60	6.0-20	0.02-0.06	5.1-7.3	Very low------	0.17	5	1	1-3
	14-28	5-12	1.50-1.65	6.0-20	0.04-0.10	5.1-6.5	Very low------	0.17			
	28-64	4-8	1.55-1.70	6.0-20	0.02-0.06	5.1-6.5	Very low------	0.17			
75B--------------- Malden	0-14	5-12	1.45-1.60	6.0-20	0.06-0.10	5.1-7.3	Very low------	0.17	5	2	1-3
	14-52	5-12	1.50-1.65	6.0-20	0.04-0.10	5.1-6.5	Very low------	0.17			
	52-70	4-8	1.55-1.70	6.0-20	0.02-0.06	5.1-6.5	Very low------	0.17			
76---------------- Mhoon	0-11	14-27	1.35-1.65	0.6-2.0	0.21-0.23	6.1-7.8	Low-----------	0.43	5	6	.5-2
	11-72	14-39	1.35-1.75	0.06-0.2	0.18-0.22	6.1-8.4	Moderate------	0.37			
77---------------- Roellen	0-12	35-50	1.40-1.55	0.06-0.2	0.15-0.19	5.6-7.8	High----------	0.32	5	4	1-6
	12-38	40-60	1.40-1.55	0.06-0.2	0.14-0.17	5.6-7.8	High----------	0.37			
	38-61	25-60	1.40-1.60	0.06-2.0	0.14-0.20	5.6-7.8	High----------	0.37			
80---------------- Sharkey	0-6	27-35	1.40-1.75	0.2-0.6	0.20-0.22	5.1-8.4	Moderate------	0.37	5	7	.5-2
	6-56	60-90	1.20-1.50	<0.06	0.18-0.20	5.6-8.4	Very high-----	0.28			
	56-72	25-90	1.20-1.75	0.06-0.2	0.18-0.22	6.6-8.4	High----------	0.28			
81---------------- Sharkey	0-4	40-60	1.20-1.50	<0.06	0.18-0.20	5.1-8.4	Very high-----	0.32	5	4	.5-2
	4-54	60-90	1.20-1.50	<0.06	0.18-0.20	5.6-8.4	Very high-----	0.28			
	54-70	25-90	1.20-1.75	0.06-0.2	0.18-0.22	6.6-8.4	High----------	0.28			
83---------------- Sikeston	0-14	12-27	1.25-1.45	0.6-2.0	0.14-0.21	6.1-7.8	Low-----------	0.24	5	5	1-3
	14-38	20-30	1.45-1.55	0.2-0.6	0.15-0.18	6.1-7.8	Moderate------	0.24			
	38-60	18-27	1.45-1.60	0.2-0.6	0.11-0.16	6.1-7.8	Moderate------	0.24			
85---------------- Wardell	0-9	15-27	1.25-1.45	0.2-0.6	0.18-0.22	5.6-7.3	Low-----------	0.37	5	6	.5-2
	9-54	18-35	1.45-1.55	0.06-0.2	0.15-0.19	4.5-6.5	Moderate------	0.37			
	54-62	5-15	1.45-1.60	>6.0	0.05-0.08	5.1-6.5	Low-----------	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Reaction	Shrink-swell potential	Erosion factors		Wind erodi-bility group	Organic matter
								K	T		
	In	Pct	G/cm3	In/hr	In/in	pH					Pct
87B-----Dubbs	0-15	5-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----	0.37	5	5	.5-2
	15-46	20-35	1.45-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37			
	46-60	10-25	1.40-1.50	2.0-6.0	0.20-0.22	4.5-6.0	Low-----	0.37			
89-----Foley	0-7	10-20	1.25-1.60	0.6-2.0	0.13-0.24	4.5-7.3	Low-----	0.43	3	5	.5-2
	7-15	20-35	1.25-1.50	0.2-0.6	0.18-0.24	5.1-7.3	Moderate-----	0.43			
	15-49	20-35	1.25-1.50	<0.06	0.10-0.14	5.1-9.0	Moderate-----	0.43			
	49-78	15-25	1.25-1.50	<0.06	0.10-0.14	6.6-9.0	Low-----	0.49			
91-----Forestdale	0-4	27-38	1.50-1.55	0.2-0.6	0.20-0.22	4.5-6.5	Moderate-----	0.37	5	6	2-4
	4-40	35-60	1.50-1.60	<0.06	0.14-0.18	4.5-6.0	High-----	0.28			
	40-60	10-35	1.45-1.55	0.2-0.6	0.17-0.22	4.5-7.8	Moderate-----	0.37			
93-----Collins	0-7	7-16	1.40-1.50	0.6-2.0	0.16-0.24	4.5-7.3	Low-----	0.43	5	5	.5-2
	7-60	5-18	1.40-1.50	0.6-2.0	0.20-0.24	4.5-5.5	Low-----	0.43			
95-----Farrenburg	0-18	15-20	1.35-1.50	0.6-2.0	0.16-0.22	4.5-7.3	Low-----	0.32	5	3	.5-1
	18-58	20-35	1.40-1.55	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.32			
	58-65	8-18	1.45-1.60	0.6-2.0	0.05-0.15	4.5-6.0	Low-----	0.32			
97-----Zachary	0-31	5-15	1.35-1.65	0.6-2.0	0.21-0.23	4.5-7.3	Low-----	0.49	5	5	.5-2
	31-60	27-35	1.35-1.65	0.06-0.2	0.20-0.22	4.5-6.0	Moderate-----	0.43			
99-----Tuckerman	0-9	5-18	1.30-1.60	0.6-2.0	0.11-0.15	4.5-6.0	Low-----	0.24	5	3	.5-2
	9-19	10-25	1.30-1.60	0.6-2.0	0.11-0.20	4.5-6.0	Low-----	0.24			
	19-38	18-35	1.30-1.60	0.2-0.6	0.12-0.20	4.5-6.0	Low-----	0.32			
	38-60	10-25	1.30-1.60	0.6-2.0	0.11-0.20	4.5-6.0	Low-----	0.24			

* See description of this map unit in the text for its composition and behavior characteristics.

TABLE 17.--SOIL AND WATER FEATURES

[See text for definition of terms. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
1C, 1D------------ Brandon	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High.
3B, 3C2, 3C3, 3D2, 3D3-------------- Loring	C	None---------	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
5C2, 5C3, 5D3, 5F- Memphis	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
6F*:											
Eustis-----------	A	None---------	---	---	>6.0	---	---	>60	---	Low-------	High.
Memphis----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
13B-------------- Askew	C	None---------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High------	Moderate.
15D, 15F---------- Goss	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
16C2-------------- Shadygrove	C	None---------	---	---	2.0-4.0	Perched	Dec-May	>60	---	High------	High.
45---------------- Canalou	B	Rare---------	---	---	2.0-3.0	Apparent	Jan-May	>60	---	Low-------	Moderate.
51---------------- Allemands	D	Rare---------	---	---	+1-3.0	Apparent	Jan-Dec	>60	---	High------	Moderate.
52---------------- Kobel	D	Occasional	Brief to very long.	Oct-May	0-1.0	Perched	Dec-Apr	>60	---	High------	Moderate.
55---------------- Amagon	D	Rare---------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High------	High.
57B2, 57C3, 57D3-- Bosket	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
59B--------------- Broseley	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
61---------------- Calhoun	D	None---------	---	---	0-2.0	Perched	Dec-Apr	>60	---	High------	Moderate.
63---------------- Commerce	C	Rare---------	---	---	1.5-4.0	Apparent	Dec-Apr	>60	---	High------	Low.
64---------------- Convent	C	Rare---------	---	---	1.5-4.0	Apparent	Dec-Apr	>60	---	High------	Low.
65---------------- Crowley	D	None---------	---	---	0.5-1.5	Perched	Dec-Apr	>60	---	High------	Moderate.
67---------------- Dundee	C	None---------	---	---	1.5-3.5	Apparent	Jan-Apr	>60	---	High------	Moderate.
68---------------- Waverly	B/D	Occasional	Brief to long.	Jan-Mar	0.5-1.0	Apparent	Dec-Apr	>60	---	High------	Moderate.
69---------------- Falaya	D	Occasional	Brief to long.	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	>60	---	High------	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
71------------------ Gideon	C	Occasional	Brief------	Feb-May	0-1.0	Apparent	Nov-Apr	>60	---	High------	Low.
73------------------ Lilbourn	B	Rare---------	---	---	0-2.0	Perched	Nov-Apr	>60	---	Moderate	High.
74B, 75B----------- Malden	A	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
76------------------ Mhoon	D	Occasional	Brief to long.	Dec-Jul	0-3.0	Apparent	Dec-Apr	>60	---	High------	Low.
77------------------ Roellen	D	Occasional	Brief------	Jan-May	0-1.0	Apparent	Jan-May	>60	---	High------	Low.
80, 81-------------- Sharkey	D	Occasional	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Apr	>60	---	High------	Low.
83------------------ Sikeston	B/D	Occasional	Long-------	Mar-Jun	0-1.5	Perched	Jan-May	>60	---	High------	Low.
85------------------ Wardell	C	Rare---------	---	---	0-1.5	Perched	Nov-Apr	>60	---	High------	Moderate.
87B----------------- Dubbs	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
89------------------ Foley	D	None---------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High------	Low.
91------------------ Forestdale	D	Occasional	Brief to long.	Jan-Apr	0.5-2.0	Apparent	Jan-Apr	>60	---	High------	Moderate.
93------------------ Collins	C	Occasional	Brief to very long.	Jan-Apr	2.0-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
95------------------ Farrenburg	B	Rare---------	---	---	2.0-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate.
97------------------ Zachary	C	Occasional	Brief to long.	Jan-Dec	0.5-1.5	Apparent	Dec-Apr	>60	---	High------	Moderate.
99------------------ Tuckerman	D	Occasional	Brief to long.	Dec-Apr	0-1.0	Perched	Dec-Apr	>60	---	High------	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOIL

Soil name	Family or higher taxonomic class
Allemands	Clayey, montmorillonitic, euic, thermic Terric Medisaprists
Amagon	Fine-silty, mixed, thermic Typic Ochraqualfs
Askew	Fine-silty, mixed, thermic Aquic Hapludalfs
Bosket	Fine-loamy, mixed, thermic Mollic Hapludalfs
Brandon	Fine-silty, mixed, thermic Typic Hapludults
Broseley	Loamy, mixed, thermic Arenic Hapludalfs
Calhoun	Fine-silty, mixed, thermic Typic Glossaqualfs
Canalou	Coarse-loamy, mixed, thermic Aquic Dystric Eutrochrepts
Collins	Coarse-silty, mixed, acid, thermic Aquic Udifluvents
Commerce	Fine-silty, mixed, nonacid, thermic Aeric Fluvaquents
Convent	Coarse-silty, mixed, nonacid, thermic Aeric Fluvaquents
Crowley	Fine, montmorillonitic, thermic Typic Albaqualfs
Dubbs	Fine-silty, mixed, thermic Typic Hapludalfs
Dundee	Fine-silty, mixed, thermic Aeric Ochraqualfs
*Eustis	Sandy, siliceous, thermic Psammentic Paleudults
Falaya	Coarse-silty, mixed, acid, thermic Aeric Fluvaquents
Farrenburg	Fine-loamy, mixed, thermic Aquic Hapludalfs
Foley	Fine-silty, mixed, thermic Albic Glossic Natraqualfs
Forestdale	Fine, montmorillonitic, thermic Typic Ochraqualfs
Gideon	Fine-loamy, mixed, nonacid, thermic Mollic Fluvaquents
Goss	Clayey-skeletal, mixed, mesic Typic Paleudalfs
Kobel	Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Lilbourn	Coarse-loamy, mixed, nonacid, thermic Aeric Fluvaquents
*Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Malden	Mixed, thermic Typic Udipsamments
Memphis	Fine-silty, mixed, thermic Typic Hapludalfs
Mhoon	Fine-silty, mixed, nonacid, thermic Typic Fluvaquents
Roellen	Fine, montmorillonitic, thermic Vertic Haplaquolls
Shadygrove	Fine, montmorillonitic, thermic Typic Hapludalfs
Sharkey	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Sikeston	Fine-loamy, mixed, thermic Cumulic Haplaquolls
Tuckerman	Fine-loamy, mixed, thermic Typic Ochraqualfs
Wardell	Fine-loamy, mixed, thermic Mollic Ochraqualfs
Waverly	Coarse-silty, mixed, acid, thermic Typic Fluvaquents
Zachary	Fine-silty, mixed, thermic Typic Albaqualfs

* In Stoddard County, this soil is a taxadjunct to the series. See text for description of its characteristics that are outside the range of the series.

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