SOIL SURVEY OF

Kankakee County, Illinois

United States Department of Agriculture
Soil Conservation Service

In cooperation with
Illinois Agricultural Experiment Station

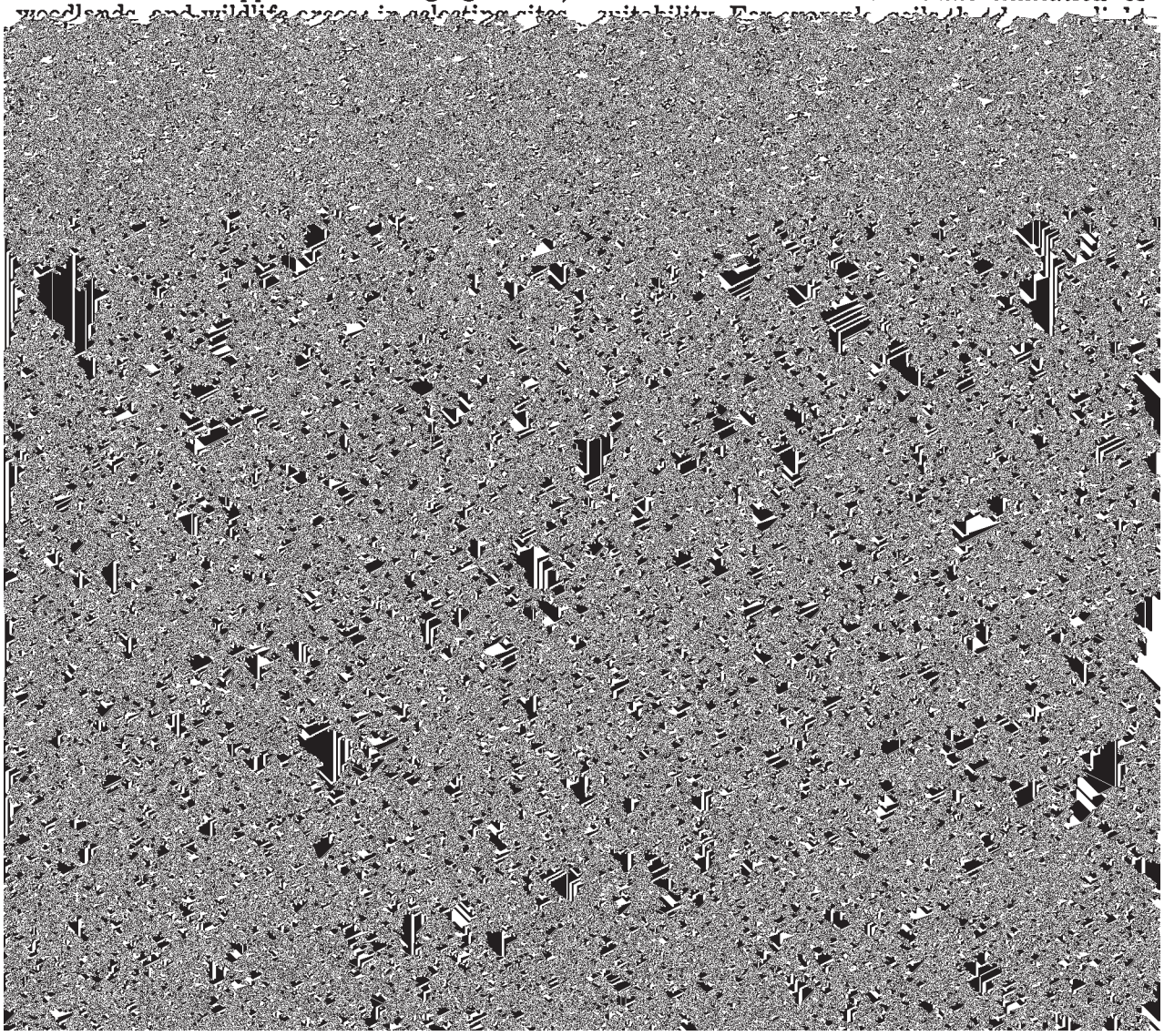
This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1969 to 1973. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1973. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Kankakee County, Illinois, Soil and Water Conservation District. The cost was shared by the Kankakee County Board.

Soil maps in this area may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale. This soil survey is Illinois Agricultural Experiment Station Number 105.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, woodlands, and wildlife areas; in selecting sites an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that are well



Contents

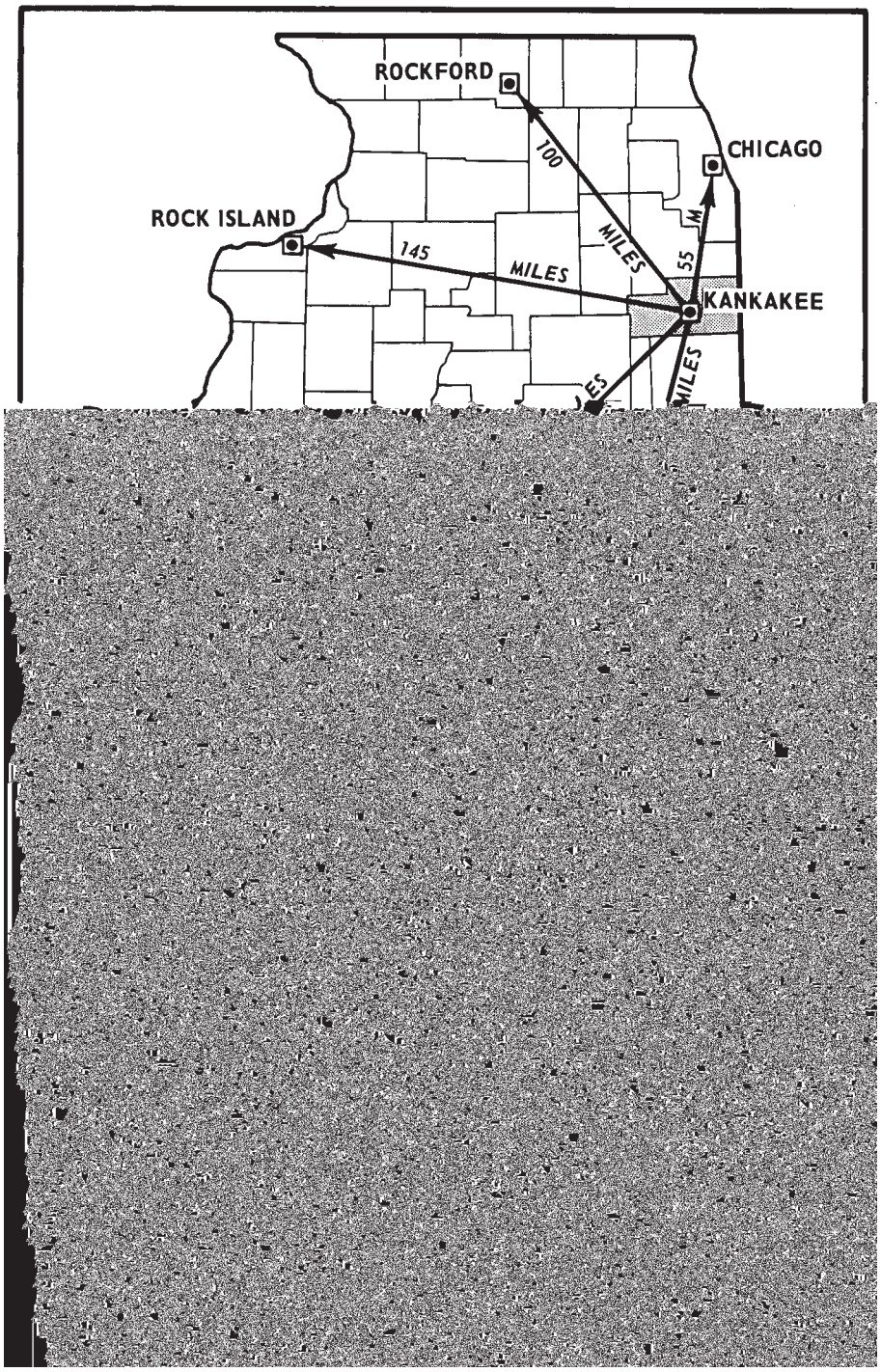
	Page
Index to mapping units	II
[illegible]	III
Elliott series	18
Faxon series	19

Index to Mapping Units

	Page
49—Watseka loamy fine sand	39
69—Milford silty clay loam	27
88B—Sparta loamy fine sand, 1 to 5 percent slopes	37
89—Maumee loamy fine sand	26
98B—Ade loamy fine sand, 1 to 5 percent slopes	9
100—Palms muck	31
107—Sawmill silty clay loam	35
125—Selma loam	36
R125—Selma loam, bedrock substratum	36
131B—Alvin fine sandy loam, 1 to 4 percent slopes	11
131C2—Alvin fine sandy loam, 4 to 10 percent slopes, eroded	11
131F—Alvin fine sandy loam, 12 to 30 percent slopes	11
146A—Elliott silt loam, 0 to 2 percent slopes	18
146B—Elliott silt loam, 2 to 4 percent slopes	18
150A—Onarga fine sandy loam, 0 to 2 percent slopes	31
150B—Onarga fine sandy loam, 2 to 4 percent slopes	31
172—Hoopeston fine sandy loam	22
188—Beardstown silt loam	13
189—Martinton silt loam	26
194B—Morley silt loam, 2 to 4 percent slopes	28
194C—Morley silt loam, 4 to 10 percent slopes	29
194E2—Morley silt loam, 12 to 25 percent slopes, eroded	29
194C3—Morley soils, 5 to 12 percent slopes, severely eroded	29
201—Gilford fine sandy loam	21
W201—Gilford fine sandy loam, wet	21
210—Lena muck	24
223B—Varna silt loam, 1 to 4 percent slopes	38
223C3—Varna soils, 4 to 7 percent slopes, severely eroded	38
232—Ashkum silty clay loam	12
235—Bryce silty clay	15
240A—Plattville silt loam, 0 to 2 percent slopes	32
240B—Plattville silt loam, 2 to 4 percent slopes	33
293—Andres silt loam	12
294A—Symerton silt loam, 0 to 2 percent slopes	37
294B—Symerton silt loam, 2 to 4 percent slopes	37
295—Mokena loam	28
298A—Beecher silt loam, 0 to 2 percent slopes	14
298B—Beecher silt loam, 2 to 4 percent slopes	14
311B—Ritchey silt loam, 2 to 6 percent slopes	34
311D—Ritchey silt loam, 10 to 15 percent slopes	34
315A—Channahon silt loam, 0 to 2 percent slopes	16
315B—Channahon silt loam, 2 to 4 percent slopes	16
320A—Frankfort silt loam, 0 to 2 percent slopes	20
320B—Frankfort silt loam, 2 to 6 percent slopes	20
330—Peotone silty clay loam	32
380—Fieldon loam	19
440A—Jasper silt loam, 0 to 2 percent slopes	23
440B—Jasper silt loam, 2 to 4 percent slopes	23
493—Bonfield loam	14
494A—Kankakee fine sandy loam, 0 to 2 percent slopes	24
494B—Kankakee fine sandy loam, 2 to 4 percent slopes	24
501—Morocco fine sand	29
503A—Rockton loam, 0 to 2 percent slopes	35
503B—Rockton loam, 2 to 4 percent slopes	35
509A—Whalan loam, 0 to 2 percent slopes	39
509B—Whalan loam, 2 to 4 percent slopes	39
516—Faxon clay loam	19
531B—Markham silt loam, 1 to 4 percent slopes	25
531C2—Markham silt loam, 4 to 7 percent slopes, eroded	25
531C3—Markham soils, 4 to 7 percent slopes, severely eroded	25
594—Reddick clay loam	33
740—Darroch silt loam	18
741B—Oakville fine sand, 1 to 6 percent slopes	30
741D—Oakville fine sand, 7 to 18 percent slopes	30
741F—Oakville fine sand, 18 to 40 percent slopes	30
776—Comfrey soils	17
779B—Chelsea fine sand, 1 to 6 percent slopes	16

Summary of Tables

	Page
Climate	
Temperature and precipitation data (table 1)	2
Probability of freezing temperatures (table 2)	3
Descriptions of the Soils	
Acreage and proportionate extent of the soils (table 3)	10
Crops and Pasture	
Yields per acre of crops and pasture (table 4)	46
Woodland	
Tree planting guide (table 5)	48
Wildlife	
Wildlife habitat potentials (table 6)	50
Engineering	
Building site development (table 7)	54
Construction materials (table 8)	57
Engineering properties and classifications (table 9)	59
Physical and chemical properties (table 10)	64
Soil and water features (table 11)	68
Sanitary facilities (table 12)	71
Water Management	
Water management (table 13)	74
Recreation	
Recreational development (table 14)	76
Classification of Soils	
Classification of the soils (table 15)	81


ROCKFORD
CHICAGO
ROCK ISLAND
KANKAKEE
100
MILES
145
MILES
55
MILES

SOIL SURVEY OF KANKAKEE COUNTY, ILLINOIS

By John E. Paschke

Fieldwork by J. F. Paschke, B. F. Currie, J. M. Reinebach, and

3

and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in the survey area. A soil association is a landscape that has a distinctive pattern of soils in defined proportions. It typically consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in an association can occur in other associations, but in different patterns.

A map showing soil associations is useful to people who want to have a general idea of the soils in a survey area, who want to compare different parts of that area, or who want to locate large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide for broad planning of a watershed, a wooded tract, or a wildlife area or for broad planning of recreational facilities, community developments, and such engineering works as transportation corridors. It is not suitable for detailed planning for management of a farm or field or for selecting the exact location of a road or building or other structure, because the soils within an association ordinarily vary in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in this survey have been grouped into general kinds of landscapes for broad interpretative purposes. Each of the broad groups and the soil associations in them are described on the following pages.

Nearly Level to Moderately Sloping Soils That Formed in Moderately Fine Textured and Fine Textured Glacial Drift

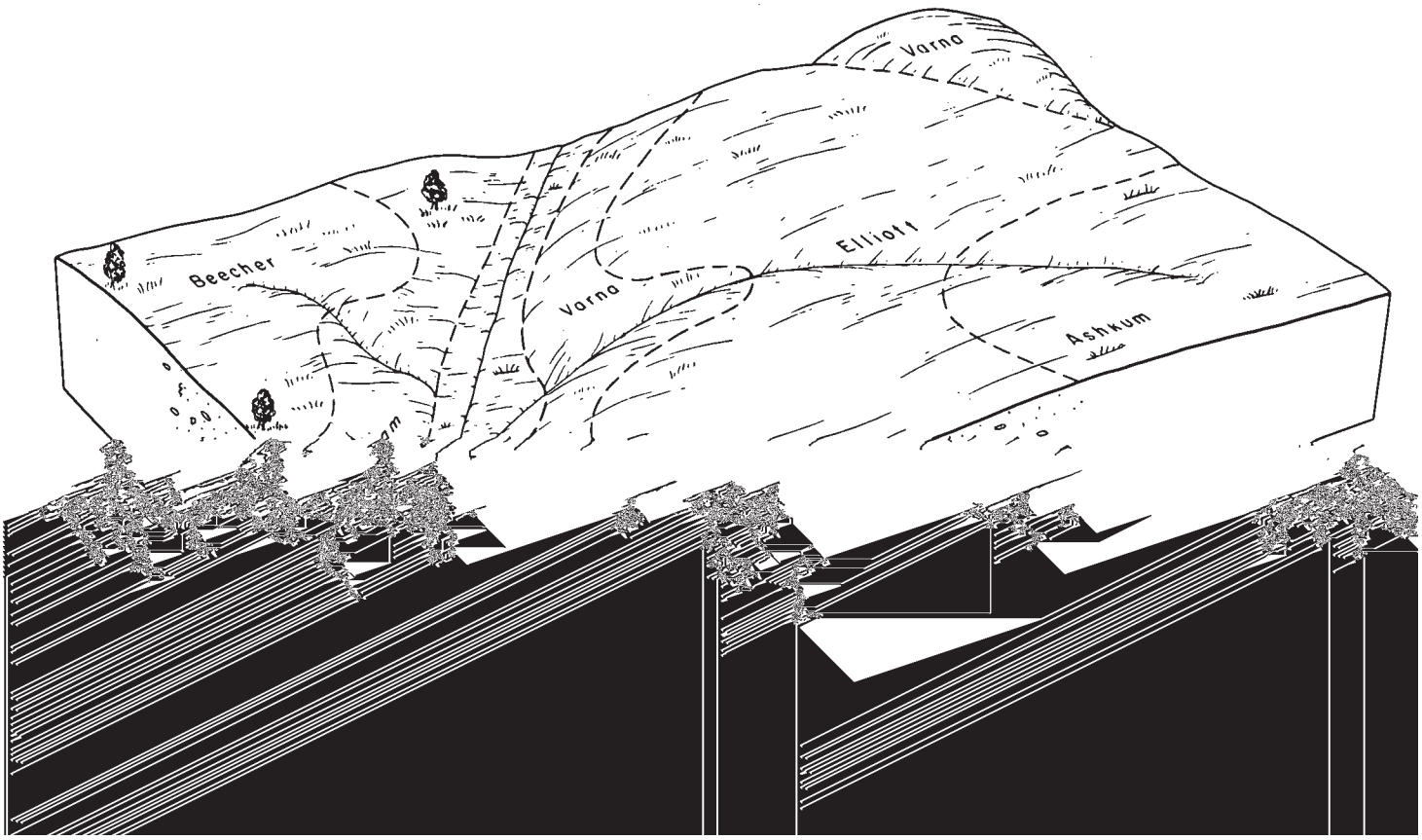
1. Elliott-Varna-Ashkum association

Deep, moderately slowly permeable, nearly level to moderately sloping soils that formed in moderately fine textured glacial till; on glacial moraines

This association consists of nearly level to gently sloping soils on ground moraines where the elevation varies less than 10 feet and nearly level to moderately sloping soils on terminal moraines where the elevation varies as much as 50 feet.

This association makes up about 21 percent of the county. It is about 33 percent Elliott soils, 16 percent Varna soils, 11 percent Ashkum soils, and 40 percent minor soils (fig. 1).

Elliott soils are on ground moraines. They are nearly level to gently sloping and are somewhat poorly drained. Typically, the surface layer is black silt loam about 14 inches thick. The subsoil is about 27 inches thick. It is dark grayish brown heavy silty clay loam in the upper 4 inches, grayish brown silty clay in the



next 7 inches, and brown silty clay loam in the lower 16 inches. The underlying material is brown silty clay loam till.

Varna soils are on terminal moraines. They are nearly level to moderately sloping and are moderately well drained and well drained. Typically, the surface

Martinton, and Markham soils. The poorly drained Ashkum soils are in low-lying areas near Milford soils. Martinton soils are in slightly higher positions on the landscape than Milford soils. Markham soils are in the highest part of the landscape.

This association is used for and well suited to in-

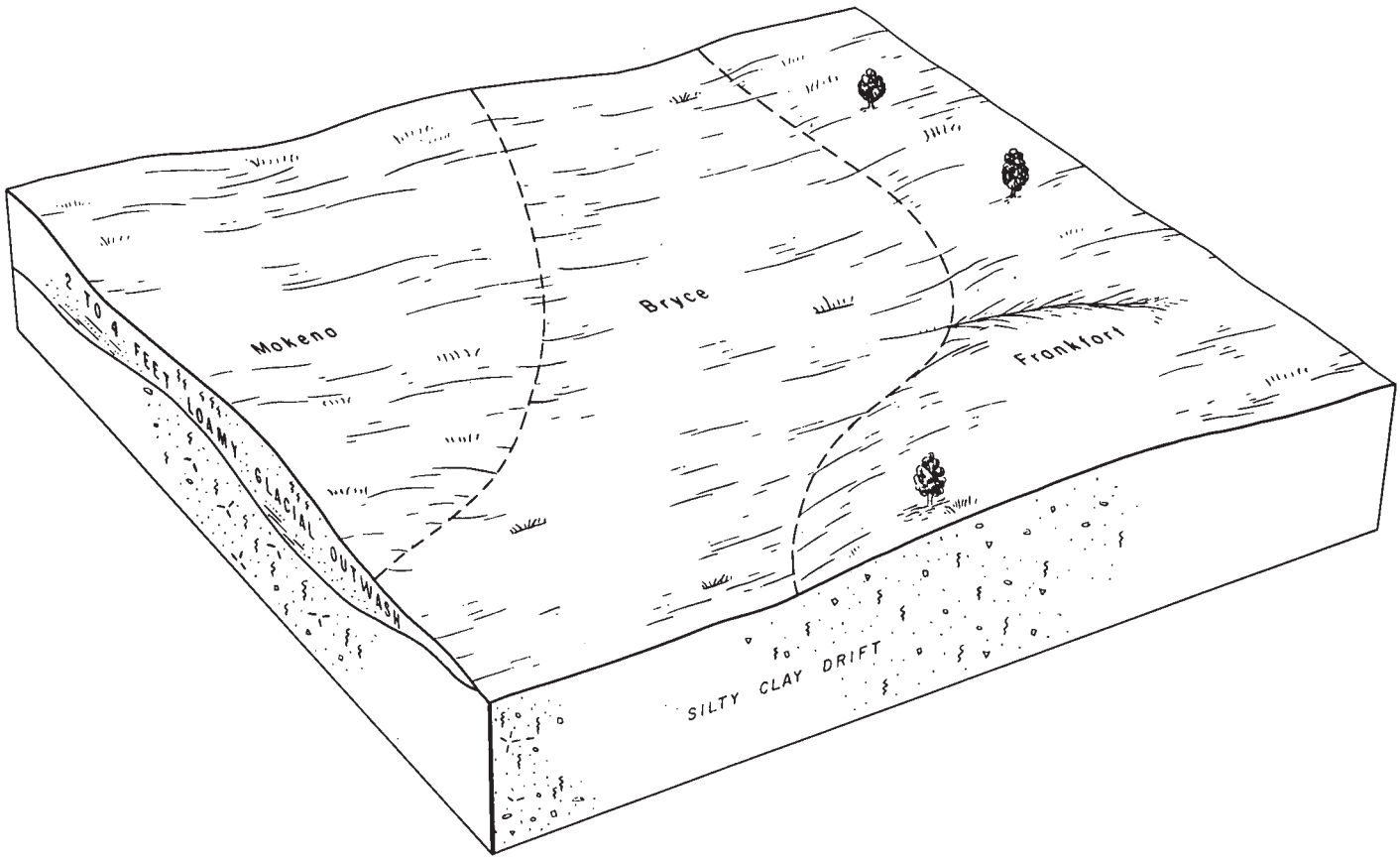


***Figure 2.*—Typical pattern of soils in Bryce-Mokena-Frankfort association.**

formed in medium textured and moderately coarse Jasper soils are on the highest part of the landscape.

sloping soils on broad ground moraines that have very limited relief.

This association makes up 21 percent of the county. It is about 40 percent Andres soils, 36 percent Reddick soils, 13 percent Symerton soils, and 11 percent minor soils.

Andres soils are nearly level and somewhat poorly drained. Typically, the surface layer is black and very dark brown silt loam about 14 inches thick. The subsoil is about 28 inches thick. It is grayish brown and dark grayish brown clay loam in the upper part and grayish brown silty clay loam in the lower part. The underlying material is grayish brown silty clay loam glacial till (fig. 3).

Reddick soils are nearly level and poorly drained. Typically, the surface layer is black and very dark gray clay loam about 13 inches thick. The subsoil is about 34 inches thick. It is dark gray and gray clay loam in the upper part and light gray silty clay loam in the lower part. The underlying material is light gray silty clay loam glacial till.

Symerton soils are nearly level to gently sloping and are moderately well drained and well drained. Typically, the surface layer is black and very dark grayish brown silt loam about 13 inches thick. The subsoil is about 31 inches thick. It is dark brown and dark yellowish brown silty clay loam in the upper part, yellowish brown clay loam in the middle part, and yellowish brown silty clay loam in the lower part. The underlying material is brown silty clay loam glacial till.

Of minor extent in this association are the Elliott and Varna soils. The somewhat poorly drained Elliott soils are adjacent to Andres soils. The moderately well drained Varna soils are near Symerton soils.

This association is well suited to intensive cropping. Corn and soybeans are the main crops. The main concerns of management are providing artificial drainage on Reddick and Andres soils and controlling water erosion on the gently sloping Symerton soils.

Nearly Level to Very Steep Soils That Formed in Coarse Textured and Moderately Coarse Textured Glacial Outwash

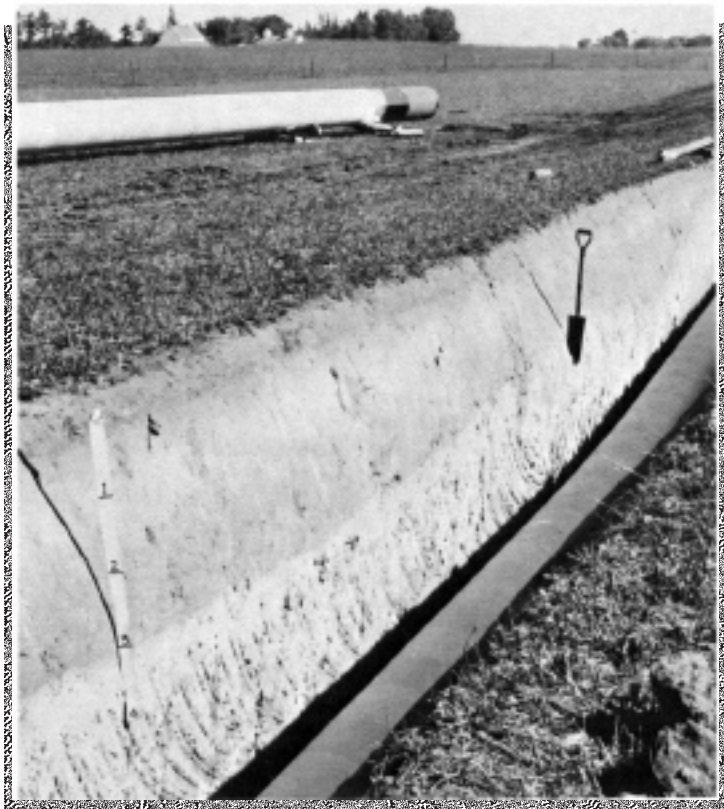
6. *Oakville-Maumee-Watseka association*

Deep, rapidly permeable and very rapidly permeable, nearly level to very steep soils that formed in sandy glacial outwash; on uplands

This association consists mainly of nearly level to very steep soils on broad outwash plains that have prominent sand ridges 10 to 40 feet high.

This association makes up about 12 percent of the county. It is about 30 percent Oakville soils, 26 percent Maumee soils, 19 percent Watseka soils, and 25 percent minor soils.

Oakville soils are on elongated sand ridges. They are nearly level to very steep and are excessively



7. *Gilford-Hoopeston-Ade association*

Deep, moderately rapidly permeable to rapidly permeable, nearly level to gently sloping soils that formed in sandy and loamy glacial outwash; on uplands

This association consists of nearly level to gently sloping soils on broad outwash plains that have low ridges in irregular patterns. The Kankakee and Iroquois Rivers flow through these areas, and they lack distinctive flood plains.

This association makes up about 20 percent of the county. It is about 39 percent Gilford soils, 20 percent Hoopeston soils, 15 percent Ade soils, and 26 percent minor soils.

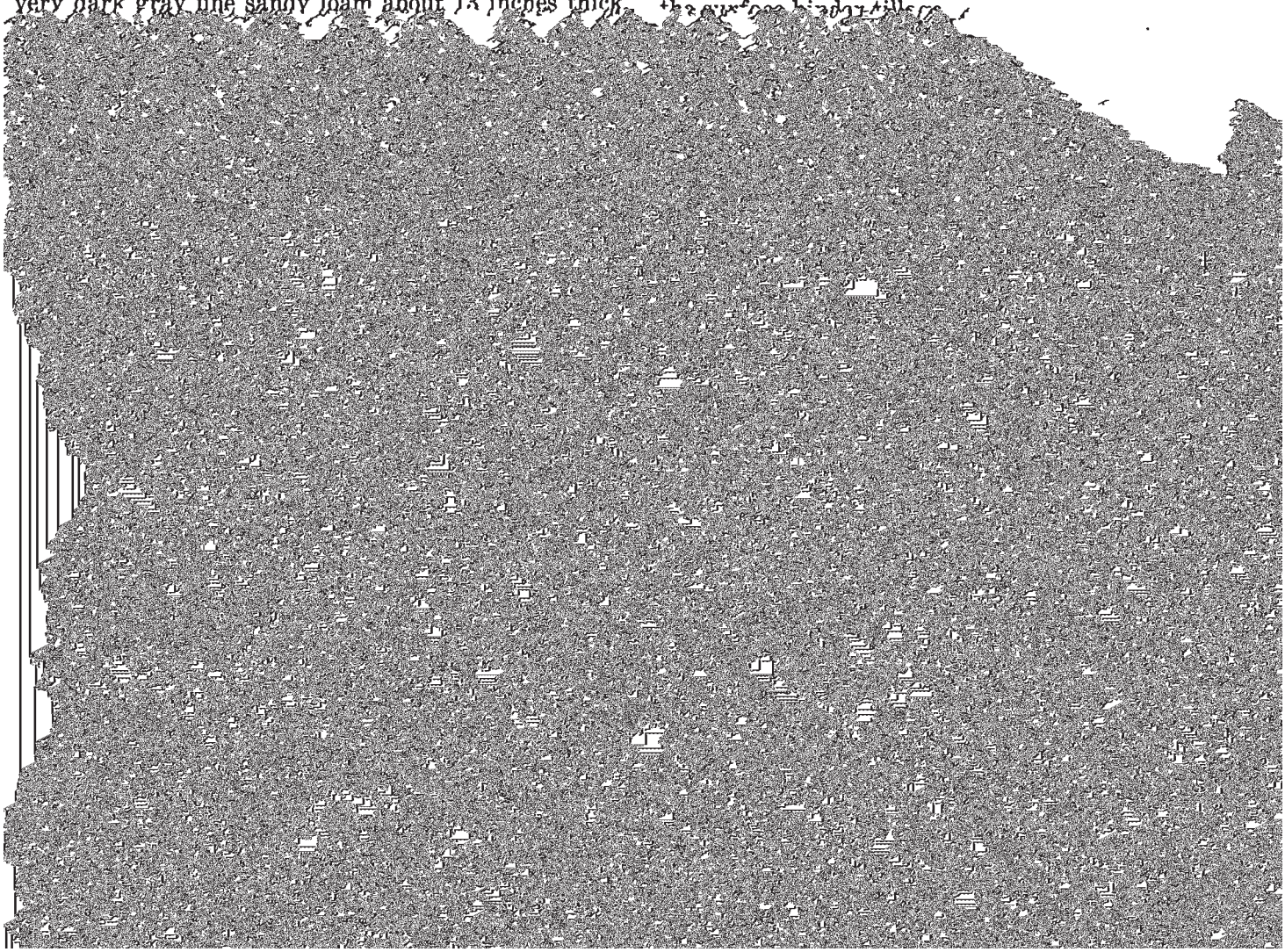
Gilford soils are nearly level and very poorly drained. Typically, the surface layer is black and very dark gray fine sandy loam about 16 inches thick. The subsoil is about 21 inches thick. It is gray sandy clay loam in the upper part, gray fine sandy loam in the middle part, and gray loamy fine sand in the lower part. The underlying material is gray loamy fine sand.

Hoopeston soils are nearly level and somewhat poorly drained. Typically the surface layer is black and very dark gray fine sandy loam about 13 inches thick. [illegible] drained. Typically, the surface layer is black loam and very dark brown fine sandy loam about 14 inches thick. The subsoil is about 12 inches thick. It is yellowish brown fine sandy loam in the upper part and yellowish brown very cobbly fine sandy loam in the lower part. The underlying material is very pale brown and brownish yellow very cobbly fine sandy loam.

Kankakee soils are nearly level to gently sloping and are moderately well drained and well drained. Typically, the surface layer is very dark gray fine sandy loam about 9 inches thick. The subsoil is about 18 inches thick. It is brown and yellowish brown fine sandy loam and sandy clay loam in the upper part and brownish yellow very cobbly loam in the lower part. The underlying material is brownish yellow and very pale brown very cobbly fine sandy loam.

Of minor extent in this association are the Fieldon and Gilford soils. They are poorly drained and are on the lowest part of the landscape.

Most of this association is cultivated. It is suited to this use if it is protected from soil blowing and if artificial drainage is provided on the somewhat poorly drained and poorly drained soils. In places cobbles on the surface hinder tillage.



brown clay loam in the upper part, gray clay loam in the middle part, and gray sandy loam in the lower part. The underlying material is light gray and light brownish gray sand. Limestone bedrock is at a depth of 40 to 60 inches.

Of minor extent in this association are the Ritchey, Whalan, and Faxon soils. The well drained, shallow Ritchey soils and moderately deep Whalan soils are on the higher parts of the landscape. The poorly drained, moderately deep Faxon soils are in low-lying areas near Selma, bedrock substratum, soils. Limestone quarries are in this association.

The deep and moderately deep soils are mainly cultivated and are planted to corn and soybeans. Most of the shallow Ritchey soils are in grass or urban uses. The main concerns of management are protecting the gently sloping soils from water erosion and providing drainage on the poorly drained soils.

methods of soil mapping can be obtained from the Soil Survey Manual (*9*).

Ade Series

The Ade series consists of nearly level to gently sloping, somewhat excessively drained soils on mounds or elongated, narrow, sandbarlike ridges that make up the higher parts of the landscape. These soils formed in sandy glacial outwash and wind-reworked material. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark grayish brown loamy fine sand about 14 inches thick. The subsurface layer is dark yellowish brown and yellowish brown fine sand about 27 inches thick. The subsoil, to a depth of about 62 inches, is made up of bands of dark yellowish brown and yellowish brown loamy fine sand separated by thin

TABLE 3.—*Acreage and proportionate extent of the soils*

Map symbol	Soil name	Acres	Percent	Map symbol	Soil name	Acres	Percent
49	Watseka loamy fine sand	9,330	2.1	298B	Beecher silt loam, 2 to 4 percent slopes	3,331	0.8
69	Milford silty clay loam	14,558	3.4	311B	Ritchey silt loam, 2 to 6 percent slopes	754	0.2
88B	Sparta loamy fine sand, 1 to 5 percent slopes	3,762	0.9	311D	Ritchey silt loam, 10 to 15 percent slopes	924	0.2
89	Maumee loamy fine sand	12,581	2.9	315A	Channahon silt loam, 0 to 2 percent slopes	1,176	0.3
98B	Ade loamy fine sand, 1 to 5 percent slopes	15,713	3.6	315B	Channahon silt loam, 2 to 4 percent slopes	631	0.2
100	Palms muck	1,105	0.3	320A	Frankfort silt loam, 0 to 2 percent slopes	802	0.2
107	Sawmill silty clay loam	4,783	1.1				
125	Selma loam	16,364	3.8				

face layers are dark brown fine sandy loam about 12 inches thick. The subsoil is about 32 inches thick. In sequence from the top it is 16 inches of dark brown fine sandy loam, 3 inches of yellowish brown clay loam, 3 inches of dark brown fine sandy loam, and 10 inches of dark brown loamy fine sand. The underlying material is strong brown fine sand.

Permeability is moderately rapid, and the available

131C2—Alvin fine sandy loam, 4 to 10 percent slopes, eroded. This is a moderately sloping to strongly sloping soil on narrow ridges or short side slopes of drainageways. It has a profile similar to the one described as representative of the series, but the surface layer is thinner. In most cultivated areas, material from the subsoil has been mixed with the surface layer.

Included with this soil in mapping are small areas

ture parting to moderate fine and medium subangular blocky; firm; very dark grayish brown (10YR 3/2) coatings on ped faces; slightly acid; gradual smooth boundary.

B23t—30 to 33 inches; grayish brown (2.5Y 5/2) heavy clay loam; common coarse distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; slightly effervescent; moderately alkaline; clear smooth boundary.

IIB3—33 to 42 inches; grayish brown (2.5Y 5/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; strongly effervescent; moderately alkaline; clear wavy boundary.

IIC—42 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak coarse subangular blocky structure parting to massive; firm; strongly effervescent; moderately alkaline.

The A horizon ranges from 10 to 16 inches in thickness. It is black, very dark brown, or very dark gray loam or silt loam. The B horizon is dominantly clay loam but includes sandy clay loam and silty clay loam. In many places a layer of loam or sandy loam is between the upper and lower parts of the B horizon. The IIB3 horizon in the underlying glacial till is silty clay loam and has colors similar to the underlying till. The glacial till is also silty

Representative profile of Ashkum silty clay loam, 24 feet west and 2,628 feet north of the southeast corner of sec. 5, T. 32 N., R. 13 E.

Ap—0 to 9 inches; black (N 2/0) silty clay loam; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

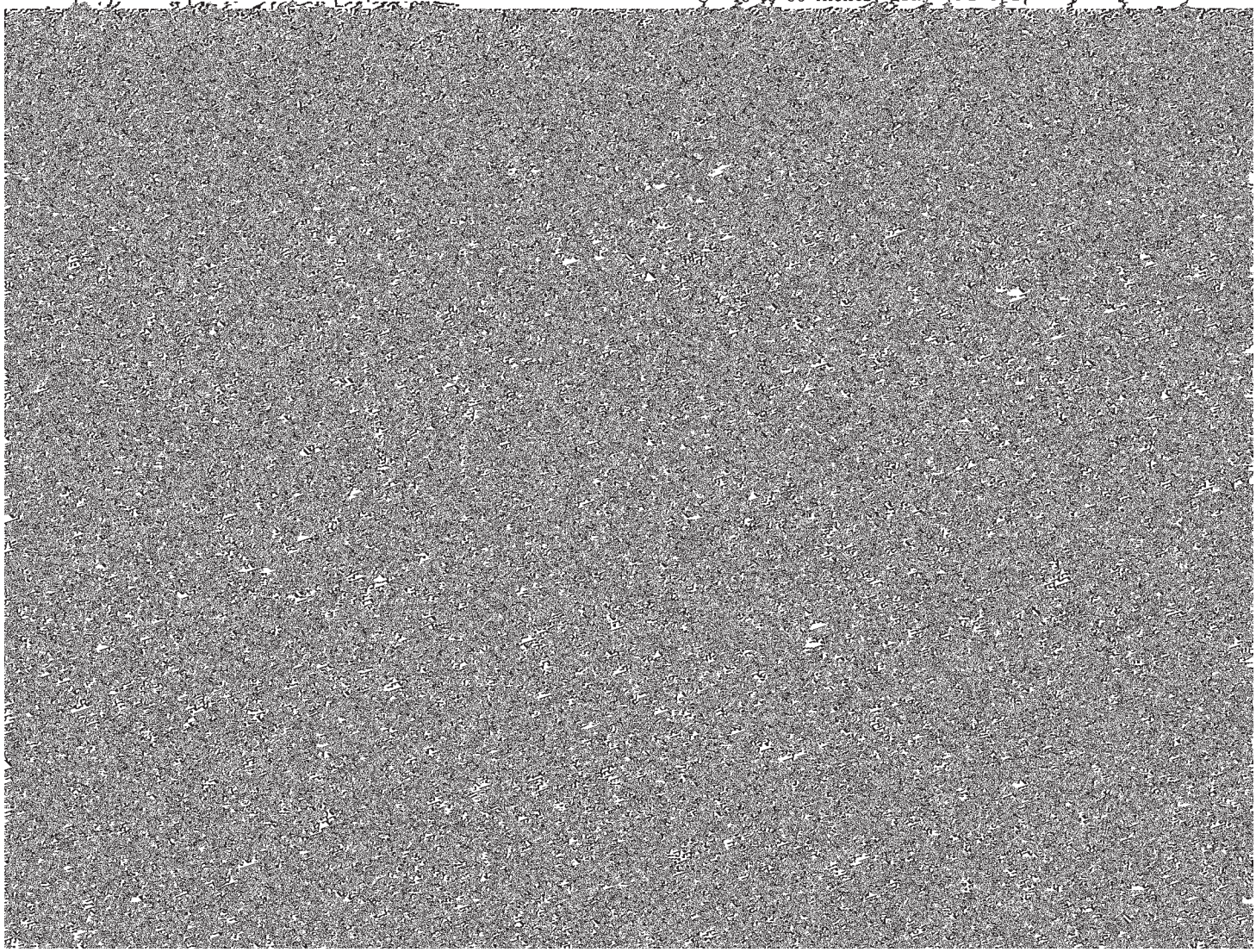
A12—9 to 13 inches; black (10YR 2/1) silty clay loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

B1g—13 to 17 inches; dark gray (10YR 4/1) silty clay loam; few fine faint olive brown (2.5Y 4/4) mottles; moderate very fine subangular blocky structure; firm; black (10YR 2/1) coatings on ped faces; neutral; clear smooth boundary.

B2g—17 to 34 inches; gray (5Y 5/1) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; dark gray (10YR 4/1) coatings on ped faces; neutral; clear smooth boundary.

B3g—34 to 46 inches; gray (5Y 5/1) silty clay loam; many medium prominent yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; discontinuous dark gray (10YR 4/1) coatings on ped faces; slightly effervescent; mildly alkaline; gradual smooth boundary.

C—46 to 60 inches; gray (5Y 5/1) silty clay loam; com-



tion was prairie grasses adapted to wet conditions.

In a representative profile the surface layer is about 8 inches thick. It is very dark grayish brown silt loam that has a high sand content. The subsurface layer is about 6 inches thick. It is grayish brown silt loam that has a high sand content. The subsoil is 36 inches thick. In sequence from the top it is 10 inches of grayish brown silty clay loam that has yellowish brown mottles, 4 inches of light brownish gray loam that has yellowish brown mottles, and 22 inches of light brownish gray loamy fine sand. The underlying material is light brownish gray fine sand glacial outwash.

Permeability and the available water capacity are moderate. The organic-matter content is moderate.

Beardstown soils are used intensively for corn and soybeans. Management is needed to conserve moisture, increase the organic-matter content, and regulate fertility.

Representative profile of Beardstown silt loam, 54 areas where the soil is coarser textured than is described as representative of the series.

This soil is suited to corn, soybeans, and other crops commonly grown in the county. Droughtiness, a seasonal high water table, and the somewhat low natural fertility are limitations to use. Many areas need additional drainage for cultivation early in spring. Drainage should be provided as needed by tiles or open ditches. Management group IIs-2.

Beecher Series

The Beecher series consists of nearly level to gently sloping, somewhat poorly drained soils in the somewhat higher positions on broad plains north and east of Kankakee. These soils formed in thin silty deposits and the underlying glacial till. The native vegetation was mixed grasses and trees.

In a representative profile the surface layer is very

discontinuous very dark gray (10YR 3/1) coatings on ped faces; mildly alkaline; clear smooth boundary.

B3—32 to 37 inches; yellowish brown (10YR 5/6) silty clay loam; many coarse prominent gray (5Y 5/1) mottles; weak coarse prismatic structure parting to weak and moderate medium blocky; firm; discontinuous very dark gray (10YR 3/1) coatings on ped faces; slightly effervescent; moderately alkaline; clear smooth boundary.

C—37 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint yellowish brown (10YR 5/6 and 5/8) mottles and common fine prominent greenish gray (5GY 5/1) mottles; weak coarse prismatic structure parting to massive; firm; strongly effervescent; moderately alkaline.

The A horizon ranges from 10 to 16 inches in thickness. It is silt loam or light silty clay loam. The Ap horizon is very dark gray or very dark grayish brown, and the A2 horizon is dark grayish brown, grayish brown, or brown. The B horizon is silty clay loam or silty clay. The C horizon is silty clay loam and some clay loam, calcareous glacial till.

Beecher soils are associated with Ashkum, Markham, Morley, and Milford soils. Beecher soils are better drained than Milford and Ashkum soils and more poorly drained than Markham and Morley soils.

298A—Beecher silt loam, 0 to 2 percent slopes. This is a nearly level soil on broad plains or in irregularly shaped areas on the more rolling moraines. It has the profile described as representative of the series. Included in mapping are small areas of Markham silt loam, 1 to 4 percent slopes, and Andres silt loam.

A seasonal high water table and the slow permeability are somewhat severe limitations to the use of this soil. Some areas need additional artificial drainage for cultivation early in spring. Tile drains that have surface inlets improve drainage. Management group IIw-4.

298B—Beecher silt loam, 2 to 4 percent slopes. This soil occupies the higher areas or is on short side slopes between better drained and more poorly drained soils. It has a profile similar to the one described as representative of the series, but the subsoil is heavier in texture.

Included with this soil in mapping are small areas [illegible]

In the upper 6 inches it is mottled yellowish brown heavy fine sandy loam, and in the lower 6 inches it is moderately alkaline, yellowish brown, very cobbly fine sandy loam. The underlying material is calcareous, very pale brown and brownish yellow, very cobbly fine sandy loam. The cobbles are dominantly somewhat rounded limestone and average 4 to 6 inches in diameter.

Permeability is moderately rapid, and the available water capacity is moderate. The organic-matter content is moderate.

Most areas of these soils are used intensively for corn and soybeans. Bonfield soils are also well suited to the other commonly grown crops.

Representative profile of Bonfield loam, 36 feet north and 30 feet east of the southwest corner of sec. 34, T. 31 N., R. 10 E.

Ap—0 to 9 inches; black (10YR 2/1) loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

A3—9 to 14 inches; very dark grayish brown (10YR 3/2) heavy fine sandy loam; moderate medium granular structure; friable; continuous black (10YR 2/1) coatings on ped faces; neutral; clear smooth boundary.

B2—14 to 20 inches; yellowish brown (10YR 5/4) heavy fine sandy loam; many fine faint dark grayish brown (10YR 4/2) mottles; weak very fine subangular blocky structure; friable; very dark gray (10YR 3/1) coatings on vertical ped faces; slightly effervescent; mildly alkaline; clear smooth boundary.

IIB3—20 to 26 inches; yellowish brown (10YR 5/4) very cobbly fine sandy loam; weak medium subangular blocky structure; friable; dark grayish brown (10YR 4/2) coatings on ped faces; strongly effervescent; moderately alkaline; gradual smooth boundary.

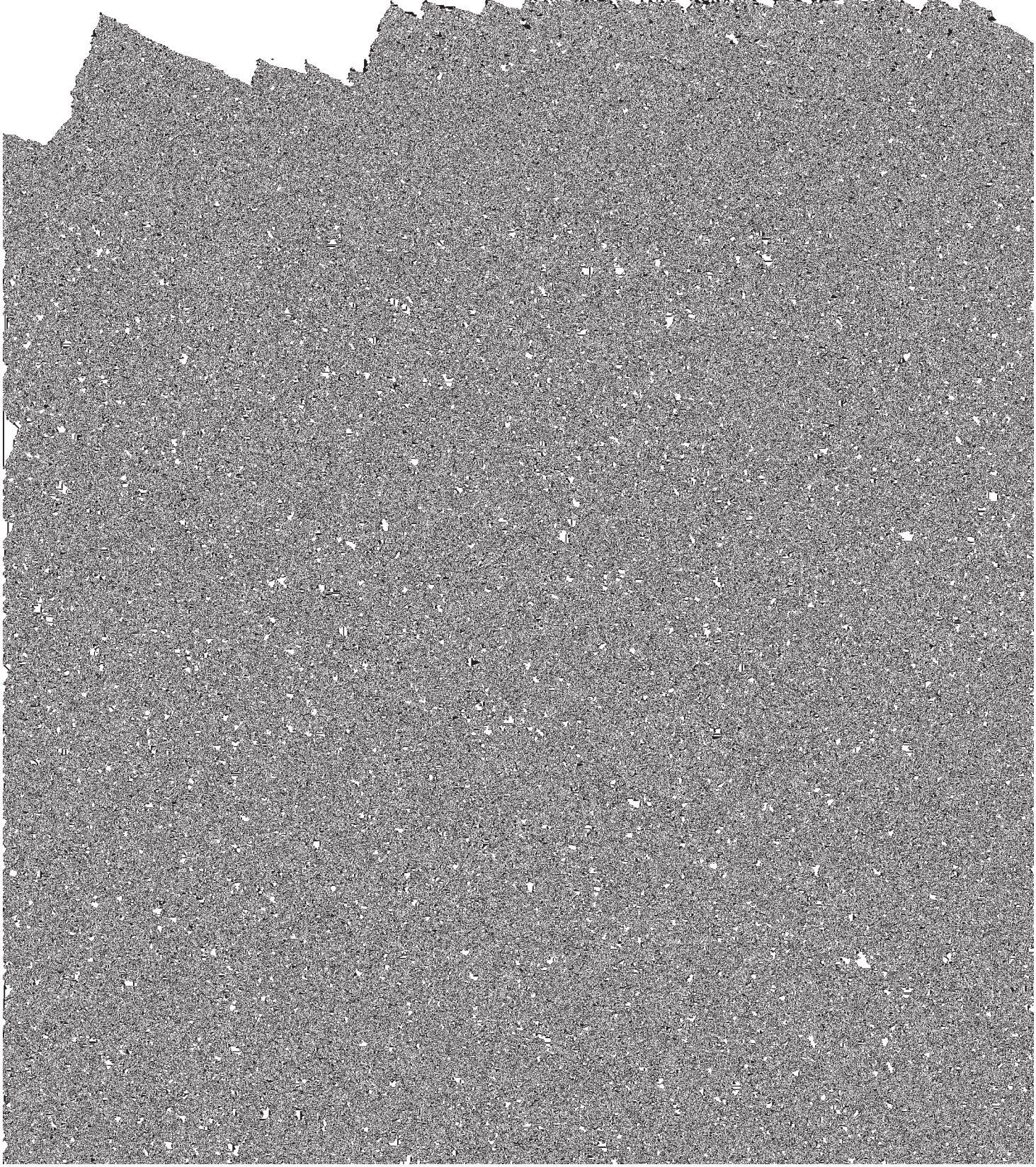
IIC—26 to 50 inches; very pale brown (10YR 7/4) and brownish yellow (10YR 6/6) very cobbly fine sandy loam; single grained; strongly effervescent; moderately alkaline.

The A horizon ranges from 10 to 18 inches in thickness. It is commonly loam but ranges to fine sandy loam and light clay loam. The upper part of the B horizon is mainly heavy fine sandy loam but includes loam and light clay loam. The lower part is cobbly or very cobbly fine sandy loam. The depth to the cobbly material ranges from 15 to 30 inches. The C horizon ranges from a few feet to more [illegible]

Bryce Series

The Bryce series consists of nearly level, poorly

Included with this soil in mapping are small areas of Mokena loam and Frankfort silt loam, 0 to 2 percent slopes. Also included are small areas of Milford



315A—Channahon silt loam, 0 to 2 percent slopes. This is a nearly level soil in somewhat elongated areas of the Kankakee River Valley or near old glacial channels of the Valley. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Rockton loam, 0 to 2 percent slopes, and Channahon silt loam, 2 to 4 percent slopes. Also included are small areas of soils that are less than 10 inches thick to limestone.

This soil is suited to small grain or meadow crops. It has very limited suitability for the other crops because it has a shallow rooting depth. Management group IIIs-3.

315B—Channahon silt loam, 2 to 4 percent slopes. This is a gently sloping soil in somewhat elongated areas where slopes are short.

Included with this soil in mapping are small areas of Rockton loam, 2 to 4 percent slopes; Channahon silt loam, 0 to 2 percent slopes; and Ritchey silt loam, 2 to 6 percent slopes. Also included are small areas of eroded soils and areas of soils that are less than 10 inches thick to bedrock. These eroded and shallow areas are indicated on the soil map by conventional symbols.

This soil is suited to small grain or meadow crops. It is subject to severe erosion when used for row crops. It has very limited suitability for other crops because it is subject to erosion and is shallow to bedrock. Management group IIIs-3.

Chelsea Series

The Chelsea series consists of nearly level to moderately sloping, excessively drained soils in the higher, better drained positions on the landscape. These soils are on mounds or on prominent, narrow, elongated, sandbarlike ridges. They formed in sandy glacial outwash material. The native vegetation was hardwood trees.

In a representative profile the surface layer is dark grayish brown fine sand about 5 inches thick. The subsurface layer is yellowish brown fine sand about 39 inches thick. The subsoil to a depth of 60 inches is brownish yellow fine sand separated by bands of strong brown and brown loamy fine sand (fig. 4).

Permeability is rapid, and the available water capacity is low. The organic-matter content is low.

The gently sloping Chelsea soils are better suited to small grain and meadow crops than to corn and soybeans. The moderately sloping soils are better suited to a permanent cover of meadows or trees. When farmed with surrounding soils, these soils need special protection from soil blowing.

Representative profile of Chelsea fine sand, 1 to 6 percent slopes, 1,298 feet west and 197 feet south of the northeast corner of sec. 30, T. 31 N., R. 11 E.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sand; very weak fine granular structure parting to single grained; loose; slightly acid; clear smooth boundary.

A2—5 to 44 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; medium acid; abrupt smooth boundary.

A&B—44 to 60 inches; brownish yellow (10YR 6/6) fine sand (A22); single grained; loose; strong brown (7.5YR 5/6) and brown (7.5YR 4/4) loamy fine sand (B); weak medium and coarse subangular blocky structure; friable; 1 to 2 inch thick lamellae make up 5 inches of this horizon; medium acid.

Figure 4.—**A profile of Chelsea fine sand with lamellae 4 to 10 feet below the surface.**

The A horizon is fine sand or loamy fine sand. Thickness and color vary with vegetative cover or amount of erosion. The A&B horizon ranges from 2 to 12 feet or more in thickness.

Chelsea soils are better drained and lighter colored than Hoopeston and Gilford soils. They are lighter colored than Ade soils.

779B—Chelsea fine sand, 1 to 6 percent slopes. This is a nearly level to moderately sloping soil on mounds or elongated ridges that are higher than the surrounding, more poorly drained soils. In some areas the bands in the subsoil extend to a depth of less than 60 inches and are terminated by the underlying gray sand or by the water table. Included in mapping are small areas of Ade loamy fine sand, 1 to 5 percent slopes, and Hoopeston fine sandy loam.

The low available water capacity and natural fertility and the risk of soil blowing are serious limitations to the use of this soil. If this soil is used for

crops, conservation tillage and other practices that conserve fertility and moisture are needed. Management group IVs-1.

Comfrey Series

The Comfrey series consists of poorly drained, nearly level soils in depressions and on bottom lands. These soils formed in recent water-laid sediment in glacial outwash areas.

In a representative profile the surface layer is black clay loam about 26 inches thick. The subsoil is 20 inches thick. In the upper 13 inches it is dark gray clay loam that has a few thin strata of loam, and in the lower 7 inches it is gray loam that has a few thin strata of sandy loam. The underlying material is gray, stratified sandy loam and loamy sand.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high.

If adequately drained, Comfrey soils are suited to corn and soybeans. Because of frequent flooding, many areas are in pasture. A severe flooding hazard and a very high water table are the major limitations to use.

Representative profile of Comfrey clay loam from [illegible]

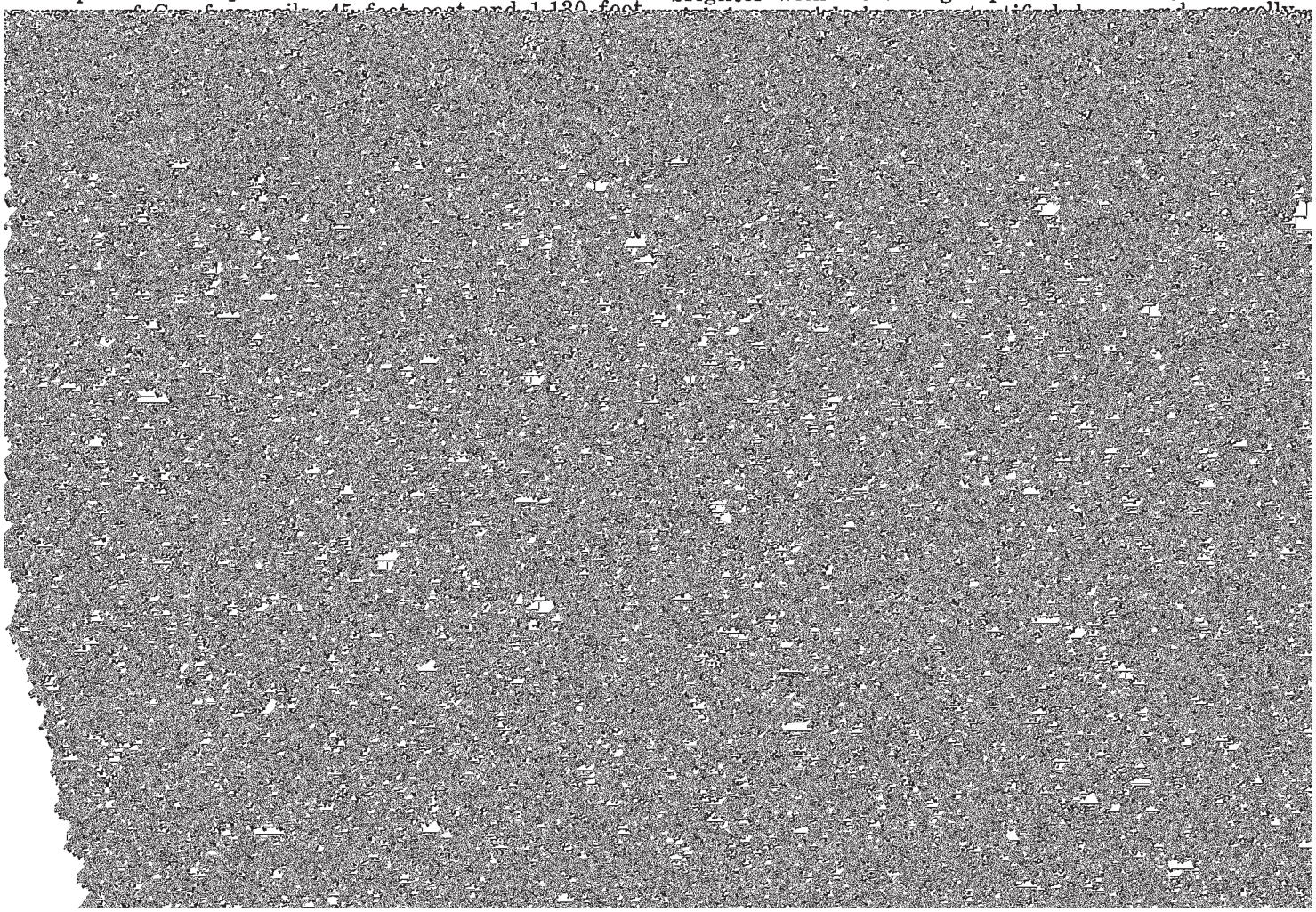
clay loam, and other similar soils. Also included are small areas that are too wet for cultivation.

Most areas of these soils are used for corn and soybeans. Excess water in spring and early in summer commonly causes crop damage. The use of Comfrey soils depends on adequate drainage. If drainage systems cease to function or if the weather is extremely wet, these areas revert to a marshy condition. Providing adequate drainage and maintaining good tilth are necessary for sustained crop production. Management group IIw-1.

Darroch Series

The Darroch series consists of nearly level, somewhat poorly drained soils on glacial outwash plains. These soils formed in medium textured glacial outwash material. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark grayish brown silt loam about 14 inches thick. The subsoil is about 29 inches thick. It is dark grayish brown silty clay loam in the upper part, brown silty clay loam in the middle part, and grayish brown silty clay loam and loam in the lower part. It has yellowish brown mottles that become larger and brighter with increasing depth. The underlying mate-



and 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few dark gray (10YR 4/1) coatings on vertical ped faces; mildly alkaline; clear smooth boundary.

IIB21t—14 to 18 inches; dark grayish brown (10YR 4/2) heavy silty clay loam; many fine faint grayish brown (10YR 5/2) mottles; moderate very fine and fine subangular blocky structure; firm; black (10YR 2/1)

tices. Contour farming and conservation tillage help to reduce soil losses. Management group IIe-2.

Faxon Series

The Faxon series consists of nearly level, moderately deep, poorly drained soils along the Kankakee River Valley. These soils formed in thin deposits of loamy material. Limestone bedrock is 20 to 40 inches below the surface. The native vegetation was water-tolerant prairie grasses and swamp grasses.

In a representative profile the surface layer is black and very dark gray clay loam about 17 inches thick. The subsoil is about 11 inches thick. In the upper 8 inches it is grayish brown clay loam, and in the lower 3 inches it is grayish brown loam. Slightly weathered limestone bedrock is at a depth of 28 inches.

Permeability is moderate above the limestone. The available water capacity is moderate. The organic-matter content is high.

Because of the limited rooting depth, Faxon soils have only limited suitability for corn and soybeans. Where adequately drained, most areas are used for corn and soybeans.

Representative profile of Faxon clay loam, 1,272 feet east and 2,610 feet south of the northwest corner of sec. 35, T. 31 N., R. 11 E.

Ap—0 to 9 inches; black (10YR 2/1) clay loam; moderate fine granular structure; friable; mildly alkaline; abrupt smooth boundary.

A3—9 to 17 inches; very dark gray (10YR 3/1) clay loam; moderate very fine subangular blocky structure; friable; mildly alkaline; clear smooth boundary.

B2g—17 to 25 inches; grayish brown (2.5Y 5/2) clay loam; many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; very dark gray (10YR 3/1) coatings on ped faces; mildly alkaline; clear smooth boundary.

B3g—25 to 28 inches; grayish brown (2.5Y 5/2) loam; many medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; friable; common very dark gray (10YR 3/1) krotovinas; mildly alkaline; abrupt smooth boundary.

IIR—28 inches; light gray (10YR 7/2) slightly weathered limestone bedrock.

Depth to limestone bedrock ranges from 20 to 40 inches. The A horizon ranges from 11 to 18 inches in thickness. [illegible]

limitations to the use of this soil. Runoff is slow. Because this soil is shallow to bedrock, tiling is not always practical, and most cultivated areas are drained by open ditches. Many areas need artificial drainage for cultivation early in spring. Management group IIIw-3.

Fieldon Series

The Fieldon series consists of nearly level, calcareous, poorly drained soils in glacial outwash areas. These soils formed in loamy glacial outwash material that has a concentration of snail shells. The native vegetation was swamp grasses.

In a representative profile the surface layer is black and very dark gray loam and fine sandy loam about 19 inches thick. The subsoil is about 29 inches thick. It is dark grayish brown and grayish brown loam and fine sandy loam that has light olive brown mottles. The underlying material is light olive brown, stratified loamy sand and sand.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high.

Fieldon soils are farmed intensively. If fertilizer is applied in appropriate amounts, these soils are well suited to all the commonly grown crops.

Representative profile of Fieldon loam, 2,275 feet north and 30 feet west of the center of sec. 2, T. 30 N., R. 9 E.

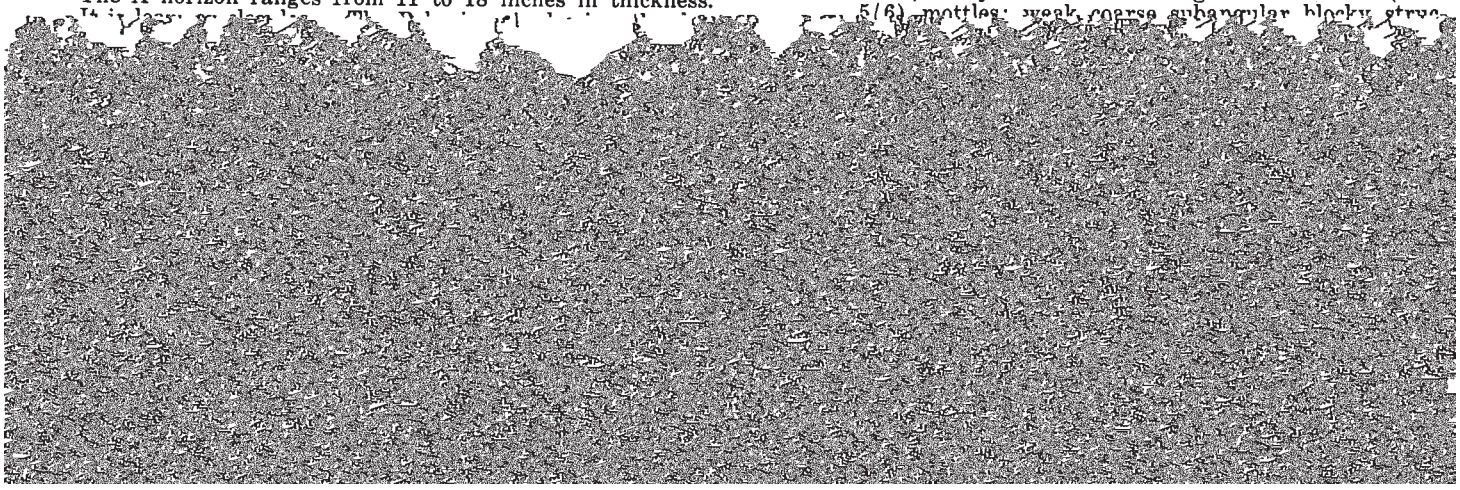
A1—0 to 13 inches; black (10YR 2/1) loam; weak fine granular structure; friable; strongly effervescent; moderately alkaline; clear smooth boundary.

A3—13 to 19 inches; very dark gray (10YR 3/1) heavy fine sandy loam; weak fine granular structure; friable; strongly effervescent; moderately alkaline; clear smooth boundary.

B21g—19 to 22 inches; dark grayish brown (2.5Y 4/2) light loam; few fine distinct light olive brown (2.5Y 5/4) mottles; weak fine subangular blocky structure; friable; discontinuous very dark gray (10YR 3/1) coatings on ped faces; strongly effervescent; moderately alkaline; gradual smooth boundary.

B22g—22 to 40 inches; grayish brown (2.5Y 5/2) loam; few fine distinct light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; friable; common very dark gray (10YR 3/1) krotovinas; strongly effervescent; moderately alkaline; gradual smooth boundary.

B3g—40 to 48 inches; grayish brown (2.5Y 5/2) fine sandy loam; many coarse distinct light olive brown (2.5Y 5/6) mottles; weak coarse subangular blocky stru-



content and small areas of soils that are not calcareous. Also included are small areas where the underlying material is cobbly loamy sand. Wet areas are shown on the soil map by a conventional symbol.

Surface and tile drainage are needed if this soil is to be used for cultivated crops, especially early in spring. Management group IIIw-3.

Frankfort Series

massive; firm; common light gray (10YR 7/1) lime concretions; strongly effervescent; moderately alkaline.

The A horizon ranges from 7 to 14 inches in thickness. It is silt loam that has a high sand content, or it is silty clay loam. The B horizon is dominantly silty clay but in some places is clay or silty clay loam. The lower part of the B horizon and the C horizon are compact silty clay that has variable gray and yellowish brown colors.

Frankfort soils are associated with Bryce and Mokena soils. They are better drained than Bryce soils. Frankfort soils formed in fine textured glacial drift and lakebed material; in Mokena soils the upper part of the solum

yellowish brown mottles; in the middle 7 inches it is gray fine sandy loam that has yellowish brown mottles; and in the lower 6 inches it is gray stratified loamy fine sand. The underlying material is gray, stratified loamy fine sand. It is loose, neutral, glacial outwash material.

Permeability is moderately rapid, and the available needed, and tile drains that are properly protected from being filled with sand help to control the moisture supplied to crops. Conservation tillage is needed to control soil blowing. Management group IIIw-1.

W201—Gilford fine sandy loam, wet. This is a nearly level to depressional soil that is subject to frequent flooding or ponding. Water commonly covers the

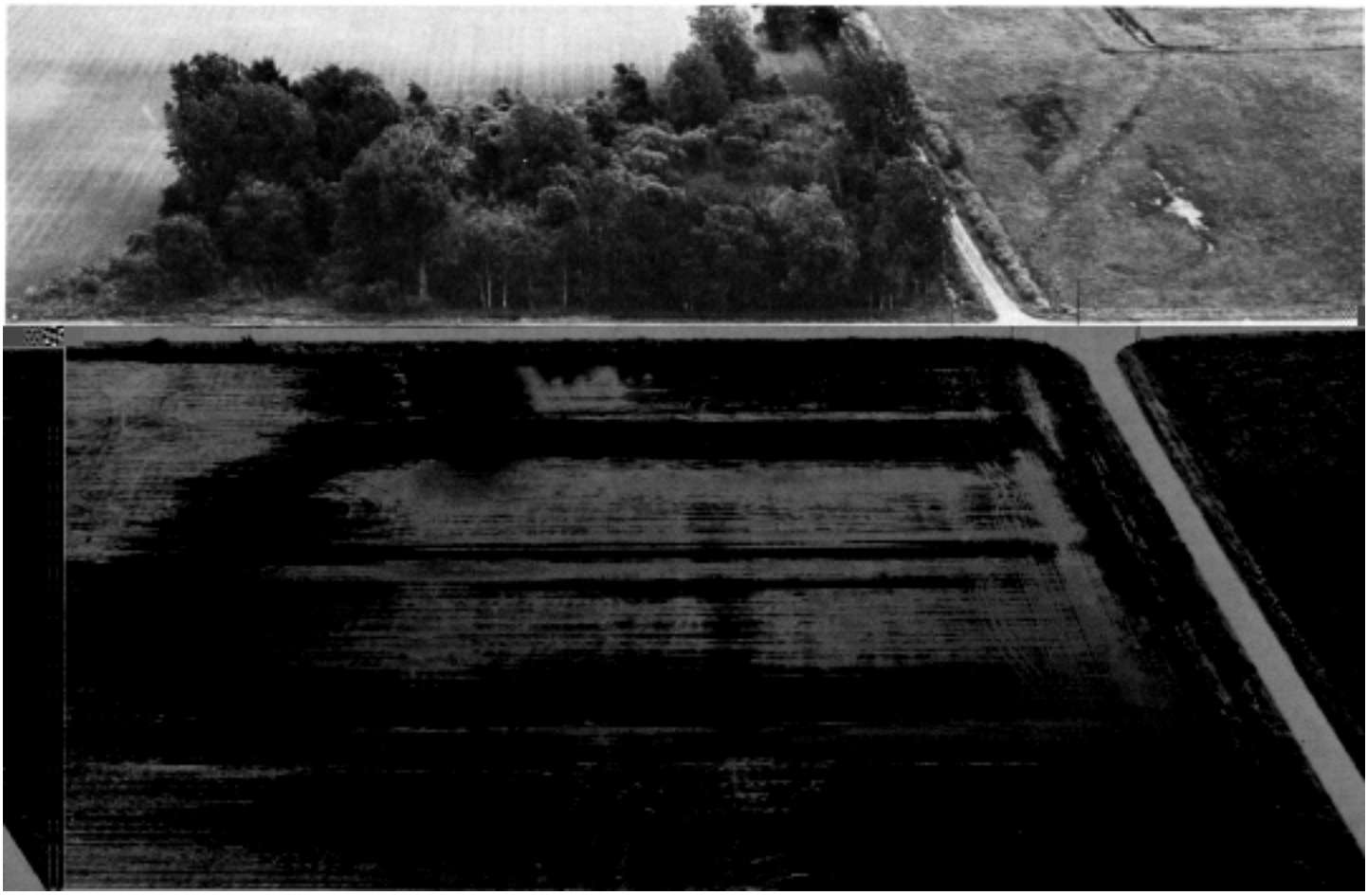


Figure 5.—**Gilford fine sandy loam that has ponded.**

moderate medium subangular blocky; friable; patchy dark gray (10YR 4/1) coatings on ped faces; neutral; clear smooth boundary.

B3—33 to 46 inches; grayish brown (10YR 5/2) stratified fine sandy loam, loamy fine sand, and silt loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; friable; discontinuous dark gray (10YR 4/1) coatings on vertical ped faces; neutral; gradual wavy boundary.

C—46 to 60 inches; gray (5Y 5/1) stratified fine sandy loam, loamy fine sand, and silt loam; many coarse prominent yellowish brown (10YR 5/4) mottles; single grained; very friable; strongly effervescent; moderately alkaline.

The A horizon ranges from 10 to 18 inches in thickness. It is black and very dark gray fine sandy loam that ranges to loam or loamy fine sand. The B horizon ranges from dark grayish brown and grayish brown to brown. The subhorizons that have brown matrix color have grayish brown mottles. The B horizon is dominantly fine sandy loam, but in places it ranges to sandy clay loam or loamy fine sand. The C horizon is variable, stratified glacial outwash material that ranges from fine sand to silt loam.

Hoopeston soils are associated with Ade, Onarga, and Gilford soils. Hoopeston soils are more poorly drained than Ade and Onarga soils and better drained than Gilford soils.

172—Hoopeston fine sandy loam. This is a nearly level soil in irregularly shaped areas that are somewhat higher than the flat surrounding areas.

Included with this soil in mapping are small areas of Gilford fine sandy loam and Watseka loamy fine sand. Also included are areas where the surface layer is thinner than is described as representative of the series.

This soil is well suited to the crops commonly grown in the county. Droughtiness is a problem in some seasons because this soil has moderate available water capacity. In spring a high water table is frequently a limitation. Many areas need artificial drainage for cultivation early in spring. Drainage should be provided as needed by tiles or open ditches. Management practices that increase organic-matter content and prevent soil blowing help to increase the productivity of this soil. Management group IIs-2.

Jasper Series

The Jasper series consists of nearly level to gently sloping, well drained soils in the higher lying, better drained glacial outwash areas. These soils formed in medium textured glacial outwash material. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark grayish brown silt loam about 15 inches

thick. The subsoil is about 30 inches thick. In the upper 7 inches it is dark yellowish brown heavy silt loam; in the middle 16 inches it is dark yellowish brown and dark brown clay loam; and in the lower 7 inches it is brown loam. The underlying material is stratified, dark yellowish brown sandy loam and sand. It is slightly acid to neutral glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate.

Jasper soils are well suited to all the commonly grown crops. They are used intensively for corn and soybeans. Increasing the organic-matter content and protecting sloping areas from erosion are the main concerns of management.

Representative profile of Jasper silt loam, 0 to 2 percent slopes, 72 feet north and 2,388 feet east of the southwest corner of sec. 2, T. 31 N., R. 13 E.

Ap—0 to 10 inches; black (10YR 2/1) silt loam that has a high sand content; moderate very fine granular structure; friable; neutral; abrupt smooth boundary.

A12—10 to 15 inches; very dark grayish brown (10YR 3/2) silt loam that has a high sand content; moderate fine granular structure; friable; discontinuous black (10YR 2/1) coatings on ped faces; slightly acid; clear smooth boundary.

B1—15 to 22 inches; dark yellowish brown (10YR 4/4) silt loam that has a high sand content; moderate very fine subangular blocky structure; friable; continuous

is a gently sloping soil on small rises or on short side slopes surrounded by more poorly drained, nearly level soils. It has a profile similar to the one described as representative of the series, but the surface layer is thinner.

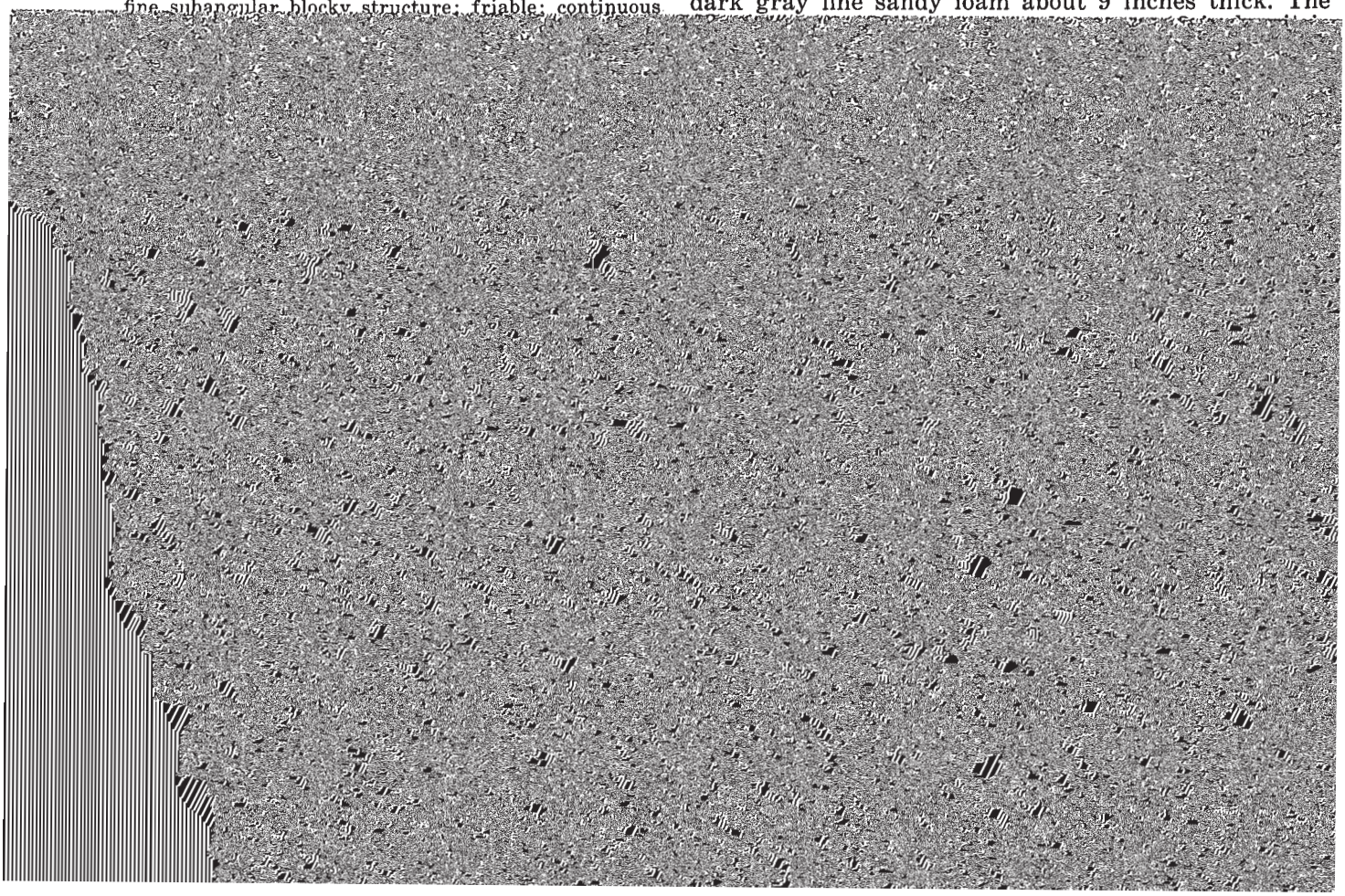
Included with this soil in mapping are small areas of Jasper silt loam, 0 to 2 percent slopes, and areas of eroded soils. Also included are small areas where glacial till, bedrock, or rubble is at a depth of 45 to 60 inches.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard if tillage is up and down the slope. The size and shape of the areas of soil limit the use of some erosion control practices. Contouring and conservation tillage help to reduce soil losses. Management group IIe-1.

Kankakee Series

The Kankakee series consists of nearly level to gently sloping, moderately well drained and well drained soils on high-lying glacial outwash plains. These soils formed in loamy material and the underlying cobbly material. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark gray fine sandy loam about 9 inches thick. The



very pale brown (10YR 7/4) very cobbly fine sandy loam; single grained; very friable; strongly effervescent; moderately alkaline.

The A horizon ranges from 6 to 14 inches in thickness. It is black to dark brown fine sandy loam or loam. The B horizon is dominantly loam, sandy clay loam, or clay loam, but in the lower part it is cobbly or very cobbly fine sandy loam. The depth to the cobbly material ranges from 15 to 40 inches. The C horizon ranges from a few feet to more than 20 feet in thickness. The size and percentage of cobbles in the matrix varies in relation to the distance from the primary source of the limestone.

Kankakee soils are associated with Bonfield and Fieldon soils. Kankakee soils are better drained than these soils.

494A—Kankakee fine sandy loam, 0 to 2 percent slopes. This is a nearly level soil in irregularly shaped areas that are in the somewhat higher, better drained suited to corn and soybeans. Areas that are too wet to cultivate are in pasture, are left idle, or provide cover for wildlife.

Representative profile of Lena muck, 525 feet east and 1,825 feet south of the northwest corner of sec. 3 (175 feet south of quonset barn), T. 31 N., R. 14 E.

Oa1—0 to 26 inches; black (N 2/0) broken faced and rubbed sapric material; about 5 to 15 percent fiber, a trace when rubbed; weak medium granular structure; friable; common snail shell fragments; strongly effervescent; moderately alkaline; clear smooth boundary.

Oa2—26 to 42 inches; black (N 2/0) broken faced and rubbed sapric material; about 15 percent fiber; very weak medium and coarse subangular blocky structure; few snail shell fragments; strongly effervescent; moderately alkaline; clear smooth boundary.

water capacity is moderate. The organic-matter content is moderate.

Most areas of Markham soils are suited to cropping, but the severely eroded Markham soils in moderately sloping areas are only suited to limited cropping. Controlling erosion and increasing the organic-matter content are the main concerns of management.

Representative profile of Markham silt loam, 1 to 4 percent slopes, 10 feet east and 2,588 feet south of the northwest corner of sec. 8, T. 32 N., R. 15 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; moderate very fine granular structure; friable; medium acid; abrupt smooth boundary.

A2—7 to 10 inches; brown (10YR 5/3) silt loam; moderate fine granular structure; friable; strongly acid; clear smooth boundary.

B21t—10 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; dark grayish brown (10YR 4/2) clay films on ped faces; medium acid; clear smooth boundary.

B22t—20 to 28 inches; yellowish brown (10YR 5/4) light silty clay; many fine faint yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; dark grayish brown (10YR 4/2) clay films on ped faces; strongly acid; clear smooth boundary.

B23t—28 to 34 inches; yellowish brown (10YR 5/4) heavy silty clay loam; many medium distinct yellowish brown (10YR 5/8) mottles and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; discontinuous dark grayish brown (10YR 4/2) clay films on ped faces; slightly acid; clear smooth boundary.

B3—34 to 39 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; discontinuous dark grayish brown (10YR 4/2)

limit the use of some erosion-control practices. Contour farming and conservation tillage help to control erosion. Management group IIe-3.

531C2—Markham silt loam, 4 to 7 percent slopes, eroded. This is a moderately sloping soil in somewhat elongated areas on the sides of drainageways. It has a profile similar to the one described as representative of the series but has a thinner surface layer. In most areas material from the subsoil has been mixed with the surface layer.

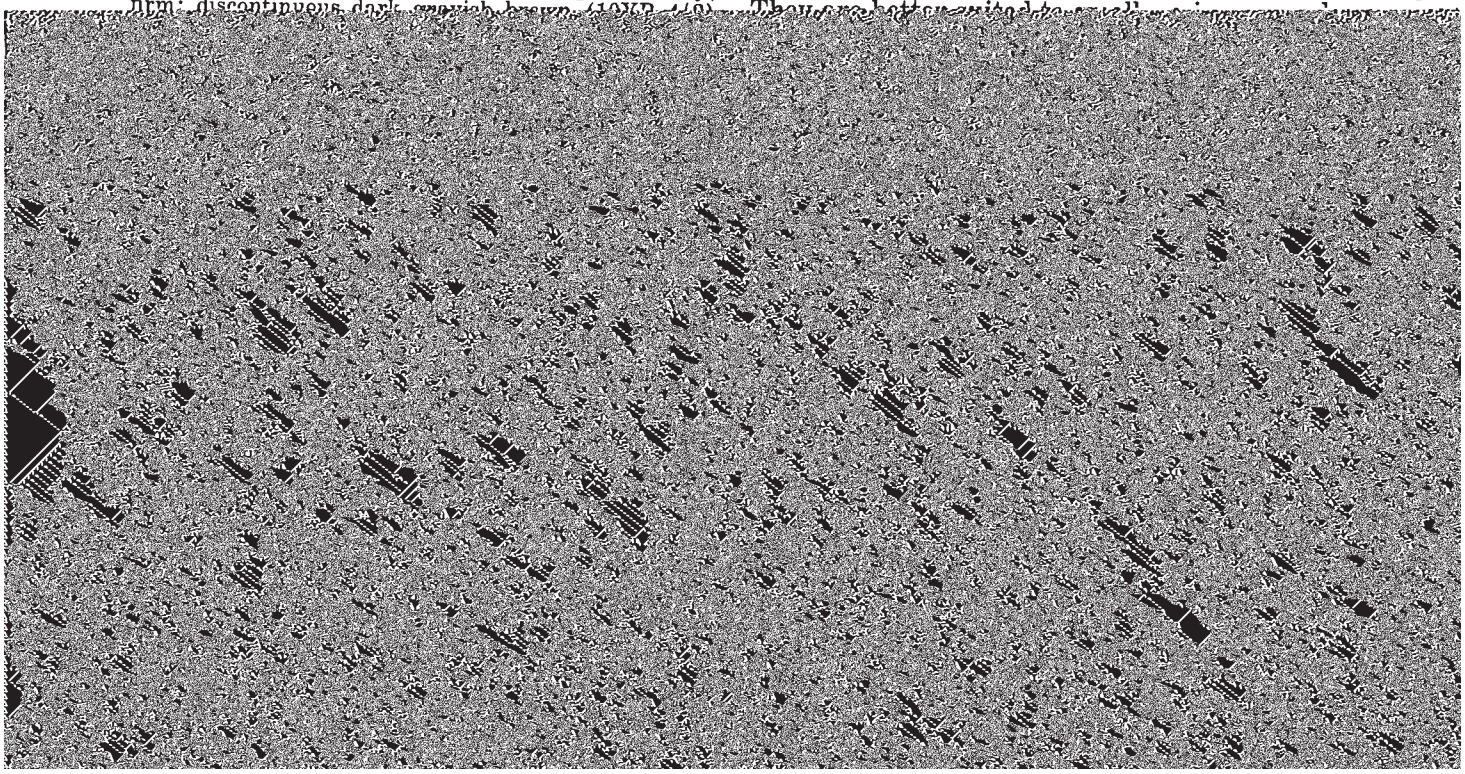
Included with this soil in mapping are small areas of Markham soils, 4 to 7 percent slopes, severely eroded, and small areas of Markham silt loam, 1 to 4 percent slopes. Also included are small areas of Morley silt loam, 4 to 10 percent slopes, and small areas where slopes are more than 7 percent.

This soil is suited to the crops commonly grown in the county, but it is subject to severe erosion if cropped. Contouring, terracing, or conservation tillage are needed to control erosion. Management group IIIe-1.

531C3—Markham soils, 4 to 7 percent slopes, severely eroded. This mapping unit is on the sides of large drainageways or at the head of watersheds in the moraine area. It has a profile similar to the one described as representative of the series, but the surface layer consists mostly, or entirely, of subsoil material and ranges from silt loam to silty clay. The organic-matter content is low.

Included with this unit in mapping are small areas where the surface layer includes only small amounts of subsoil material. Also included are small areas of Morley soils, 5 to 12 percent slopes, severely eroded, and areas that have steeper slopes.

These soils are suited to only limited row crops. They are better suited to well-managed pasture



Most areas of these soils are used intensively for corn and soybeans. Martinton soils are well suited to all commonly grown crops.

Representative profile of Martinton silt loam, 42 feet south and 1,970 feet east of the northwest corner of sec. 2, T. 31 N., R. 12 E.

Ap—0 to 10 inches; black (10YR 2/1) heavy silt loam; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A3—10 to 13 inches; very dark gray (10YR 3/1) light silty clay loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

B21t—13 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam; many fine distinct yellowish brown (10YR 5/4) mottles; moderate fine prismatic structure parting to moderate very fine subangular blocky; firm; very dark gray (10YR 3/1) coatings on ped faces; slightly acid; clear smooth boundary.

B22t—18 to 24 inches; grayish brown (10YR 5/2) light silty clay; many medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate very fine subangular blocky; firm; very dark gray (10YR 3/1) coatings on ped faces; neutral; clear smooth boundary.

B23t—24 to 31 inches; grayish brown (10YR 5/2) light silty clay; many medium distinct yellowish brown mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; dark grayish brown (10YR 4/2) coatings on ped faces; neutral; gradual smooth boundary.

B3—31 to 37 inches; grayish brown (10YR 5/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; mildly alkaline; gradual wavy boundary.

C1—37 to 45 inches; gray (5Y 5/1) stratified silty clay loam and loam; many coarse prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; firm; slightly effervescent; moderately alkaline; clear smooth boundary.

IIC2—45 to 60 inches; gray (5Y 5/1) silty clay loam; many coarse prominent yellowish brown (10YR 5/6 and 5/8) mottles; massive; firm; common till pebbles;

Maumee Series

The Maumee series consists of nearly level, poorly drained soils in large, low-lying to depressional areas on broad outwash plains. These soils formed in sandy glacial outwash material. The native vegetation was swamp grasses, reeds, and sedges.

In a representative profile the surface layer is black loamy fine sand about 18 inches thick. The subsoil is light brownish gray fine sand about 8 inches thick. The underlying material is gray fine sand.

Permeability is very rapid, and the available water capacity is low. The organic-matter content is high.

Maumee soils are farmed intensively, but management is needed to maintain the level of soil moisture and fertility necessary for sustained high production.

Representative profile of Maumee loamy fine sand, 55 feet north and 1,746 feet west of the southeast corner of sec. 18, T. 30 N., R. 10 W.

Ap—0 to 8 inches; black (10YR 2/1) loamy fine sand; weak medium granular structure; very friable; neutral; abrupt smooth boundary.

A12—8 to 18 inches; black (10YR 2/1) loamy fine sand; weak medium granular structure; very friable; medium acid; clear smooth boundary.

B2—18 to 26 inches; light brownish gray (2.5Y 6/2) fine sand; common medium prominent yellowish brown (10YR 5/4 and 5/6) mottles; single grained: loose; patchy dark gray (10YR 4/1) and very dark gray (10YR 3/1) stains; medium acid; clear wavy boundary.

C1—26 to 36 inches; gray (N 5/1) fine sand; common medium prominent yellowish brown (10YR 5/8) mottles; single grained; loose; neutral; gradual wavy boundary.

C2—36 to 60 inches; gray (N 5/0) and dark gray (2.5Y 4/0) fine sand; few medium prominent yellowish brown (10YR 5/8) mottles; single grained; loose; mildly alkaline.

The A horizon ranges from 10 to 20 inches in thickness. It is black and very dark gray loamy fine sand. The B

spring. Conservation tillage is needed to control soil blowing. Management group IIIw-1.

B2 horizon is silty clay loam and silty clay and has the heaviest textured material in the upper part. It is dark grayish brown to gray and has dominantly yellowish brown mottles. The B3 horizon

B1—15 to 22 inches; dark grayish brown (10YR 4/2) loam; few fine faint yellowish brown (10YR 5/4) mottles; weak very fine subangular blocky structure; friable; very dark gray (10YR 3/1) coatings on ped faces; clear smooth boundary.

B2t—22 to 28 inches; brown (10YR 5/3) light clay loam;

In a representative profile the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is about 35 inches thick. In sequence from the top it is 3 inches of brown heavy silt loam, 18 inches of yellowish brown silty clay loam, 7 inches of brown

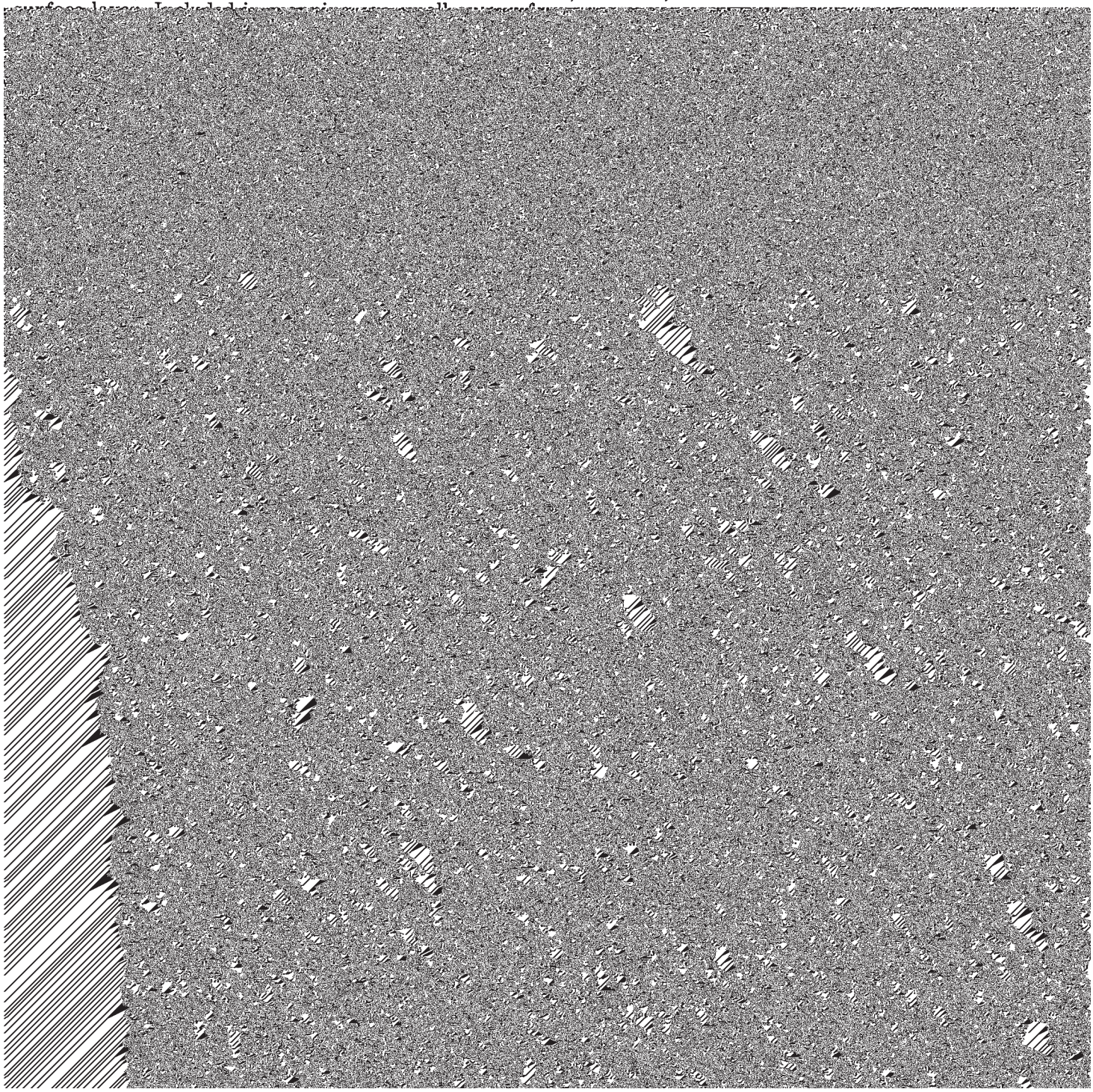
down the slope. The size and shape of the areas of soil limit the use of some erosion-control practices. Contour farming and conservation tillage help to control erosion. Management group IIe-3.

194C—Morley silt loam, 4 to 10 percent slopes. This soil is on short, irregularly shaped side slopes that are commonly adjacent to more rolling soils in woodland or pasture. It has a profile similar to the one described as representative of the series but has a thicker

pacity is low. The organic-matter content is low.

Morocco soils are not farmed intensively. Most areas are left idle or are in trees or water-tolerant grasses. Where they are farmed, these soils need special management to conserve water, increase fertility, and prevent soil blowing.

Representative profile of Morocco fine sand, 807 feet east and 87 feet north of the southwest corner of sec. 6, T. 29 N., R. 10 W.



wash material. The native vegetation was hardwood trees.

In a representative profile the surface layer is dark brown fine sand about 7 inches thick. The subsoil is yellowish brown fine sand about 33 inches thick. The underlying material is light yellowish brown and very pale brown fine sand.

Permeability is very rapid, and the available water capacity is low. The organic-matter content is low.

Oakville soils are better suited to trees than to other uses. If these soils are not protected by a plant cover, droughtiness and severe soil blowing are limitations to use.

Representative profile of Oakville fine sand, 1 to 6 percent slopes, 1,840 feet south and 40 feet east of the northwest corner of sec. 24, T. 30 N., R. 12 W.

A1—0 to 7 inches; dark brown (10YR 4/3 and 3/3) fine sand; very weak fine granular structure parting to single grained; loose; very strongly acid; clear smooth boundary.

B2—7 to 40 inches; yellowish brown (10YR 5/6) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

C—40 to 65 inches; light yellowish brown (10YR 6/4) and very pale brown (10YR 7/4) fine sand; single grained; loose; strongly acid.

The A horizon ranges from 5 to 9 inches in thickness. It is very dark grayish brown to dark brown. An A2 horizon occurs in places. The C horizon in places contains thin, darker colored bands or lamellae.

741B—Oakville fine sand, 1 to 6 percent slopes. This is a nearly level to moderately sloping soil on broad ridges that are higher than the surrounding, more poorly drained soils. It has the profile described as representative of the series. In many areas that have been cropped, the surface layer is lighter colored. In

or east-facing. Included in mapping are small areas of Oakville fine sand, 7 to 18 percent slopes, or Oakville fine sand, 1 to 6 percent slopes.

This soil is best suited to trees because it has steep slopes. Management group VIIs-1.

Onarga Series

The Onarga series consists of nearly level to gently sloping, moderately well drained to well drained soils in higher and better drained positions on the landscape. These soils occur in widely scattered areas throughout the county. They formed in loamy glacial outwash material. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark gray and very dark grayish brown fine sandy loam about 12 inches thick. The subsoil is dark yellowish brown and dark brown fine sandy loam and sandy clay loam about 17 inches thick. The underlying material is stratified fine sand and loamy fine sand.

Permeability and the available water capacity are moderate. The organic-matter content is moderate.

Onarga soils are used intensively for corn and soybeans. Good management and conservation tillage are needed to conserve moisture and lessen the danger of soil blowing or water erosion.

Representative profile of Onarga fine sandy loam, 2 to 4 percent slopes, 54 feet east and 2,300 feet south of the center of sec. 27, T. 31 N., R. 12 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sandy loam; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A12—9 to 12 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium granular struc-

150A—Onarga fine sandy loam, 0 to 2 percent slopes. This is a nearly level soil in areas that are somewhat higher and better drained than the surrounding areas. This soil has a profile similar to the one described as representative of the series, but in most places it has a thicker and darker colored surface layer and has more mottling in the lower part of the subsoil.

Included with this soil in mapping are small areas of Hoopeston fine sandy loam and Ade loamy fine sand, 1 to 5 percent slopes. Also included are small areas where moderately fine textured glacial drift is 4 or 5 feet below the surface.

This soil is suited to all the crops commonly grown in the county. Increasing organic-matter content and controlling soil blowing are the main concerns of management. Conservation tillage is needed to overcome the limitations for crops. Management group IIs-1.

150B—Onarga fine sandy loam, 2 to 4 percent slopes. This soil is on small mounds or short side slopes in areas of flat topography. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Onarga fine sandy loam, 0 to 2 percent slopes, and areas of Ade loamy fine sand, 1 to 5 percent slopes. Also included are areas where the surface layer is thinner or lighter colored than is described as representative of the series and small areas where moderately fine textured glacial drift is 4 or 5 feet below the surface.

This soil is suited to the crops commonly grown in the county. If farmed intensively, it is subject to water erosion or soil blowing. Droughtiness is a problem during mid-summer months. Conservation tillage is needed to conserve moisture and to protect this soil from erosion. Management group IIs-1.

Palms Series

The Palms series consists of very poorly drained, nearly level to depressional organic soils in low-lying areas or depressions. These soils formed in swampy areas in 20 to 51 inches of fibrous plant remains over

Oa2—9 to 26 inches; black (N 2/0) broken faced and rubbed sapric material; about 20 percent mineral material; about 15 percent fiber, less than 5 percent when rubbed; weak medium subangular blocky structure; friable; neutral; clear smooth boundary.

Oa3—26 to 37 inches; very dark brown (10YR 2/2) broken faced and rubbed sapric material; about 20 percent mineral; about 20 percent fiber, less than 5 percent when rubbed; weak medium and coarse subangular blocky structure; friable; mildly alkaline; abrupt smooth boundary.

IIC—37 to 60 inches; gray (5Y 5/1) and pale brown (10YR 6/3) sandy loam that has limestone rubble in the lower part; single grained; loose; strongly effervescent; moderately alkaline.

The sapric material is 20 to 51 inches thick. The mineral content ranges from 10 to more than 50 percent. Hemic or undecomposed organic layers make up only a small part of the profile. Snail shells are common.

Palms soils are similar to Lena soils but are not so calcareous and have an organic layer that is less than 51 inches thick. Palms soils have a lower concentration of snail shells than Lena soils.

100—Palms muck. This is a nearly level soil in depressions on flat sandy glacial outwash plains. Slope is 0 to 2 percent.

Included with this soil in mapping are small areas of recent overwash, small areas where the organic layer is more than 51 inches thick, and small areas where a concentration of marl is 12 to 20 inches below the surface. Calcareous areas are shown on the soil map by conventional symbols.

This soil has limited suitability for crops. It is difficult to drain because outlets are generally inadequate. Management group IIIw-2.

Peotone Series

The Peotone series consists of very poorly drained, nearly level soils in depressions in morainal areas. These soils formed in clayey and silty water-deposited material and the underlying glacial drift. The native vegetation was reeds, sedges, and swamp grasses.

In a representative profile the surface layer is black silty clay loam about 17 inches thick. The subsoil is silty clay loam about 37 inches thick. It is black in the

loam; few fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; neutral; clear smooth boundary.

B22g—26 to 34 inches; dark gray (N 4/0) silty clay loam; many medium distinct light olive brown (2.5Y 5/4 and 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; neutral; clear smooth boundary.

B23g—34 to 44 inches; gray (5Y 6/1) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; mildly alkaline; gradual wavy boundary.

[illegible]

brown loam; in the middle 12 inches it is dark brown sandy clay loam and clay loam; and in the lower 5 inches it is dark yellowish brown clay loam that has many pebbles and broken pieces of limestone. Slightly weathered limestone bedrock is at a depth of 44 inches.

Permeability is moderate above the limestone. The available water capacity is high. The organic-matter content is high. Increasing the organic-matter content and protecting gently sloping areas from erosion are the main concerns of management.

Representative profile of Plattville silt loam, 0 to 2 percent slopes, 1,960 feet north and 1,910 feet west of

This soil is suited to the crops commonly grown in the county. If good management is used, crops can be grown intensively. Management group I-1.

[illegible]

(10YR 4/1) coatings on ped faces; mildly alkaline; abrupt smooth boundary (1 inch horizon of yellowish brown (10YR 5/8) loam at base).

IIB3g—32 to 47 inches; light gray (5Y 6/1 and 7/1) silty [illegible]

Representative profile of Ritchey silt loam, 2 to 6 percent slopes, 70 feet north and 1,990 feet west of the southeast corner of sec. 32, T. 32 N., R. 11 E.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam that has a very high sand content; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A2—3 to 6 inches; brown (10YR 5/3) silt loam that has a very high sand content; weak medium platy structure parting to moderate medium granular; friable; medium acid; clear smooth boundary.

B21t—6 to 13 inches; dark yellowish brown (10YR 4/4) light silty clay loam that has a high sand content; moderate medium subangular blocky structure; firm; slightly acid; clear smooth boundary.

B22t—13 to 16 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; firm; mildly alkaline; abrupt smooth boundary.

IIR—16 inches; limestone bedrock; level bedded; slightly weathered.

The A horizon ranges from 4 to 9 inches in thickness. It is silt loam or loam. The light colored A2 horizon is commonly disturbed by plowing. The B horizon ranges from 6 to 14 inches in thickness. In most places it is clay loam or silty clay loam that has a high sand content. The lower part of the B horizon is sandier or cobbly, and only in small areas did it form in residuum weathered from the limestone.

Ritchey soils are on the same landscape as Whalan, Channahon, and Faxon soils. Ritchey soils are more shallow to limestone than Whalan and Faxon soils. They have a thinner A1 horizon than Channahon soils.

311B—Ritchey silt loam, 2 to 6 percent slopes. This is a gently sloping to moderately sloping soil in somewhat elongated areas in the Kankakee River Valley. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Whalan loam, 2 to 4 percent slopes, and Channahon silt loam, 2 to 4 percent slopes. Also included are more nearly level soils and soils that are more shallow to bedrock than is described as representative of the series. Eroded areas and small bedrock escarpments are shown on the soil map by conventional symbols.

This soil is suited to small grain or meadow crops. Areas in trees or pasture should remain in these uses. This soil has very limited potential for use because it is very shallow to bedrock and is subject to erosion. Management group IIIs-3.

311D—Ritchey silt loam, 10 to 15 percent slopes. This is a strongly sloping to moderately steep soil on the short side slopes or breaks of the drainageways along the Kankakee River.

Included with this soil in mapping are small areas of Ritchey silt loam, 2 to 6 percent slopes, and areas where the surface layer is mostly subsoil material. Also included are areas where the limestone bedrock is shallower than typical. Bedrock escarpments that are common along the shore of the river are shown on the soil map by conventional symbols.

This soil is better suited to trees or pasture than to other uses. Erosion is a very serious limitation to any use. Management group VIe-1.

Rockton Series

The Rockton series consists of nearly level to gently sloping, moderately deep, well drained soils along the Kankakee River Valley. These soils formed in moderately deep deposits of loamy glacial outwash material that is 20 to 40 inches deep over limestone bedrock (fig. 6). The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark brown and very dark grayish brown loam about 13 inches thick. The subsoil is clay loam about 17 inches thick. The upper part of the subsoil is dark yellowish brown, and the lower part is light olive brown that has yellowish brown mottles. Slightly weathered limestone bedrock is at a depth of 30 inches.

Permeability is moderate above the limestone. The available water capacity is low to moderate. The organic-matter content is moderate.

Rockton soils have only limited suitability for corn and soybeans because they have a shallow root zone. Controlling erosion and increasing the organic-matter content are the main concerns of management.

Representative profile of Rockton loam, 0 to 2 percent slopes, 2,080 feet north and 85 feet west of the southeast corner of sec. 7, T. 30 N., R. 11 E.

Ap—0 to 9 inches; very dark brown (10YR 2/2) loam; moderate fine granular structure; friable; mildly alkaline; clear smooth boundary.

A12—9 to 13 inches; very dark grayish brown (10YR

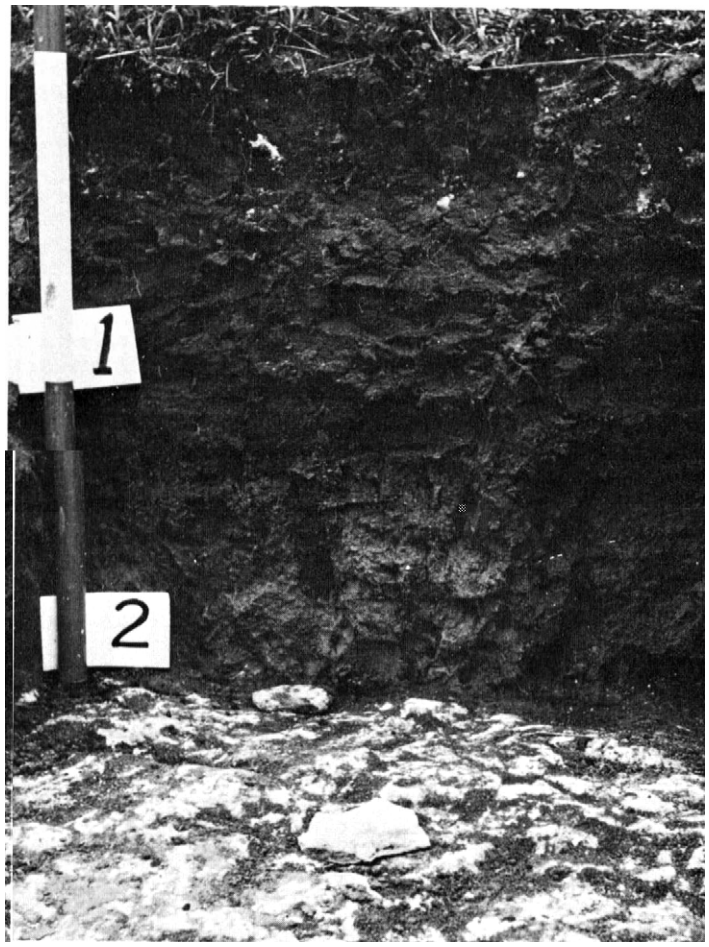


Figure 6.—A profile of Rockton loam. Limestone bedrock is at a depth of 24 inches.

3/2) loam; moderate fine and medium granular structure; friable; mildly alkaline; clear smooth boundary.

B21t—13 to 19 inches; dark yellowish brown (10YR 3/4) clay loam; moderate fine subangular blocky structure; friable; continuous very dark brown (10YR 2/2) coatings on ped faces; neutral; clear smooth boundary.

B22t—19 to 25 inches; dark yellowish brown (10YR 4/4) clay loam; common fine faint yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; continuous dark grayish brown (10YR 4/2) coatings on ped faces; neutral; clear smooth boundary.

B23t—25 to 30 inches; light olive brown (2.5Y 5/4) clay loam; common medium faint yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; firm; neutral; abrupt smooth boundary (lower 1 or 2 inches is stones and loamy matrix; strongly effervescent; moderately alkaline).

Sawmill Series

The Sawmill series consists of poorly drained, nearly level soils on bottom lands. These soils formed in water-laid silty clay loam sediment.

In a representative profile the surface layer is black silty clay loam about 35 inches thick. The subsoil is about 25 inches thick. In the upper 18 inches it is gray silty clay loam, and in the lower 7 inches it is gray clay loam. Yellowish brown mottles are throughout the subsoil.

Permeability is moderate to moderately slow, and the available water capacity is very high. The organic-matter content is high.

Where cultivation is practical, Sawmill soils are

Selma Series

The Selma series consists of nearly level, poorly drained soils on broad glacial outwash plains, mainly north and east of the Kankakee River. These soils formed in medium textured and moderately coarse textured glacial outwash material. The native vegetation was prairie grasses adapted to swampy conditions.

In a representative profile the surface layer is black and very dark gray heavy loam about 14 inches thick. The subsoil is about 28 inches thick. In the upper 5 inches it is dark grayish brown light clay loam; in the middle 19 inches it is clay loam that has large yellowish brown mottles; and in the lower 4 inches it is gray sandy loam. The underlying material is light gray and light brownish gray sand. It is neutral glacial outwash material.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high.

Most areas of these soils are used intensively for corn and soybeans. Selma soils are well suited to these and other commonly grown crops.

Representative profile of Selma loam, 62 feet west and 2,010 feet south of the northeast corner of sec. 2, T. 31 N., R. 14 E.

Ap—0 to 9 inches; black (10YR 2/1) heavy loam; moderate fine and medium granular structure; friable; neutral; abrupt smooth boundary.

A12—9 to 14 inches; very dark gray (10YR 3/1) heavy loam; moderate fine and medium granular structure; friable; neutral; clear smooth boundary.

125—Selma loam. This is a nearly level soil on broad glacial outwash plains. Slope is 0 to 2 percent.

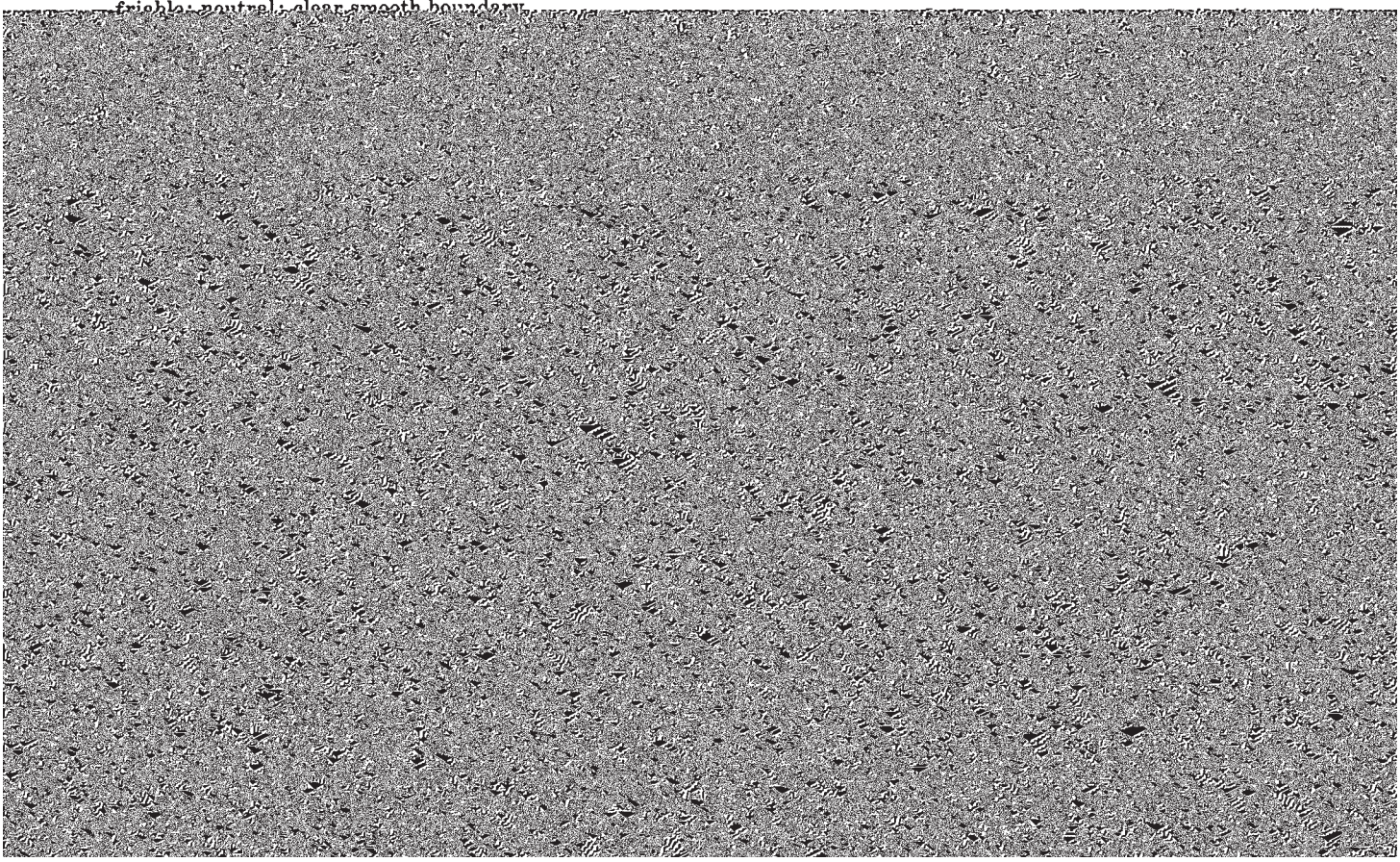
Included with this soil in mapping are small areas of Darroch silt loam and Gilford fine sandy loam. Wet areas, calcareous areas, and gray spots are shown on the soil map by conventional symbols.

If drained, this soil is well suited to most crops commonly grown in the county. A seasonal high water table in all areas and the risk of ponding in the lower lying areas can be serious limitations to use. Runoff is slow. Tile drains and shallow surface ditches are needed to improve drainage, especially for cultivation early in spring. Management group IIw-1.

R125—Selma loam, bedrock substratum. This is a nearly level soil on broad glacial outwash plains. It has a profile similar to the one described as representative of the series, but has limestone bedrock at a depth of 40 to 60 inches.

Included with this soil in mapping are small areas of Plattville silt loam, 0 to 2 percent slopes; Rockton loam, 0 to 2 percent slopes; and Faxon clay loam. Wet areas and calcareous areas are shown on the soil map by conventional symbols.

A seasonal high water table in all areas and the risk of ponding in the lower lying areas can be serious limitations in the use of this soil. Runoff is slow. Tile drains and shallow surface ditches are needed to improve drainage, especially for cultivation early in spring. Management group IIw-1.



B22—20 to 36 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; strongly acid; clear smooth boundary.

C—36 to 62 inches; brownish yellow (10YR 6/6) and light yellowish brown (10YR 6/4) fine sand; many coarse distinct strong brown (7.5YR 5/6) mottles; single grained; loose; strongly acid.

The A horizon ranges from 10 to 18 inches in thickness. It ranges from black to very dark grayish brown loamy fine sand or fine sand. The B horizon is brown to brownish yellow loamy fine sand or fine sand. The C horizon is fine and medium sand that has variable colors. In most places the heavier textured lamellae are below a depth of 5 feet.

Sparta soils are associated with Watseka, Maumee, and Oakville soils. Sparta soils are better drained than Watseka and Maumee soils. They have a thicker and darker colored A horizon than Oakville soils.

88B—Sparta loamy fine sand, 1 to 5 percent slopes. This is a nearly level to moderately sloping soil in areas that are somewhat higher than the surrounding areas.

Included with this soil in mapping are areas where the surface layer is thinner than is described as representative of the series. Also included are small areas of Watseka loamy fine sand and Ade loamy fine sand.

The low available water capacity and natural fertility and the hazard of soil blowing are serious limitations to the use of this soil. If this soil is used for crops, conservation tillage and other good management practices are needed. Management group IVs-1.

Symerton Series

black (10YR 2/1) coatings on ped faces; slightly acid; clear smooth boundary.

B21t—13 to 17 inches; dark brown (10YR 4/3) silty clay loam that has a high sand content; moderate very fine subangular blocky structure; firm; very dark gray (10YR 3/1) discontinuous coatings on ped faces; medium acid; clear smooth boundary.

B22t—17 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam that has a high sand content; weak fine prismatic structure parting to moderate very fine subangular blocky; firm; very dark gray (10YR 3/1) coatings on ped faces; slightly acid; clear smooth boundary.

B23t—26 to 34 inches; yellowish brown (10YR 5/6) clay loam; many coarse distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; firm; neutral; abrupt smooth boundary.

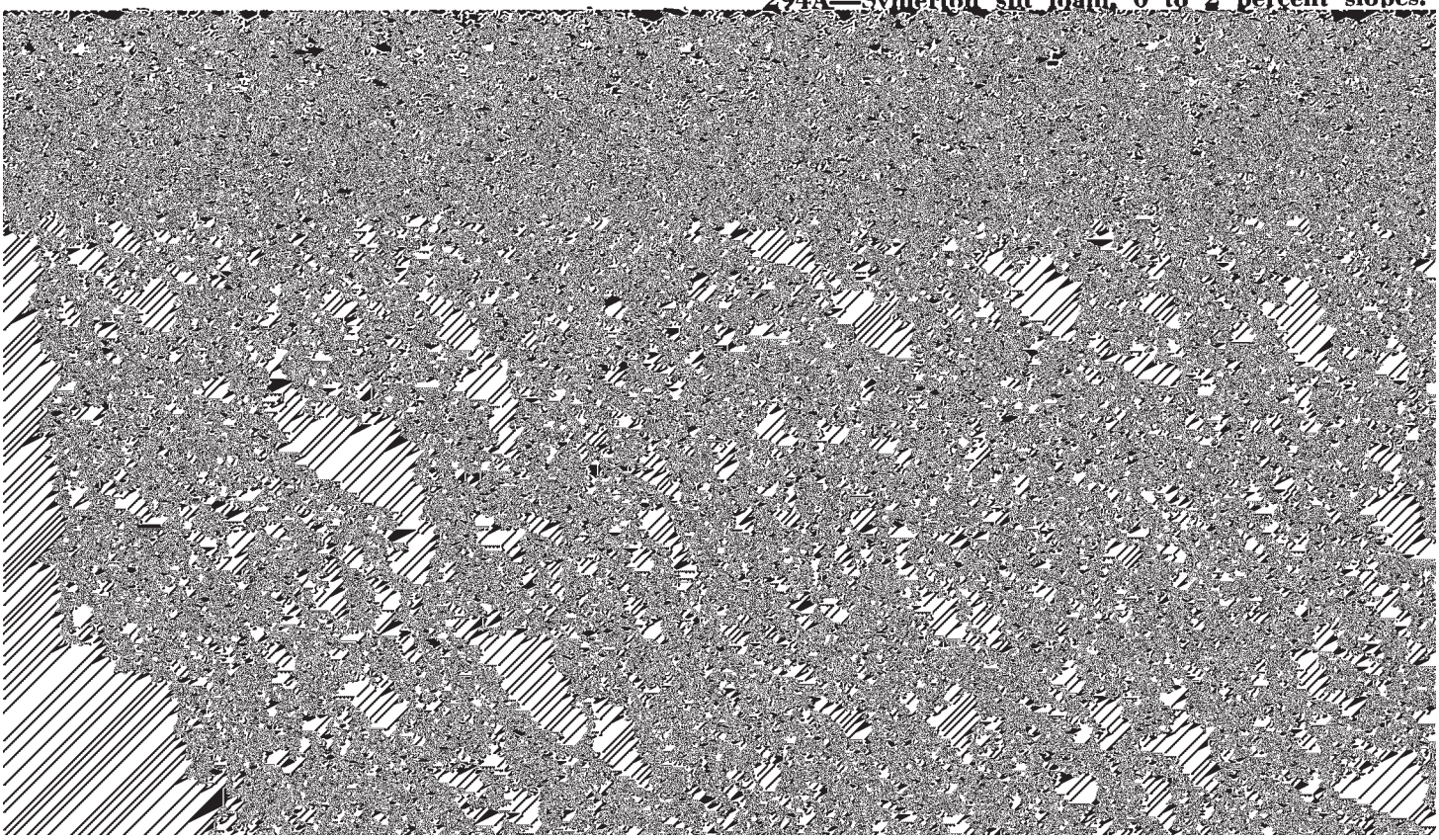
IIB3—34 to 44 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; firm; slightly effervescent; mildly alkaline; gradual wavy boundary.

IIC—44 to 60 inches; brown (10YR 5/3) silty clay loam; many fine faint grayish brown (10YR 5/2) mottles; massive; firm; strongly effervescent; moderately alkaline.

The A horizon ranges from 10 to 15 inches in thickness. It is black to very dark grayish brown silt loam and loam. The B horizon is mainly silty clay loam but is clay loam in places. The lower part of the B horizon is commonly stratified with loam or sandy loam. The IIB3 horizon formed in glacial till. It is silty clay loam and has colors similar to the underlying till. The C horizon is silty clay loam that is compact and calcareous.

Symerton soils are associated with Andres and Reddick soils. Symerton soils are better drained than those soils.

294A—Symerton silt loam, 0 to 2 percent slopes.



soils on large mounds or side slopes on moraines. These soils formed in silty clay loam glacial till. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark gray and very dark grayish brown silt loam about 12 inches thick. The subsoil is about 36 inches thick. In the upper 18 inches it is brown, dark yellowish brown, and light olive brown silty clay loam and light silty clay that has yellowish brown mottles, and in the lower 18 inches it is grayish brown and gray silty clay loam. The underlying material is gray, calcareous, silty clay loam glacial till that has yellowish brown mottles.

Permeability is moderately slow, and the available water capacity is moderate. The organic-matter content is high.

Most of the gently sloping Varna soils are suited to cultivated crops, but the severely eroded Varna soil in moderately sloping areas is only suited to limited cropping. Controlling erosion and increasing the organic-matter content are the main concerns of management.

Representative profile of Varna silt loam, 1 to 4 percent slopes, 35 feet north and 770 feet east of the southwest corner of sec. 6, T. 29 N., R. 11 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A3—8 to 12 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

B21t—12 to 18 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; firm; and Ashkum soils. They have a darker colored and thicker A horizon than Markham soils.

223B—Varna silt loam, 1 to 4 percent slopes. This soil occupies the higher areas or is on short side slopes surrounded by more poorly drained and more nearly level soils. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Elliott silt loam, 0 to 2 percent slopes. Also included are small areas of Symerton silt loam, 2 to 4 percent slopes.

This soil is well suited to the crops commonly grown in the county. Erosion is a hazard if tillage is up and down the slope. The size and shape of the areas of soil limit the use of some erosion-control practices. Contour farming and conservation tillage help to control erosion. Management group IIe-3.

223C3—Varna soils, 4 to 7 percent slopes, severely eroded. This mapping unit is on isolated mounds or on sides of drainageways in moraine areas. It has a surface layer that consists mostly, or entirely of subsoil material and is silty clay loam or silt loam. The organic-matter content is low.

Included with this unit in mapping are small areas where the surface layer contains only small amounts of subsoil material. Also included are small areas where slopes are more than 7 percent.

These soils are suited to only limited row crops. They are better suited to small grain or meadow crops. Erosion has been and will continue to be severe if these soils are farmed without the use of erosion-

fine sand; common medium distinct yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; loose; discontinuous dark gray (10YR 4/1) coatings on ped faces; slightly acid; gradual irregular boundary.

B2—24 to 32 inches; light brownish gray (10YR 6/2) fine sand; weak coarse subangular blocky structure and single grained; loose; large dark gray (10YR 4/1) and very dark gray (10YR 3/1) stains; medium acid; clear wavy boundary.

C—32 to 60 inches; light gray (10YR 7/2) fine sand; single grained; loose; medium acid.

The A horizon ranges from 10 to 15 inches in thickness. It is black and very dark gray loamy fine sand. The B

cent slopes, 1,325 feet east and 950 feet north of the center of sec. 9, T. 31 N., R. 11 E.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) loam; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

A2—5 to 11 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak platy structure; friable; very dark grayish brown (10YR 3/2) stains; strongly acid; clear smooth boundary.

B1—11 to 14 inches; yellowish brown (10YR 5/4) light loam; moderate very fine subangular blocky structure; friable; dark grayish brown (10YR 4/2) stains; medium acid; clear smooth boundary.

B21t—14 to 21 inches: dark yellowish brown (10YR 4/4)

other crops is limited because it has low available water capacity and is subject to severe erosion if tilled up and down the slope. Areas in woodland or pasture should remain in these uses. Management group IIe-1.

Use and Management of the Soils

The soil survey is a detailed analysis and evaluation of the most basic resource of the survey area—the soil. It may be used to fit the use of the land, including urbanization, to the limitations and potentials of the natural resources and the environment and to help avoid soil-related failures in uses of the land.

During a soil survey soil scientists, conservationists, engineers, and others keep extensive notes, not only about the nature of the soils but also about unique aspects of behavior of these soils in the field and at construction sites. These notes include observations of erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic systems, and other factors relating the kinds of soil and their productivity, potentials, and limitations under various uses and management. In this way field experience incorporated with measured data on soil properties and performance is used as a basis for predicting soil behavior.

Information in this section will be useful in applying basic facts about the soils to plans and decisions for use and management of soils for crops and pasture, woodland, and many nonfarm uses, including building

Crops and Pasture

About 71 percent of Kankakee County is cultivated. Corn and soybeans are the principal crops. Wheat, oats, grass-legume hay, truck crops, gladioli, sodgrass, and nursery crops are also important.

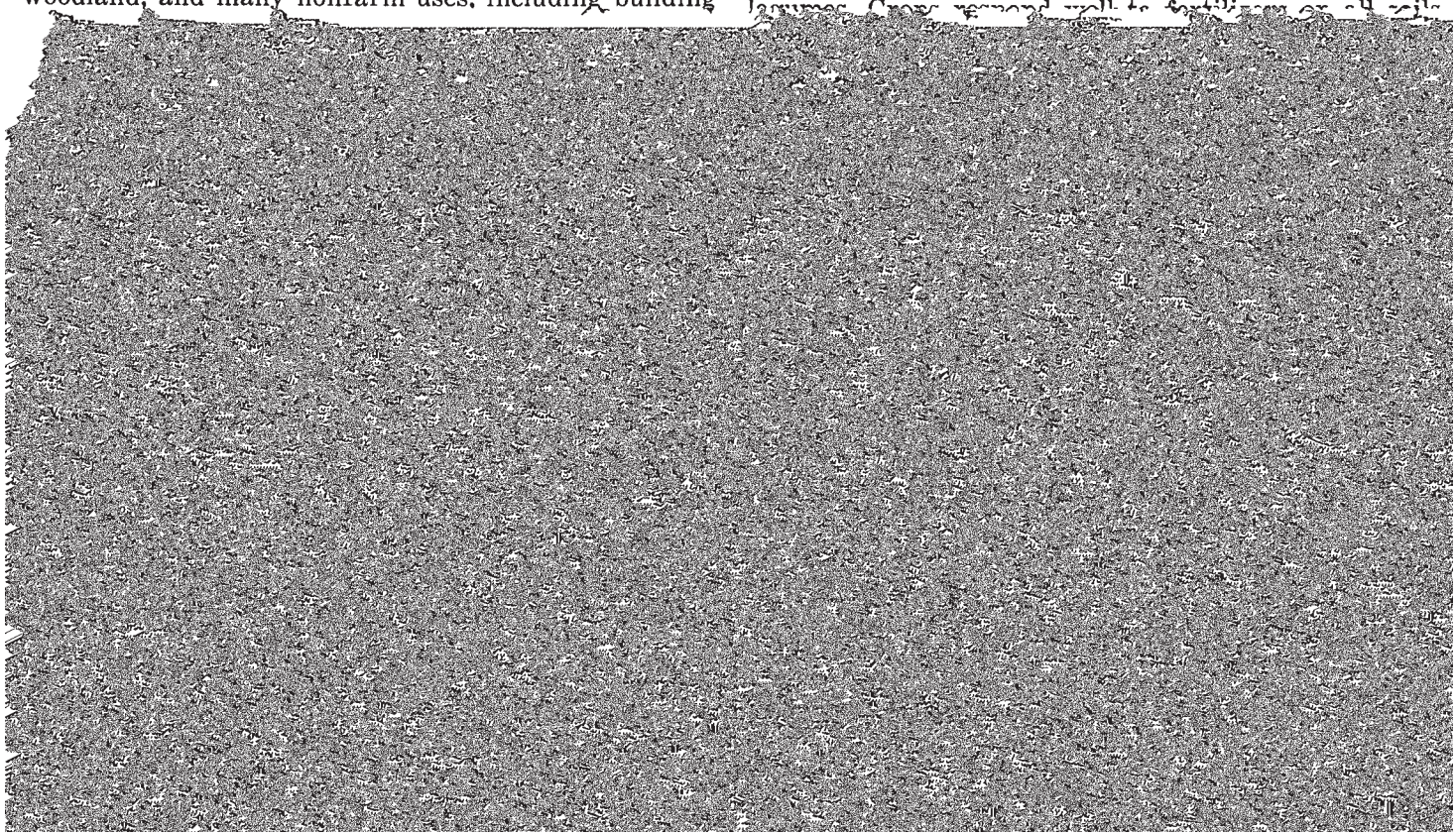
The main concerns in managing cultivated soils in the county are controlling soil blowing and erosion, overcoming wetness, and protecting the soils from ponding or flooding. Conserving moisture and maintaining tilth and fertility are other management concerns that are important in sustaining high production.

Measures that help to control soil blowing and erosion include contour farming; conservation tillage; and use of cover crops, windbreaks, grassed waterways, and, where practical, terraces. Generally a combination of several measures is most satisfactory.

Measures that help to overcome wetness include the use of tile drains, shallow surface ditches, surface inlets to tile drains, drainage ditches, and diversions. Using levees or, where practical, decreasing runoff from the watershed helps to control flooding.

Conserving moisture generally means reducing evaporation, limiting runoff, increasing infiltration, controlling the water table, and controlling weeds. Practices that help to conserve moisture include conservation tillage, use of crop residue, contour farming, and use of buffer strips and field windbreaks.

Among the measures that help to maintain tilth and fertility are the application of chemical fertilizer, green manure, and barnyard manure and the inclusion in the cropping system of cover crops, grasses, and



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, defined as follows:

ient grouping for making many statements about management of soils. Management groups are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIw-1 or IIIe-1. Thus, in one symbol, the Roman numeral designates the capability class or degree of limitation; the small letter

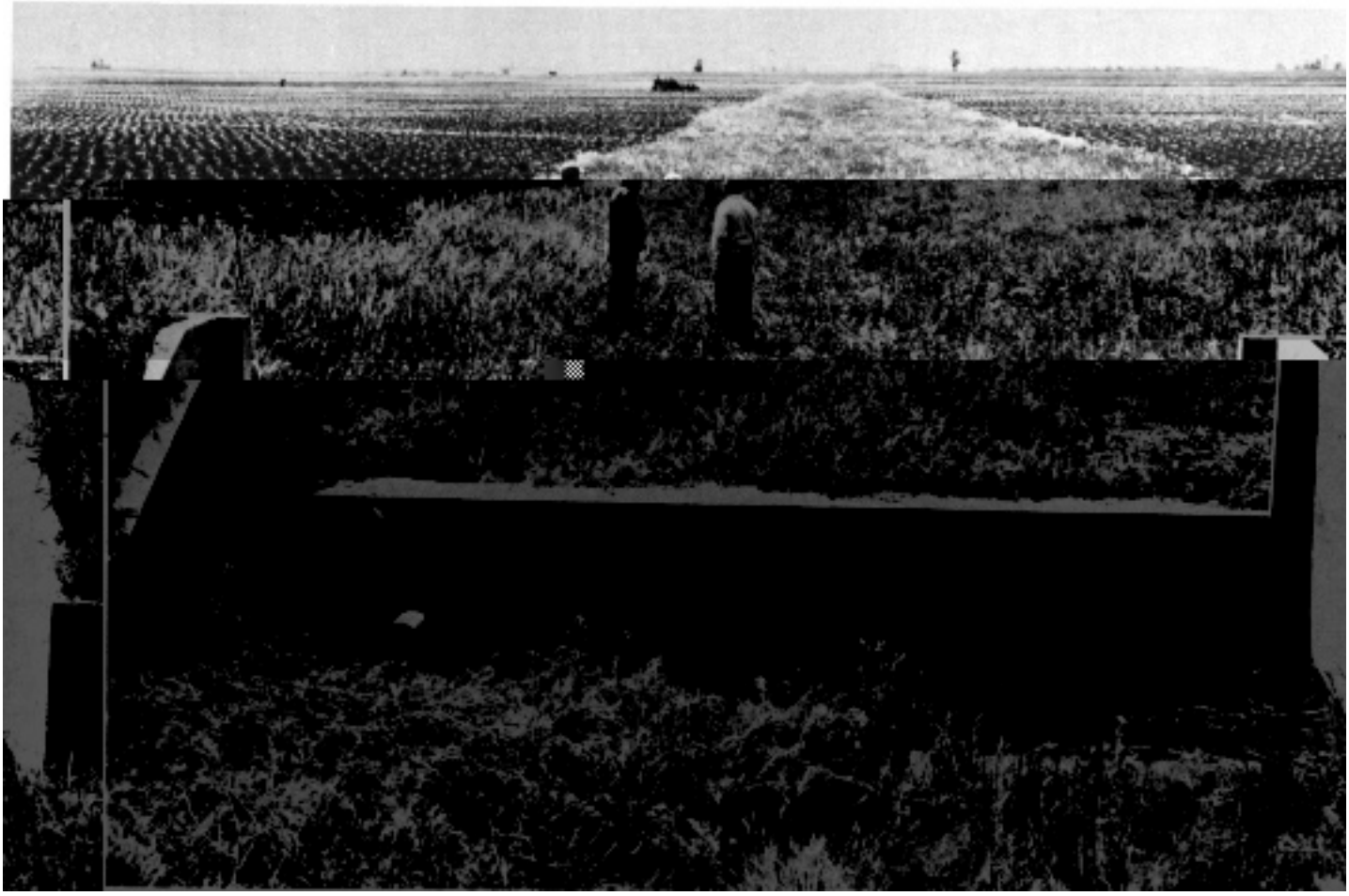


Figure 7.—**A newly established grassed waterway and grade control structure in an area of Symerton silt loam, 2 to 4 percent slopes.**

MANAGEMENT GROUP IIe-2

This group consists of deep, gently sloping, somewhat poorly drained soils that formed in glacial till on uplands. The surface layer is silt loam. The subsoil is silty clay or heavy silty clay loam.

Permeability is moderately slow and slow, and the available water capacity is moderate. The organic-matter content is high and moderate.

The main concerns of management are controlling erosion and maintaining good tilth and organic-matter content. Where mechanical erosion control practices are not practical, a conservation cropping system and conservation tillage are needed. Returning all crop residues to the soil helps to maintain the organic-matter content and provide good tilth. Grassed waterways help to remove excess water and retard erosion.

These soils are well suited to corn, soybeans, and the other commonly grown crops. If well managed, they can be used intensively for cultivated crops.

MANAGEMENT GROUP IIe-3

This group consists of deep, gently sloping, moderately well drained and well drained soils that formed in glacial till on uplands. The surface layer is silt loam. The subsoil is heavy silty clay loam or silty clay.

Permeability is moderately slow, and the available water capacity is moderate. The organic-matter content of the surface layer is moderate to high.

The main concern of management is controlling erosion. Maintaining good tilth and increasing the organic-matter content are also important. Where contour farming is not practical, a cropping system that provides maximum soil protection and conservation tillage are needed. All crop residues should be returned to the soil. Grassed waterways help to remove excess water and retard erosion.

These soils are well suited to corn, soybeans, and the other commonly grown crops. If well managed, they can be used intensively for cultivated crops.

MANAGEMENT GROUP IIw-1

This group consists of nearly level, poorly drained soils that formed in glacial outwash and alluvial sediment. The surface layer is loam, clay loam, and silty clay loam. The subsoil is clay loam, silt loam, and silty clay loam.

Permeability is moderate, and the available water capacity is high or very high. The organic-matter content is high. These soils have a high water table, and most are subject to occasional flooding from stream overflow. Runoff is slow.

Wetness is the main limitation to the use of these soils. Providing adequate drainage and protection from flooding are the main concerns of management. Tile drains, surface drains, and dikes can be used individually or in combination to provide adequate drainage.

If these soils are protected from flooding and adequately drained, they are well suited to row crops and small grains. Hay and pasture crops are better adapted than other crops if flooding and wetness are controlled.

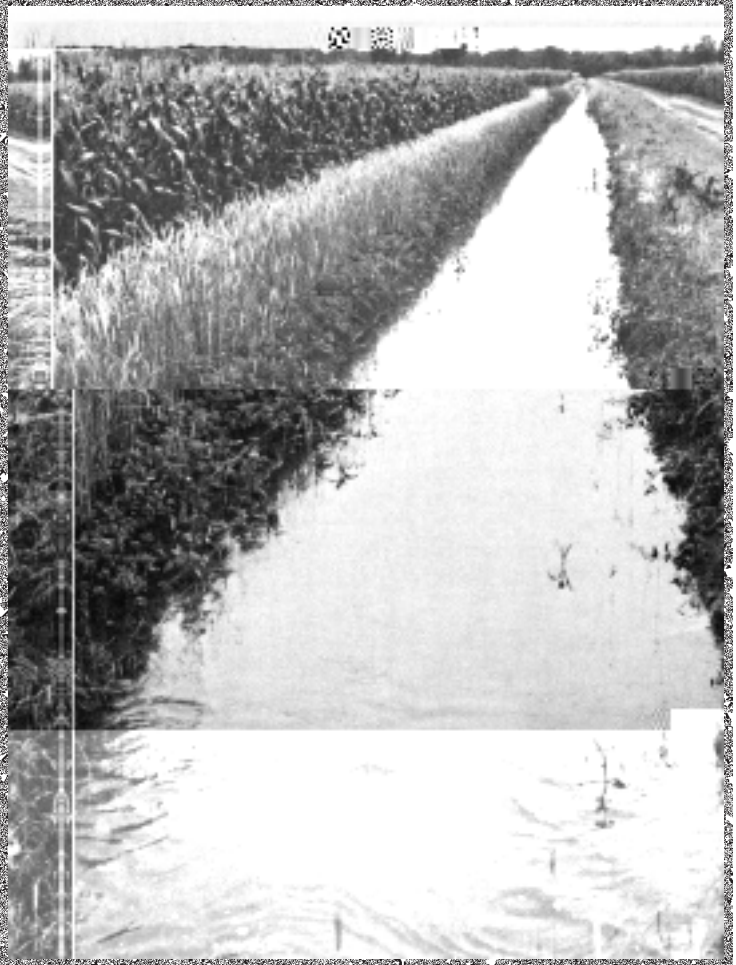
in glacial lake-laid sediment and glacial till. The surface layer is silty clay or silt loam. The subsoil is silty clay and silty clay loam. Permeability is slow, and the available water capacity is moderate.

Providing adequate drainage and maintaining good tilth are the main concerns of management. Tile drainage alone is not effective because these soils have slow permeability. Tile drains are most effective when used with surface inlets where water tends to pond. In most areas a combination of shallow surface drains and

soil blowing and increasing the organic-matter content are the main concerns of management. Some additional artificial drainage is needed in many areas. Shallow surface drains used with random tile lines are most effective. Frequent moderate applications of fertilizer

Permeability is moderately rapid to very rapid, and the available water capacity is low. These soils have a high water table.

Controlling the high water table and providing adequate drainage are the main concerns of management.



fertilization and controlling the ground water level during the growing season.

If drained, these soils are well suited to corn and soybeans. They are seldom used for small grain and meadow crops. Some areas that are too wet for row crops are used for pasture or are left idle and provide an excellent habitat for wildlife.

MANAGEMENT GROUP IIIw-3

This group consists of nearly level, poorly drained soils that formed in loamy glacial outwash material. The surface layer and subsoil are loam or clay loam.

Permeability is moderate, and the available water capacity is moderate to high. The organic-matter content is high.

These soils are better suited to small grain, pasture, and meadow crops than to other uses. If the soils are used for pasture, adapted varieties of legumes and grasses should be favored when pastures are reseeded. Existing stands of trees should not be cleared.

MANAGEMENT GROUP IVe-1

This group consists of moderately well drained, moderately sloping, severely eroded soils that formed in silty clay loam glacial till. The surface layer consists mainly of material from the upper part of the subsoil and is silty clay loam. The subsoil is silty clay to silty clay loam. The underlying material is calcareous silty clay loam glacial till.

Permeability is moderately slow, and the available

ment. Droughtiness is a concern on the shallow Ritchey soils. Reestablishing permanent vegetation in areas that were once cropped is difficult because of the hazard of erosion, rapid runoff, and steep slopes. Established hay and pasture crops need to be maintained by good management. Woodland areas need to be protected from fire and grazing. These soils are better suited to pasture, hay, and trees than to other uses.

TABLE 4.—*Yields per acre of crops and pasture*

[All yields were estimated for a high level of management in 1975. Absence of a yield figure indicates the crop is seldom grown or is not suited. Only arable soils are listed]

Soil name and map symbol	Corn	Soy-beans	Wheat, winter	Oats	Grass-legume hay	Brome-grass-alfalfa

TABLE 4.—*Yields per acre of crops and pasture* —Continued

Soil name and map symbol	Corn	Soybeans	Wheat, winter	Oats	Grass-legume hay	Brome-grass-alfalfa
	Bu	*Bu*	*Bu*	*Bu*	*Ton*	*AUM*[1]
Beecher:						
298A	101	35	44	65	4.1	6.6
298B	96	32	40	60	4.0	6.5
Ritchey:						
311B	55	23	32	45	2.6	4.1

soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

Crops other than those shown in table 4 are grown in the survey area, but because their acreage is small, predicted yields for these crops are not included. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the productivity and management concerns of the soils for these crops.

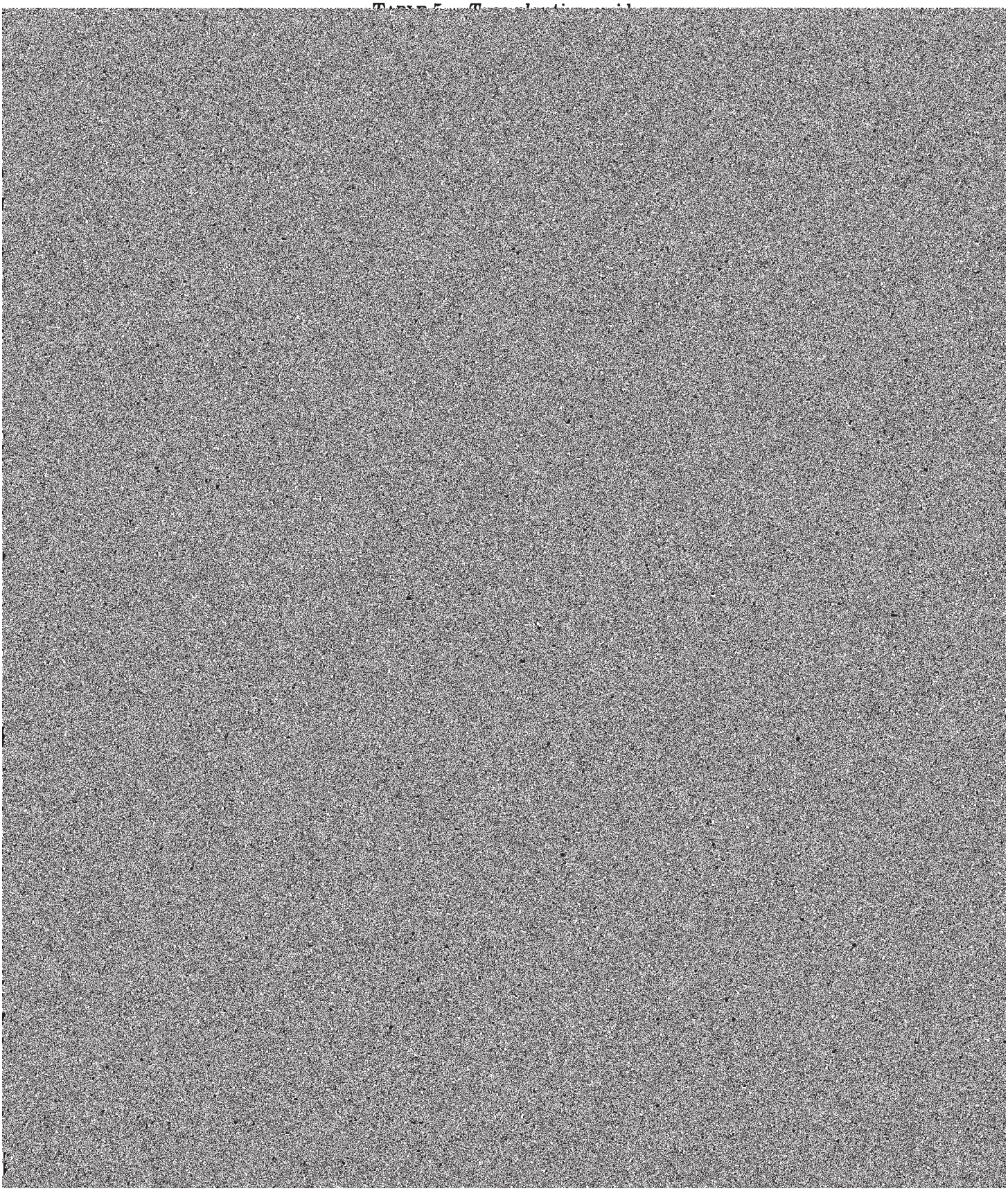


TABLE 5.—*Tree planting guide*—Continued

Tree planting group and map symbols	Forest trees	Ornamentals	Windbreak trees
Group 6: Somewhat excessively drained to excessively drained soils that have rapid and very rapid permeability. 88B, 98B, 741B, 741D, 741F, and 779B.	Eastern white pine and red pine.	For trees and shrubs that are less than 30 feet at maturity: Autumn-olive, spirea, and gray dogwood.	Red pine, eastern white pine, arborvitae, and Norway spruce.
Group 7: Very poorly drained organic soils that have rapid and moderately rapid permeability. 100 and 210.	Leave in natural state	Leave in natural state	Black willow, eastern larch, black spruce, and arborvitae.

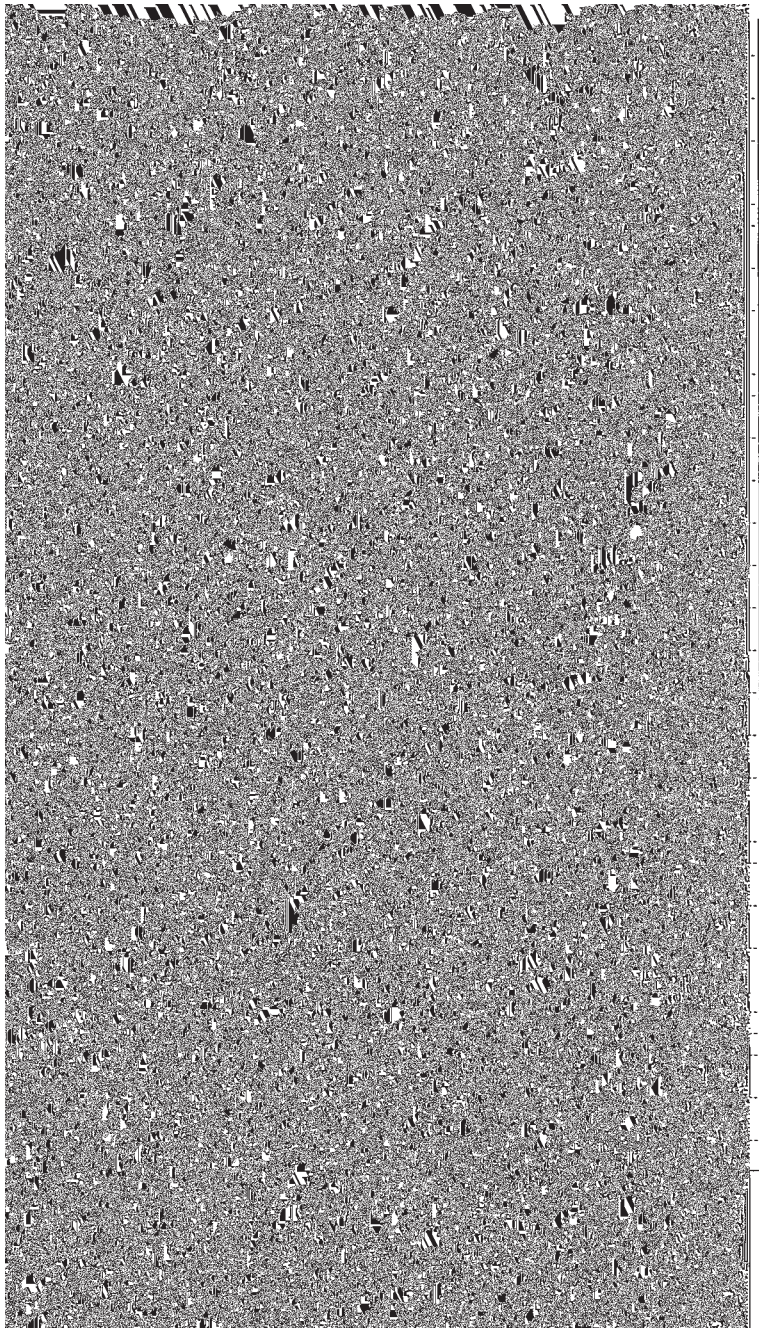
be created or improved by planting appropriate vegetation, by properly managing the existing plant cover, and by fostering the natural establishment of desirable plants.

In table 6 the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in—

1. Planning the use of parks, wildlife refuges, nature study areas, and other developments for wildlife.
2. Selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat.
3. Determining the intensity of management needed for each element of the habitat.
4. Determining which areas to acquire for wildlife management.

Figure 9.—**Natural reseeding in a 22-year-old pine planting on Oakville fine sand.**

r—
Wetland wildlife
oor.
ood.
ery poor.
ood.
ery poor.
ood.
ood.
ood.
ood.
ery poor.
ery poor.
ery poor.
air.
oor.
oor.
oor.
air.
air.
oor.
ery poor.
ery poor.
ood.
ood.
ood.
oor.
ery poor.
ood.
ood.
ery poor.



Good	Good	Fair	Fair	Good	Good	Fair.
Good	Good	Poor	Poor	Good	Good	Poor.
Good	Good	Fair	Fair	Good	Good	Fair.
Good	Good	Fair	Fair	Good	Good	Fair.
Good	Good	Poor	Poor	Good	Good	Poor.
Poor	Poor	Poor	Very poor	Poor	Poor	Very poor.
Fair	Fair	Poor	Very poor	Poor	Fair	Very poor.
Good	Good	Fair	Fair	Fair	Good	Fair.
Good	Good	Poor	Poor	Fair	Good	Poor.
Fair	Poor	Good	Good	Fair	Fair	Good.
Fair	Fair	Good	Good	Fair	Fair	Good.
Good	Good	Poor	Very poor	Good	Good	Very poor.
Good	Good	Poor	Poor	Good	Good	Poor.
Good	Good	Poor	Very poor	Good	Good	Very poor.
Fair	Fair	Fair	Very poor	Fair	Fair	Poor.
Good	Good	Poor	Poor	Good	Good	Poor.
Good	Good	Poor	Very poor	Good	Good	Very poor.
Poor	Poor	Poor	Poor	Fair	Poor	Poor.
Good	Good	Poor	Poor	Good	Good	Poor.
Good	Good	Very poor	Very poor	Good	Good	Very poor.
Fair	Poor	Good	Good	Fair	Fair	Good.
Good	Good	Fair	Fair	Good	Good	Fair.
Fair	Fair	Poor	Very poor	Poor	Fair	Very poor.
Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Fair	Fair	Good	Good	Fair	Fair	Good.
Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor.

The potential of the soil is rated *good, fair, poor,* or *very poor*. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderate intensity of management and fairly frequent attention are required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of habitat are very severe and that unsatisfactory results can be expected. Wildlife habitat is [illegible]

erties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness.

Coniferous plants are cone-bearing trees, shrubs, or ground cover that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Examples are pine, spruce, hemlock, fir, yew, cedar, and juniper. Major soil properties that affect the growth of coniferous plants are depth of the root zone, available water capacity, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Examples of wetland plants are smartweed, wild millet, rushes, sedges, reeds, wildrice, saltgrass, cordgrass, and cattail. Major soil properties affecting wetland plants are texture of the surface layer, wetness, re-

The ratings in tables in this section are based on test data and estimated data. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by the soil survey and used in determining the ratings in this section are grain-size distribution, liquid limit, plasticity index, soil reaction, depth to and hardness of bedrock within 5 or 6 feet of the surface, soil wetness characteristics, depth to a seasonal [illegible] likelihood of flooding, natural soil [illegible]

The information is presented mainly in tables. Table 7 shows for each kind of soil, ratings of the degree and kind of limitations for building site development. Table 8 shows the suitability of each kind of soil as a source of construction materials. Table 9 shows the engineering properties and classification of the soils. Table 10 shows the physical and chemical properties of soils and table 11, soil and water features. Table 12 shows the suitability of soils for sanitary facilities.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey can be used to make additional interpreta-

TABLE 7.—*Building site development*

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Watseka: 49	Severe: wetness, cutbanks cave.	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness, frost action.
Milford: 69	Severe: wetness	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: frost action, wetness, shrink-swell.
Sparta: 88B	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
Maumee: 89	Severe: wetness	Severe: wetness	Severe: wetness	[illegible]	[illegible]

TABLE 7.—*Building site development*—Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Varna: 223B	Moderate: too	Moderate: shrink-	Moderate: wetness,	Moderate: shrink-	Severe: low

TABLE 7.—*Building site development*—Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Markham:					
531B	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: wetness, low strength, shrink-swell.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.
531C2, 531C3	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: wetness, low strength, shrink-swell.	Moderate: shrink-swell, low strength, slope.	Severe: frost action, low strength.
Reddick: 594	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness, frost action.
Darroch: 740	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Severe: frost action.
Oakville:					
741B	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
741D	Severe: cutbanks cave.	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
741F	Severe: cutbanks cave, slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Comfrey: 776	Severe: wetness, floods.	Severe: wetness, floods, frost action.	Severe: wetness, floods.	Severe: wetness, floods, frost action.	Severe: wetness, floods, frost action.
Chelsea: 779B	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.

also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and

and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth

TABLE 8.—*Construction materials*

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor"]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Watseka: 49	Fair: wetness	Fair: excess fines	Unsuited	Poor: too sandy.
Milford: 69	Poor: frost action, shrink-swell, low strength.	Unsuited	Unsuited	Poor: wetness.
Sparta: 88B	Good	Good	Unsuited	Poor: too sandy.
Maumee: 89	Poor: wetness	Fair: excess fines	Unsuited	Poor: wetness.
Ade: 98B	Good	Fair: excess fines	Unsuited	Poor: too sandy.
Palms: 100	Poor: wetness, excess humus	Unsuited	Unsuited	Poor: wetness.
Sawmill: 107	Poor: wetness, frost action, low strength.	Unsuited	Unsuited	Poor: wetness.
Selma: 125, R125	Poor: wetness, frost action	Unsuited	Unsuited	Poor: wetness, area reclaim.
Alvin:				
131B, 131C2	Fair: frost action	Fair: excess fines	Unsuited	Good.
131F	Fair: frost action, slope	Fair: excess fines	Unsuited	Poor: slope.
Elliott: 146A, 146B	Poor: frost action	Unsuited	Unsuited	Fair: thin layer.
Onarga: 150A, 150B	Moderate: frost action, low strength.	Poor: excess fines	Unsuited	Good.
Hoopeston: 172	Poor: frost action	Fair: excess fines	Unsuited	Good.
Beardstown: 188	Poor: frost action	Poor: excess fines	Unsuited	Fair: thin layer.
Martinton: 189	Poor: frost action	Unsuited	Unsuited	Good.
Morley:				
194B, 194C	Poor: low strength	Unsuited	Unsuited	Fair: thin layer.
194E2	Poor: low strength	Unsuited	Unsuited	Poor: slope.
194C3	Poor: low strength	Unsuited	Unsuited	Fair: thin layer, slope.
Gilford: 201, W201	Poor: wetness, frost action	Fair	Unsuited	Poor: wetness.
Lena: 210	Poor: low strength, excess humus, wetness.	Unsuited	Unsuited	Poor: wetness.
Varna: 223B, 223C3	Poor: frost action, low strength	Unsuited	Unsuited	Fair: thin layer.
Ashkum: 232	Poor: frost action, wetness	Unsuited	Unsuited	Poor: wetness, too clayey.
Bryce: 235	Poor: frost action, wetness	Unsuited	Unsuited	Poor: too clayey.
Plattville: 240A, 240B	Fair: frost action, shrink-swell, area reclaim.	Unsuited	Unsuited	Fair: thin layer, area reclaim.
Andres: 293	Poor: frost action	Unsuited	Unsuited	Good.
Symerton: 294A, 294B	Poor: low strength	Unsuited	Unsuited	Fair: thin layer.
Mokena: 295	Poor: frost action, low strength	Unsuited	Unsuited	Fair: thin layer.
Beecher: 298A, 298B	Poor: frost action, low strength	Unsuited	Unsuited	Fair: thin layer.
Ritchey: 311B, 311D	Poor: thin layer	Unsuited	Unsuited	Poor: area reclaim.
Channahon: 315A, 315B	Poor: thin layer	Unsuited	Unsuited	Poor: thin layer.
Frankfort: 320A, 320B	Poor: frost action, low strength	Unsuited	Unsuited	Fair: thin layer.

TABLE 8.—*Construction materials*—Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Bonfield: 493	Poor: frost action, area reclaim	Poor: excess fines	Poor: excess fines	Poor: area reclaim.
Kankakee: 494A, 494B	Fair: frost action	Poor: excess fines	Poor: excess fines	Poor: area reclaim.
Morocco: 501	Moderate: frost action	Fair: excess fines	Unsuited	Poor: too sandy.
Rockton: 503A, 503B	Fair: thin layer	Unsuited	Unsuited	Good.
Whalan: 509A, 509B	Fair: thin layer	Unsuited	Unsuited	Fair: thin layer.
Faxon: 516	Poor: wetness, excess humus, frost action.	Unsuited	Unsuited	Poor: wetness.
Markham: 531B, 531C2, 531C3.	Poor: frost action, low strength	Unsuited	Unsuited	Fair: thin layer.
Reddick: 594	Poor: wetness, frost action	Unsuited	Unsuited	Poor: wetness.
Darroch: 740	Poor: frost action	Unsuited	Unsuited	Good.
Oakville:				
741B, 741D	Good	Good	Unsuited	Poor: too sandy.
741F	Fair: slope	Good	Unsuited	Poor: too sandy, slope.
Comfrey: 776	Poor: wetness, frost action	Unsuited	Unsuited	Poor: wetness.
Chelsea: 779B	Good	Fair: excess fines	Unsuited	Poor: too sandy.

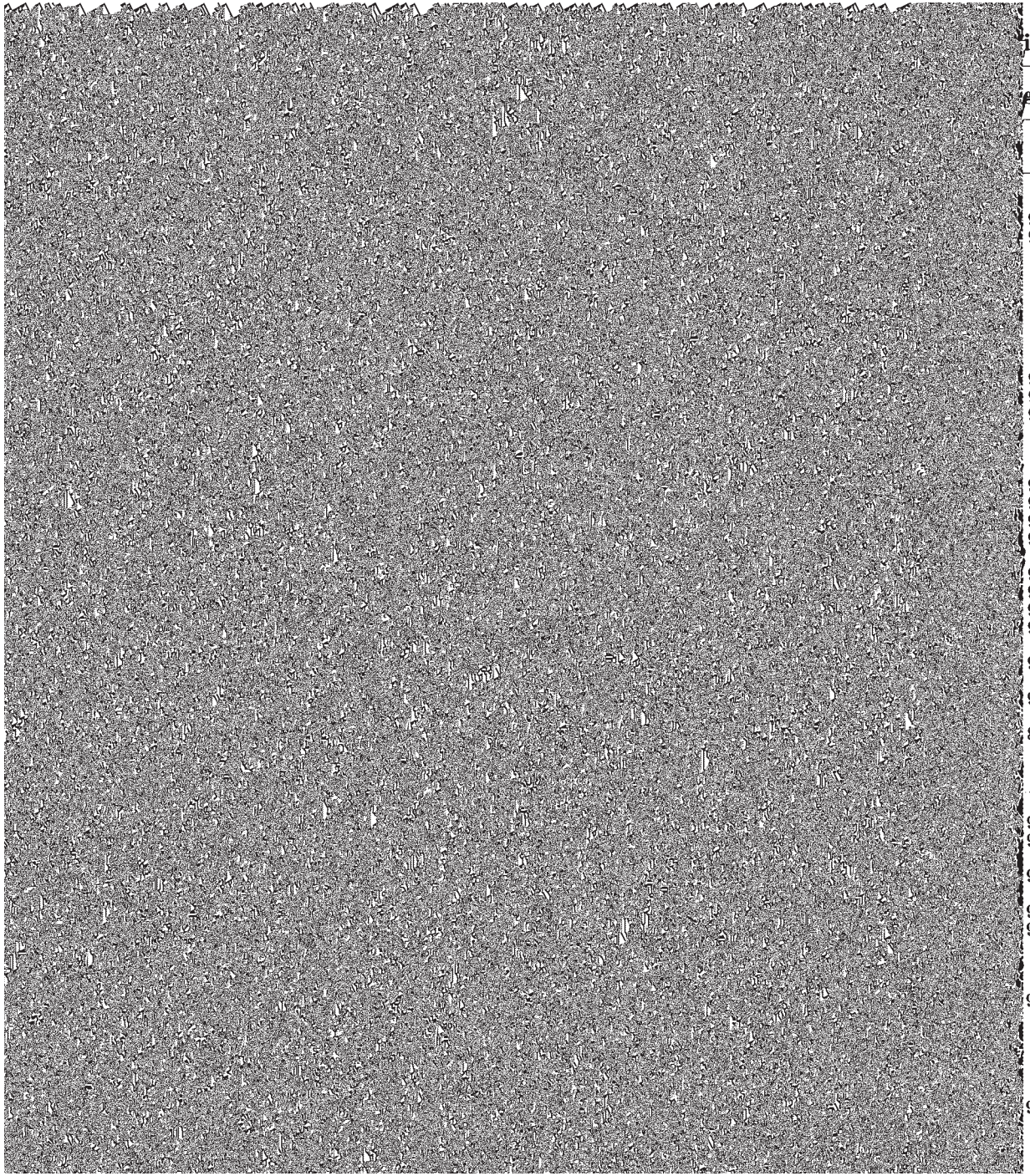
Sand and gravel are used in great quantities in many kinds of construction. The ratings in table 8 provide guidance as to where to look for probable sources and

Soils rated *poor* are very sandy soils, very firm clayey soils, soils with suitable layers less than 8 inches thick, soils having large amounts of gravel, stones or

BLE 9.—*Engineering properties and classifications*

an; > means greater than. Absence of an entry means data were not estimated]

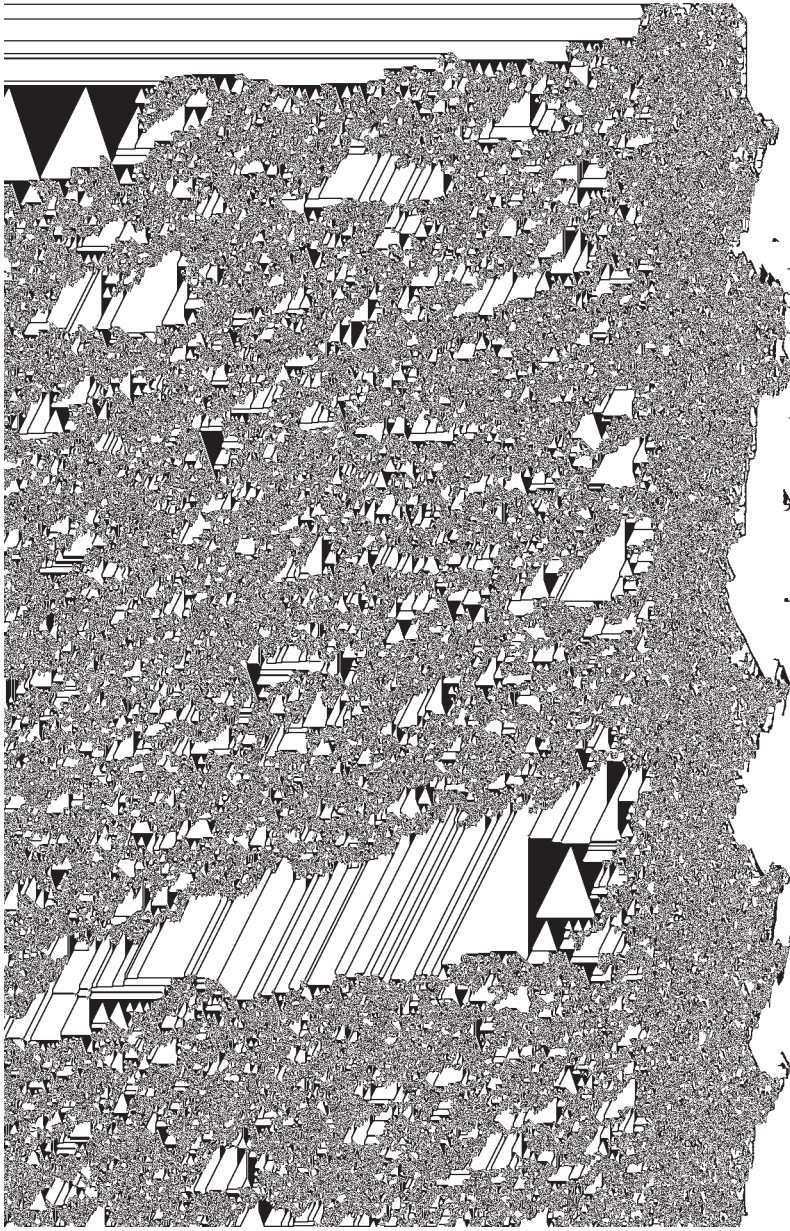
re	Classification		Frag-ments >3 inches	Percentage passing sieve number—				Liquid limit	Plas-ticity index
	Unified	AASHTO		4	10	40	200		
			Pct					*Pct*	
.....	SM	A-2	0	100	95-100	80-100	17-35	<25	NP-5
my	SP, SM	A-3, A-2	0	90-100	90-100	60-80	3-25	.....	NP
.....	CL, CH	A-7	0	100	95-100	90-100	80-95	40-60	20-35
y loam,	CH, CL	A-7	0	100	95-100	90-100	75-100	40-60	20-40
ndy loam..	CL	A-6, A-7	0	97-100	95-100	90-100	70-100	30-50	15-30
.....	SM, SP-SM	A-2	0	100	100	60-70	10-20	.....	NP
.....	SP	A-3	0	100	100	65-75	1-5	.....	NP
.....	SM	A-2-4, A-2-5	0	95-100	90-100	65-85	20-30	<30	NP-5
.....	SP, SP-SM	A-1-B, A-3	0	85-100	75-95	18-60	3-10	<30	NP
.....	SM	A-2-4	0	100	100	65-80	10-35	.....	NP
ne sand....	SP, SM	A-3, A-2-4	0	100	100	65-80	3-15	.....	NP
.....	Pt								
lt loam,	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-80	<30	5-15
.....	CL	A-6, A-7	0	100	100	95-100	80-100	30-50	15-30
loam to	CL	A-4, A-6, A-7	0	100	100	95-100	70-100	25-45	8-30
.....	SC, CL	A-4, A-6	0	100	98-100	90-100	35-70	26-35	7-17
andy	CL, SC	A-6	0	100	95-100	90-100	38-75	24-36	11-19
lt loam.....	CL, SC, SM, ML	A-4, A-6, A-2	0	90-100	85-100	65-100	18-67	<35	NP-21
.....	SC, CL	A-4, A-6	0	100	98-100	90-100	35-70	26-35	7-17
andy	CL, SC	A-6	0	100	95-100	90-100	38-75	24-36	11-19
ck.									
.....	SM, ML	A-4, A-2	0	100	100	80-95	30-60	15-28	NP-4
ay loam,	SC, CL, SM	A-4, A-6, A-2	0	100	100	90-100	20-80	15-38	NP-13
m to	SP-SM, SM	A-2, A-3	0-5	95-100	90-100	70-95	4-35	10-20	NP-4
.....	CL	A-6, A-7	0	95-100	95-100	95-100	80-99	35-50	12-18
y loam.....	CH, CL	A-6, A-7	0-5	95-100	95-100	90-100	75-99	30-52	11-26
y loam.....	CL	A-6, A-7	0-5	95-100	95-100	90-100	70-95	28-45	11-24
.....	SC, SM	A-2, A-4, A-6	0	100	100	75-95	25-50	5-28	NP-12
oam,	SC, CL, SM-SC, CL-ML	A-4, A-6	0	95-100	95-100	75-95	36-60	19-32	5-14
ndy loam..	SM	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6



inued

ge passing sieve number—			Liquid limit	Plas-ticity index
10	40	200		
			Pct	
90–100	70–90	25–45	20–40	5–10
90–100	50–80	5–20	<25	NP–10
100	80–95	50–65	20–30	5–15
100	80–90	40–60	25–35	7–15
100	20–50	15–45	<15	NP–5
95–100	90–100	75–95	34–49	13–19
95–100	90–100	70–95	41–55	15–32
95–100	90–100	35–90	25–50	NP–25
95–100	90–100	85–95	25–40	5–15
90–100	85–95	80–90	25–40	10–20
90–100	85–95	80–90	30–55	15–30
90–100	85–95	80–90	30–45	15–25
95–100	90–100	85–95	25–40	10–20
90–100	85–95	80–90	25–40	10–20
90–100	85–95	80–90	30–55	15–30
90–100	85–95	80–90	30–45	15–25
90–100	65–80	35–45	16–22	2–10
90–100	55–70	25–35	20–30	2–8
85–100	18–60	3–18	.....	NP
95–100	95–100	85–95	25–40	8–20
95–100	90–98	80–98	33–56	15–29
95–100	90–98	80–95	30–45	13–26
98–100	95–100	75–100	45–65	20–35
95–100	90–100	75–95	35–50	15–30
100	95–100	80–100	45–60	20–31
100	95–100	85–100	47–62	25–40
95–100	95–100	70–95	35–60	21–38
100	95–100	90–100	30–40	8–20
100	95–100	90–100	35–50	11–25
90–100	85–100	80–95	35–50	11–25

t loam	CL	A–7, A–6	0	95–100	95–100	90–99	80–94	35–45	11–20
ty clay loam, clay loam, sandy clay loam.	CL, CH	A–7	0–5	95–100	95–100	95–100	80–99	41–56	16–32
ty clay loam	CL	A–6, A–7	0–5	95–100	95–100	85–100	70–95	28–48	11–26
t loam	CL, ML	A–7, A–6	0	95–100	95–100	90–100	60–95	35–50	11–20
ndy clay loam, clay loam, silty clay loam.	CL, CH	A–7, A–6	0–5	98–100	95–100	95–100	70–85	30–57	15–32
ty clay loam	CL	A–7, A–6	0–10	95–100	95–100	85–100	75–85	30–45	13–26
am	CL	A–6, A–7	0	95–100	95–100	85–100	75–90	31–45	11–24
ay loam, silty clay loam	CL	A–7, A–6	0	95–100	95–100	85–100	80–95	36–47	13–26
ty clay, clay	CH, CL	A–7, A–6	0–5	95–100	90–100	85–100	75–95	35–55	14–31
t loam	CL, ML	A–6, A–4, A–7	0	95–100	95–100	90–100	85–95	30–45	10–20
ty clay, silty clay loam	CL	A–6, A–7	0	95–100	95–100	90–100	85–95	35–50	15–26
ty clay loam, clay loam	CL	A–6	0–5	90–100	90–100	85–95	80–90	28–40	10–20
t loam	ML, CL	A–4, A–6	0	95–100	95–100	90–100	70–95	20–35	1–15
ay loam	CL	A–6	0–35	95–100	95–100	90–100	65–90	25–40	10–20
nweathered bedrock.									
t loam	CL	A–6, A–4	0–20	95–100	95–100	85–100	65–90	21–38	7–18
am, sandy clay loam, silty clay loam.	CL	A–6, A–7	0–20	95–100	90–100	85–100	50–85	20–35	10–20
nweathered bedrock.									
t loam	CL	A–6, A–7	0	100	98–100	90–98	75–95	34–45	11–19
ty clay	CH, CL	A–7	0–5	95–100	95–100	90–100	60–95	41–54	14–28
ty clay loam	OH, CH, CL	A–7	0	100	95–100	95–100	80–100	41–65	18–35
ty clay loam, silty clay	CH, CL	A–7	0–5	100	95–100	90–100	85–100	41–70	17–39
ty clay loam	CL, CH	A–7, A–6	0–5	95–100	95–100	90–100	75–98	30–60	14–29
am	CL–ML	A–4	0	100	100	85–95	50–75	20–35	5–10
ne sandy loam, very fine sandy loam, loam.	ML, SM	A–4	0	100	100	70–90	35–60	<30	NP–5
ne sand, loamy fine sand	SM, SP–SM	A–2, A–3	0	100	100	75–85	5–35	----------	NP
t loam	CL, CL–ML	A–4, A–6	0	100	100	90–100	70–90	25–35	5–15
am	CL	A–6	0	100	100	85–95	60–75	20–35	10–20
ndy clay loam, clay loam, silty clay loam.	SC, CL	A–6	0	100	100	80–95	45–85	20–35	10–20
ndy loam and sand	SC, SM–SC	A–4, A–2–4	0	100	100	60–70	30–40	20–30	5–10
am	SM–SC, SC, CL–ML	A–4, A–2, A–6	0–10	70–95	55–75	50–70	30–55	15–40	5–15
ery cobbly fine sandy loam, very cobbly loam, cobbly fine sandy loam.	SM–SC, SC, SM	A–2	30–80	70–90	45–70	25–60	10–35	15–40	5–10
ne sandy loam, sandy clay loam.	SM–SC, SC	A–4, A–2, A–6	0–10	70–95	55–75	50–70	30–50	15–40	5–15
ery cobbly loam, very cobbly fine sandy loam.	SM–SC, SC, SM	A–2, A–1	30–80	70–90	45–70	25–60	10–35	15–40	5–10
ne sand	SM	A–2–4	0	100	100	65–80	20–35	<10	NP–5
ne sand, sand	SM, SP–SM	A–3, A–2–4	0	100	80–90	50–70	5–25	----------	NP
oam	ML, CL–ML	A–4	0	90–100	90–100	85–95	50–75	25–35	5–10
lay, clay loam, silty clay	CH, CL, MH	A–7	0–2	90–100	90–100	90–95	70–90	40–60	20–30
eathered bedrock.									
ery fine sandy loam, loam	CL	A–6	0	95–100	95–100	80–95	70–90	30–40	10–15
lay loam, loam, sandy loam	CL, CH, MH	A–7	0–2	90–100	80–95	80–90	60–75	40–60	20–30
eathered bedrock.									



· *roperties and classifications*—Continued

Classification		Frag-ments >3 inches	Percentage passing sieve number—				Liquid limit	Plas-ticity index
ed	AASHTO		4	10	40	200		
		Pct					*Pct*	
ML	A-7	0-10	95-100	90-100	85-100	80-95	40-50	15-25
SC	A-7, A-6	0-10	95-100	90-100	70-95	50-85	30-50	10-20
-ML	A-6, A-4	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	A-7, A-6	0-10	95-100	90-100	85-100	80-90	30-54	15-28
	A-7, A-6	0-10	95-100	90-100	85-95	80-90	30-45	13-26
ML	A-6, A-4	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	A-7	0-10	95-100	90-100	85-100	80-90	30-54	15-28
	A-7, A-6	0-10	95-100	90-100	85-95	80-90	30-45	13-26
	A-6, A-7	0	95-100	85-95	85-95	75-90	30-50	10-25
	A-6, A-7	0-5	95-100	80-90	80-90	65-90	30-50	10-25
	A-6, A-7	0-10	95-100	90-100	85-95	80-95	35-55	15-30
ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	A-6, A-7	0	100	100	90-100	70-80	35-50	15-25
ML, M-SC	A-4	0	100	100	75-90	35-85	<30	5-10
	A-2	0	100	100	70-85	20-35	.....	NP
	A-2	0	100	95-100	70-95	15-25	.....	NP
ML	A-7	0	100	100	85-98	65-85	45-60	12-20
	A-7, A-6	0	100	100	80-98	60-85	35-50	12-25
	A-2-4	0	100	100	65-80	10-35	.....	NP
	A-3, A-2-4	0	100	100	65-80	3-15	.....	NP

gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms used by USDA are defined in the Glossary.

Physical and chemical properties

Table 10 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given

TABLE 10.—*Physical and chemical properties*

[Dashes indicate data were not available. The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
							Uncoated steel	Concrete	K	T	
	In	*In/hr*	*In/in*	*pH*	*Mmhos/cm*						
Watseka: 49	0–10	6.0–20	0.07–0.12	6.1–7.3	<2	Very low	Low	Moderate			2
	10 60	6.0–20	0.05–0.10	5.1–7.3	<2	Very low	Low	High			
Milford: 69	0–16	0.6–2.0	0.12–0.23	6.1–7.3	<2	High	High	Low			4
	16–47	0.2–0.6	0.11–0.20	6.6–7.8	<2	High	High	Low			
	47–60	0.2–0.6	0.14–0.20	7.4–8.4	<2	Moderate	High	Low			
Sparta: 88B	0–20	>20	0.12–0.14	5.6–6.0	<2	Low	Low	Low	0.17	5	2
	20–60	>20	0.06–0.08	5.6–6.0	<2	Low	Low	Low	0.17		
Maumee: 89	0–18	6.0–20	0.10–0.12	6.1–6.5	<2	Low	High	Moderate			2
	18–60	>20	0.05–0.07	6.1–7.8	<2	Low	High	Moderate			
Ade: 98B	0–14	6.0–20	0.10–0.12	5.1–6.5	<2	Low	Low	High	0.17	5	2
	14–66	6.0–20	0.06–0.08	5.1–6.0	<2	Low	Low	High	0.17		
	35–60	6.0–20	0.06–0.08	5.1–6.0	<2	Low	Low	High	0.17		
	60–70	6.0–20	0.06–0.08	6.1–8.4	<2	Low	Low	High	0.17		
Palms: 100	0–37	0.2–6.0	0.35–0.45	5.1–7.8	<2		High	Moderate			3
	37–60	0.6–2.0	0.05–0.19	6.1–8.4	<2	Low	High	Low			
Sawmill: 107	0–53	0.2–2.0	0.18–0.23	6.1–7.8	<2	Moderate	High	Low			7
	53–60	0.2–2.0	0.11–0.20	7.4–8.4	<2	Moderate	High	Low			
Selma:											
125	0–14	0.6–2.0	0.17–0.22	6.1–7.8	<2	Moderate	High	Low			6
	14–38	0.6–2.0	0.15–0.19	6.1–7.8	<2	Moderate	High	Low			
	38–60	0.6–6.0	0.05–0.22	6.1–7.8	<2	Low	High	Low			
R125	0–14	0.6–2.0	0.17–0.22	6.1–7.8	<2	Moderate	High	Low			6
	14–38	0.6–2.0	0.15–0.19	6.1–7.8	<2	Moderate	High	Low			
	38										
Alvin: 131B, 131C2, 131F	0–12	2.0–6.0	0.14–0.20	5.1–6.5	<2	Low	Low	High	0.24	5	3
	12–44	2.0–6.0	0.12–0.20	4.5–6.0	<2	Low	Low	High	0.24		
	44–64	6.0–20	0.05–0.13	5.1–7.8	<2	Low	Low	High	0.24		
Elliott: 146A, 146B	0–14	0.6–2.0	0.21–0.24	5.6–6.5	<2	Moderate	High	Moderate	0.32	4	6
	14–41	0.2–0.6	0.11–0.20	5.6–7.8	<2	Moderate	High	Moderate	0.32		
	41–60	0.2–0.6	0.14–0.20	7.4–8.4	<2	Moderate	High	Low	0.32		
Onarga: 150A, 150B	0–12	0.6–2.0	0.13–0.22	5.6–6.5	<2	Low	Low	Moderate	0.20	4–3	3
	12–29	0.6–2.0	0.15–0.19	5.1–6.5	<2	Low	Low	High	0.20		
	29–60	6.0–20	0.05–0.13	5.1–7.8	<2	Low	Low	High	0.15		
Hoopeston: 172	0–46	2.0–6.0	0.12–0.15	5.1–6.5	<2	Low	Moderate	High			3
	46–60	6.0–20	0.05–0.10	5.6–7.8	<2	Very low	Low	Moderate			
Beardstown: 188	0–14	0.6–2.0	0.17–0.24	5.6–6.5	<2	Low	High	Moderate	0.28	5	5
	14–50	0.6–2.0	0.15–0.19	4.5–6.0	<2	Low	High	High	0.28		
	50–60	2.0–6.0	0.08–0.18	5.1–6.0	<2	Low	Moderate	Moderate	0.17		
Martinton: 189	0–13	0.6–2.0	0.22–0.24	5.1–6.5	<2	Low	High	Moderate	0.32	5	6
	13–37	0.2–0.6	0.11–0.20	5.6–7.8	<2	Moderate	High	Moderate	0.43		
	37–60	0.06–0.2	0.11–0.22	7.9–8.4	<2	Moderate	High	Low	0.43		

r	Moderate	0.43	3–2	6
derate	Moderate	0.43		
h	Moderate	0.43		
derate	Low	0.43		
h	Moderate			3
h	Moderate			
h	Low			
h	Low			3
derate	Low	0.32	4–3	6
derate	Moderate	0.32		
derate	Low	0.32		
h	Moderate			4
h	Low			
h	Moderate			4
h	Low			
h	Low			
derate	Low	0.32	4	6
h	Moderate	0.32		
h	Low	0.32		
h	Low	0.28	5	6
h	Low	0.28		
h	Low	0.37		
w	Moderate	0.32	5–4	6
derate	Moderate	0.32		
derate	Low	0.43		
h	Moderate	0.28	4	6
h	Moderate	0.28		
h	Low	0.28		
h	High	0.37	3–2	6
h	High	0.37		
h	Low	0.37		
w	Low	0.37	2	6
derate	Low	0.37		
w	Low	0.37	2–1	6
derate	Low	0.37		
h	Moderate	0.37	3–2	6
h	Low	0.37		
h	Moderate			4
h	Low			
h	Low			
w	Low			4L
w	Low			
w	Low			
w	Moderate	0.28	5	5
w	Moderate	0.28		
derate	Moderate	0.28		
w	Moderate	0.28		
w	Low	0.28		

hemical properties—Continued

Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
		Uncoated steel	Concrete	K	T	
Mmhos/cm						
<2	Low	Low	Low	0.24	3	5
<2	Low	Low	Low	0.15		
<2	Low	Low	Low	0.20	3	3
<2	Low	Low	Low	0.15		
<2	Low	Low	High			1
<2	Low	Low	High			
<2	Low	Low	Low	0.28	4–3	6
<2	High	Low	Low	0.28		
<2	Moderate	Moderate	Low	0.32		
<2	High	High	Moderate	0.32		
<2	Moderate	High	Low			6
<2	Moderate	High	Low			
<2	Low	Low	Moderate	0.37	3–2	6
<2	Moderate	Moderate	Moderate	0.37		
<2	Low	Moderate	Low	0.37		
<2	Moderate	High	Low			7
<2	Moderate	High	Low			
<2	Moderate	High	Low			
<2	Low	High	High			5
<2	Moderate	High	High			
<2	Low	High	Low			
<2	Low	Low	Moderate	0.15	5	1
<2	Low	Low	Moderate	0.15		
<2	Moderate	High	Low			6
<2	Moderate	High	Low			
<2	Low	Low	Low	0.17	5	2
<2	Low	Low	Low	0.17		

potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rating of soils for corrosivity to concrete is based mainly on the sulfate content, soil texture, and acidity. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Installations of steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely within one kind of soil or within one soil horizon.

ate. These soils are very slightly erodible, and crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to soil blowing.

Soil and water features

Features that relate to runoff or infiltration of water, to flooding, and to frost action of each soil are indicated in table 11. This information is helpful in planning land uses and engineering projects that are likely to be affected by the amount of runoff from watersheds, by flooding and a seasonal high water table, by bedrock or a cemented pan in the upper 5 or 6 feet

TABLE 11.—*Soil and water features*

[Absence of an entry indicates the feature is not a concern. The definitions of "flooding" and "water table" in the Glossary explain terms such as "brief," "common," "apparent," and "perched." The symbol > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	
					Ft			*In*		
Watseka: 49	B	None			1.0–3.0	Apparent	Feb-May	>60		Moderate.
Milford: 69	B/D	Occasional	Brief	Apr-Jun	0–2.0	Apparent	Mar-Jun	>60		High.
Sparta: 88B	A	None			>6.0			>60		Low.
Maumee: 89	A/D	None			0–1.0	Apparent	Dec-May	>60		High.
Ade: 98B	A	None			>6.0			>60		Low.
Palms: 100	A/D	Frequent	Long	Nov-May	0–1.0	Apparent	Nov-May	>60		High.
Sawmill: 107	B/D	Frequent	Brief	Mar-Jun	0–2.0	Apparent	Mar-Jun	>60		High.
Selma:										
125	B/D	Occasional	Brief	Apr-Jun	0–2.0	Apparent	Mar-Jun	>60		High.
R125	B/D	Occasional	Brief	Apr-Jun	0–2.0	Apparent	Mar-Jun	38–60	Hard	High.

TABLE 11.—*Soil and water features*—Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	
					Ft			*In*		
Frankfort: 320A, 320B	D	None			1.0–3.0	Perched	Mar-Jun	>60		High.
Peotone: 330	B/D	Occasional	Long	Feb-Jul	0–1.0	Perched	Feb-Jul	>60		High.
Fieldon: 380	B/D	None			1.0–3.0	Apparent	Nov-Jun	>60		High.
Jasper: 440A, 440B	B	None			>6.0			>60		Moderate.
Bonfield: 493	B	None			1.0–3.0	Apparent	Apr-Jun	>60		High.
Kankakee: 494A, 494B	B	None			>6.0			>60		Moderate.
[illegible]	[illegible]	[illegible]			1.0–3.0	Apparent	Jan-Apr	>60		Moderate.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that deal with the ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 12 shows the degree and kind of limitations of each soil for these uses and for use of the soil as daily cover for landfills.

If the degree of soil limitation is indicated by the rating *slight*, soils are favorable for the specified use

very high in organic matter and those that have stones and boulders are undesirable. Unless the soil has very slow permeability, contamination of local ground water is a hazard in areas where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce its capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the location of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soils affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste, either in excavated trenches or on the surface of the soil. The waste is spread compacted in layers and

TABLE 12.—*Sanitary facilities*

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Watseka: 49	Severe: wetness	Severe: seepage, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: too sandy.
Milford: 69	Severe: wetness, percs slowly.	Slight	Severe: wetness	Severe: wetness	Poor: wetness, too clayey.
Sparta: 88B	Slight	Severe: seepage	Severe: seepage	Severe: seepage	Fair: too sandy.
Maumee: 89	Severe: wetness	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness, seepage, too sandy.

TABLE 12.—*Sanitary facilities*—Continued

Water Management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 13 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the rated use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for this use have low seepage potential, which is determined by the permeability and depth over fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and is of favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

An *aquifer-fed excavated pond* is a body of water created by excavating a pit or dugout into a groundwater aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 13 are for ponds that are properly de-

Grassed waterways channel runoff at nonerosive velocities to outlets. Features that affect the use of soils for waterways are slope, permeability, erodibility, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 14 according to limitations that affect their suitability for camp areas, picnic areas, playgrounds, and paths and trails. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreational use by the duration of flooding and the season when it occurs. Onsite assessment of height, duration, and frequency of flooding is essential in planning recreational facilities.

In table 14 the limitations of soils are rated as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the 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 14 can be supplemented by additional information in other parts of this survey.

TABLE 13.—*Water management*

[describe restrictive soil features are defined in the Glossary. Absence of an entry means soil was not evaluated]

Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Piping, seepage	Deep to water	Cutbanks cave	Wetness, seepage	Not needed	Not needed.
Shrink-swell, low strength.	Favorable	Percs slowly	Wetness, slow intake.	Not needed	Not needed.
Piping	No water	Not needed	Seepage, droughty	Too sandy	Droughty.
Seepage, piping	Favorable	Cutbanks cave, wetness.	Wetness, fast intake, seepage.	Not needed	Not needed.
Seepage	No water	Not needed	Droughty, soil blowing, fast intake.	Too sandy, soil blowing, piping.	Droughty.
Compressible, hard to pack, low strength.	Favorable	Wetness, floods, cutbanks cave.	Wetness, fast intake, soil blowing.	Not needed	Not needed.
Shrink-swell, low strength.	Favorable	Floods	Wetness, floods	Not needed	Not needed.
Favorable	Seepage	Wetness	Wetness	Not needed	Not needed.
Seepage	No water	Not needed	Favorable	Favorable	Favorable.
Low strength	Deep to water	Favorable	Wetness, slow intake.	Percs slowly	Favorable.
Favorable	No water	Not needed	Favorable	Favorable	Favorable.
Seepage, piping	Slow refill	Favorable	Wetness, fast intake.	Not needed	Not needed.
Favorable	Deep to water	Favorable	Wetness	Favorable	Favorable.
Low strength	Deep to water	Percs slowly	Wetness, slow intake.	Not needed	Favorable.
Low strength, shrink-swell.	Deep to water	Not needed	Slow intake, percs slowly.	Erodes easily, percs slowly.	Erodes easily.
Seepage	Favorable	Cutbanks cave	Wetness	Not needed	Favorable.
Hard to pack, low strength, excess humus.	Favorable	Cutbanks cave, floods, poor outlets.	Wetness	Not needed	Not needed.
Low strength	Deep to water	Not needed	Slow intake, erodes easily.	Percs slowly	Erodes easily.
Low strength, shrink-swell.	Favorable	Wetness, percs slowly.	Wetness	Not needed	Not needed.
Low strength, hard to pack.	Slow refill	Percs slowly, floods.	Wetness, slow intake.	Not needed	Not needed.

ed	Favorable	Depth to rock	Favorable.
	Wetness	Favorable	Favorable.
d	Favorable	Favorable	Favorable.
ly	Wetness, slow intake.	Percs slowly	Wetness.
ly	Wetness, slow intake.	Percs slowly	Erodes easily, percs slowly.
d	Rooting depth	Depth to rock	Rooting depth.
ed	Rooting depth	Depth to rock	Rooting depth.
ly	Wetness, slow intake.	Percs slowly	Erodes easily, percs slowly.
ly,	Wetness, slow intake.	Not needed	Not needed.
cave,	Wetness	Wetness	Wetness.
d	Favorable	Favorable	Favorable.
	Wetness	Large stones	Large stones.
d	Favorable	Large stones	Large stones.
cave	Droughty, fast intake, wetness.	Not needed	Not needed.
ed	Rooting depth	Depth to rock	Depth to rock.
ed	Favorable	Depth to rock	Rooting depth.
depth	Wetness	Not needed	Wetness, depth to rock.
ed	Slow intake, erodes easily.	Percs slowly	Erodes easily.
ly	Wetness, slow intake.	Not needed	Not needed.
ly,	Percs slowly, wetness.	Not needed	Not needed.
ed	Fast intake, seepage, soil blowing.	Complex slope, soil blowing.	Droughty, soil blowing.
floods	Wetness, floods	Not needed	Wetness.
ed	Droughty, erodes easily, seepage.	Complex slope, piping, too sandy.	Droughty, erodes easily, slope.

TABLE 14.—*Recreational development*

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Watseka: 49	Moderate: wetness	Moderate: wetness	Moderate: wetness, too sandy.	Moderate: wetness.
Milford: 69	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Sparta: 88B	Moderate: too sandy	Moderate: too sandy	Moderate: too sandy, slope.	Moderate: too sandy.
Maumee: 89	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Ade: 98B	Moderate: too sandy	Moderate: too sandy	Moderate : too sandy	Moderate: too sandy.
Palms: 100	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.
Sawmill: 107	Severe: floods, wetness	Severe: wetness	Severe: wetness, floods	Severe: wetness.
Selma: 125, R125	Severe: wetness, floods	Severe: wetness	Severe: wetness	Severe: wetness.
Alvin:				
131B	Slight	Slight	Moderate: slope	Slight.
131C2	Slight	Slight	Severe: slope	Slight.
131F	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Elliott:				
146A	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly.	Moderate: wetness.
146B	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly, slope.	Moderate: wetness.
Onarga:				
150A	Slight	Slight	Slight	Slight.
150B	Slight	Slight	Moderate: slope	Slight.
Hoopeston: 172	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness.
Beardstown: 188	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness.
Martinton: 189	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly.	Moderate: wetness.
Morley:				
194B	Moderate: percs slowly	Slight	Moderate: percs slowly, slope.	Slight.
194C	Moderate: percs slowly	Slight	Severe: slope	Slight.
194E2	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
194C3	Moderate: percs slowly, slope.	Moderate: slope	Severe: slope	Slight.
Gilford: 201, W201	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Lena: 210	Severe: floods, wetness, excess humus.	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Varna: 223B, 223C3	Moderate: percs slowly	Slight	Moderate: percs slowly, slope.	Slight.
Ashkum: 232	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Bryce: 235	Severe: wetness, too clayey.	Severe: wetness, too clayey.	Severe: wetness, too clayey.	Severe: wetness.
Plattville:				
240A	Slight	Slight	Slight	Slight.
240B	Slight	Slight	Moderate: slope	Slight.
Andres: 293	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness.
Symerton:				
294A	Slight	Slight	Slight	Slight.
294B	Slight	Slight	Moderate: slope	Slight.

TABLE 14.—*Recreational development*—Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Mokena: 295	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly.	Moderate: wetness.
Beecher:				
298A	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly.	Moderate: wetness.
298B	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly, slope.	Moderate: wetness.
Ritchey:				
311B	Slight	Slight	Severe: depth to rock	Slight.
311D	Moderate: slope	Moderate: slope	Severe: depth to rock, slope.	Slight.
Channahon: 315A, 315B	Slight	Slight	Severe: depth to rock	Slight.
Frankfort:				
320A	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly.	Moderate: wetness.
320B	Moderate: wetness, percs slowly.	Moderate: wetness	Moderate: wetness, percs slowly, slope.	Moderate: wetness.
Peotone: 330	Severe: wetness, floods	Severe: wetness, floods	Severe: wetness, too clayey.	Severe: wetness.
Fieldon: 380	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Jasper:				
440A	Slight	Slight	Slight	Slight.
440B	Slight	Slight	Moderate: slope	Slight.
Bonfield: 493	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness.
Kankakee:				
494A	Slight	Slight	Slight	Slight.
494B	Slight	Slight	Moderate: slope	Slight.
Morocco: 501	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.
Rockton:				
503A	Slight	Slight	Moderate: depth to rock.	Slight.
503B	Slight	Slight	Moderate: depth to	Slight.

to obtain a uniform grade, the depth of the soil over rock should be sufficient to allow necessary grading.

The design and layout of paths and trails for walking, horseback riding, and bicycling should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Formation and Classification of Soils

This section tells how the factors of soil formation have affected the development of the soils in the county and explains the system of soil classification currently used and places each soil series in the classes of that system.

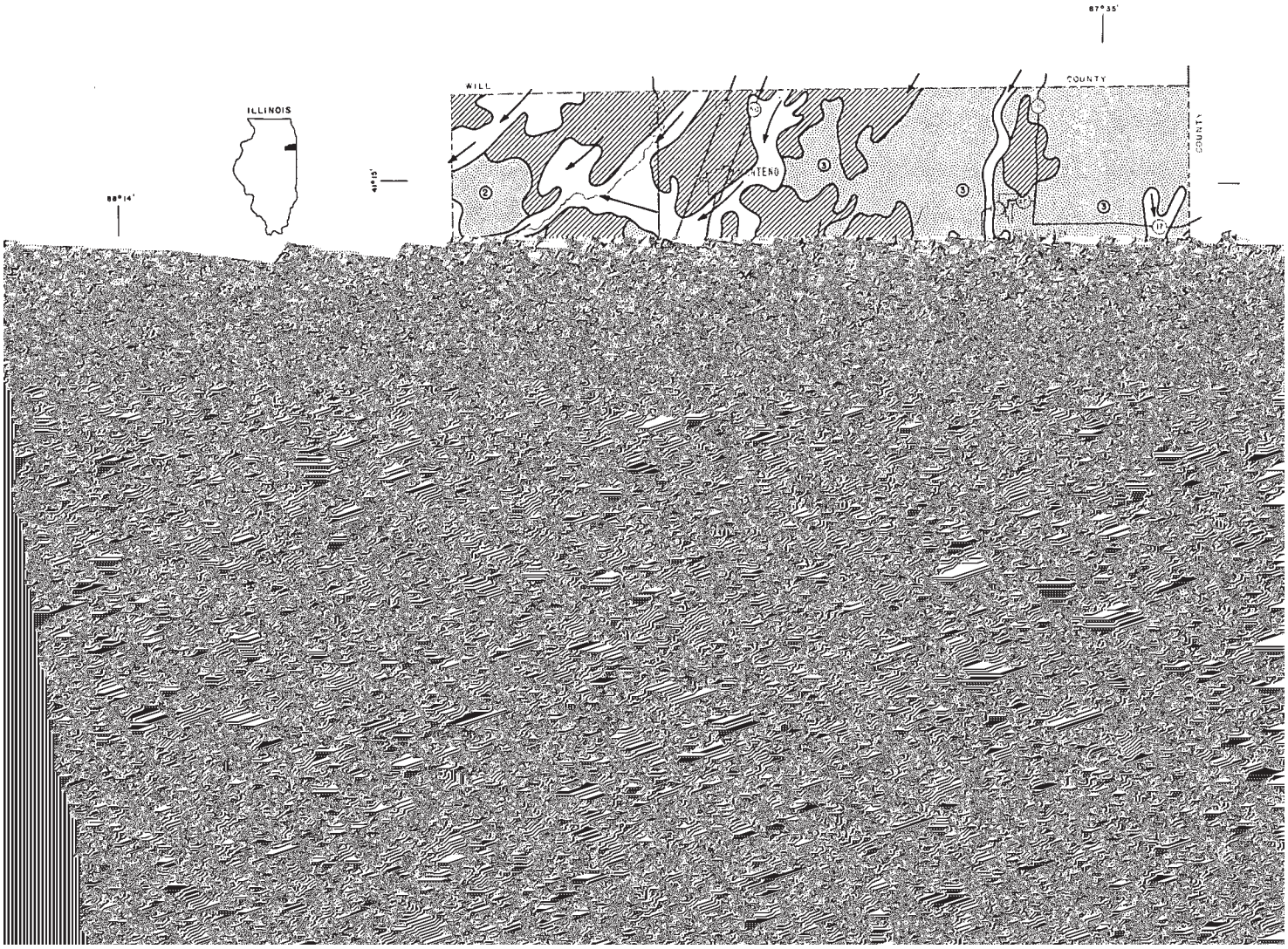
Factors of Soil Formation

The principal factors of soil formation are parent material, climate, plant and animal life, relief and drainage, and time. All five of these factors come into play in the formation of every soil. The relative importance of each factor differs from place to place, and each modifies the effect of the other four. In some cases one factor may dominate the formation of a particular soil.

Parent material

Parent material of the soils in Kankakee County are of glacial origin and of the Wisconsin stage of the Pleistocene deposits. The materials are glacial till, glacial drift (stratified till and outwash), glacial outwash, and lacustrine (glacial lakebed). Alluvium (bottom land) and organic soils are primarily post-glacial in origin.

Pre-Pleistocene soils, developed from the underlying bedrock, are not found in the county. In soils that are shallow to limestone bedrock, such as Channahon and Ritchey soils, the solum is terminated by the limestone. Almost all of the bedrock shows only small amounts of weathering.



Loess, the silty wind-deposited glacial parent material, is not distinguishable or is confined to the surface layer of glacial till soils.

Glacial till consists of the unstratified or slightly stratified, unassorted material deposited directly by glacial ice. Glacial till is on the terminal moraine of the glacier or as the ground moraine. The true moraine [illegible] Martinton soils, and silty clay, represented by Bryce soils and some Frankfort soils.

Alluvium is sand, silt, or clay that has been deposited on flood plains or bottom lands by flooding streams and rivers. Sawmill and Comfrey soils are the alluvial soils in Kankakee County.

Organic material is partly decomposed and [illegible]

Relief and drainage

In Kankakee County, relief influences the formation of soils through its effects on drainage. Slope influences the amount of runoff and, consequently, the degree of erosion and the amount of water that infiltrates through the profile. In areas where the soils formed in permeable parent material, such as fine sandy loam, the natural drainage is closely associated with slope. The well drained, moderately well drained, and excessively drained soils are in more rolling areas; the somewhat poorly drained, poorly drained, and very poorly drained soils are in nearly level or depressional areas. Kankakee County has a high percentage of nearly level soils. Soils that have slopes of more than 4 percent make up only about 6 percent of the area.

Time

The length of time necessary for a given soil to develop depends on the other factors of soil formation. Soils that formed in parent material low in calcium carbonate content develop more rapidly and become acid more readily than soils that formed in material high in calcium carbonate. Coarse textured soil material is leached of carbonates and other soluble minerals much faster than fine textured soil material. Soils develop faster under forest vegetation than under prairie vegetation because grasses are more efficient in leaching calcium and other bases from the subsoil to the surface layer. Soils generally develop faster in humid climates than in dry climates. Soils on a stable landscape generally become more strongly developed, or have greater horizon differentiation, with increased time of exposure to the weathering processes.

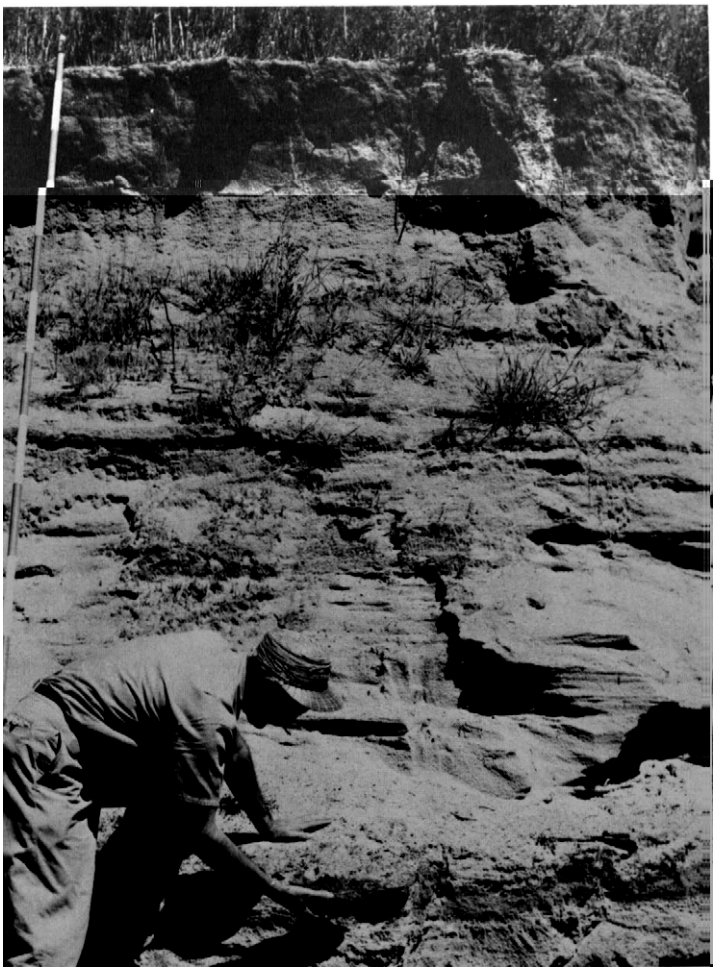


Figure 11.—A 12,500 to 22,000 year old buried soil below stratified sands in a Watseka soil area.

Geologically, the soils of Kankakee County are young. The soil materials were almost entirely deposited during the Woodfordian substage of the Wisconsin glacial stage. Radiocarbon dates have determined that this glacial period took place 22,000 to 12,500 years ago (*11*) (fig. 11).

Classification of Soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to the latest literature available (*7, 10, 12*).

The system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the bases for classification are the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis (*3, 8*). In table 15 the soils of the survey area are classified according to the system. Classes of the system are briefly discussed in the following paragraphs.

ORDER. Ten soil orders are recognized. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and that are important to plant growth or that were selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (Aqu, meaning water, plus oll, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. The name of a great group ends with the name of a suborder. A prefix added to the name suggests something about the properties of the soil. An example is Haplaquoll (*Hapl*, meaning simple horizons, plus *aquoll*, the suborder of Mollisolls that have an aquic moisture regime).

TABLE 15.—*Classification of the soils*

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ade	Coarse-loamy, mixed, mesic Psammentic Argiudolls
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
Andres	Fine-loamy, mixed, mesic Aquic Argiudolls
Ashkum	Fine, mixed, mesic Typic Haplaquolls
*Beardstown	Fine-loamy, mixed, mesic Udollic Ochraqualfs
Beecher	Fine, illitic, mesic Udollic Ochraqualfs
Bonfield	Loamy-skeletal, mixed, mesic Aquic Hapludolls
Bryce	Fine, mixed, mesic Typic Haplaquolls
Channahon	Loamy, mixed, mesic Lithic Argiudolls
Chelsea	Mixed, mesic Alfic Udipsamments
Comfrey	Fine-loamy, mixed, mesic Cumulic Haplaquolls
Darroch	Fine-loamy, mixed, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Faxon	Fine-loamy, mixed, mesic Typic Haplaquolls
Fieldon	Coarse-loamy, mixed (calcareous), mesic Typic Haplaquolls
Frankfort	Fine, illitic, mesic Udollic Ochraqualfs
Gilford	Coarse-loamy, mixed, mesic Typic Haplaquolls
Hoopeston	Coarse-loamy, mixed, mesic Aquic Hapludolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Kankakee	Loamy-skeletal, mixed, mesic Typic Hapludolls
Lena	Euic, mesic Typic Medisaprists
Markham	Fine, illitic, mesic Mollic Hapludalfs
Martinton	Fine, illitic, mesic Aquic Argiudolls
Maumee	Sandy, mixed, mesic Typic Haplaquolls
Milford	Fine, mixed, mesic Typic Haplaquolls
Mokena	Fine-loamy, mixed, mesic Aquic Argiudolls
Morley	Fine, illitic, mesic Typic Hapludalfs
Morocco	Mixed, mesic Aquic Udipsamments
Oakville	Mixed, mesic Typic Udipsamments
*Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plattville	Fine-loamy, mixed, mesic Typic Argiudolls
Reddick	Fine-loamy, mixed, mesic Typic Haplaquolls
Ritchey	Loamy, mixed, mesic Lithic Hapludalfs
Rockton	Fine-loamy, mixed, mesic Typic Argiudolls
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
Symerton	Fine-loamy, mixed, mesic Typic Argiudolls
Varna	Fine, illitic, mesic Typic Argiudolls
Watseka	Sandy, mixed, mesic Aquic Hapludolls
Whalan	Fine-loamy, mixed, mesic Typic Hapludalfs

SUBGROUP. Each great group is divided into three subgroups: the central (typic) concept of the great low plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is coarse-loamy, mixed, mesic, Typic Haplaquolls.

SERIES. The series consists of a group of soils that are formed from a particular kind of parent material and have horizons that, except for texture of the surface soil, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Literature Cited

(1) AMERICAN ASSOCIATION OF STATE HIGHWAY [AND TRANSPORTATION] OFFICIALS.
1970. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 10, 2 vol., illus.

(2) AMERICAN SOCIETY FOR TESTING AND MATERIALS.
1974. METHOD FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) BALDWIN, M., C. E. KELLOGG, AND J. THORP.
1938. SOIL CLASSIFICATION. U.S. Dep. Agri. Yearb. 1938: 978-1001, illus.

(4) HUFF, F. A. AND S. A. CHANGNON.
1959. HAIL CLIMATOLOGY OF ILLINOIS. Ill. State Water Surv. Rep. Invest. 38, 46 pp.

(5) ILLINOIS CONSERVATION COMMITTEE.
1970. ILLINOIS CONSERVATION NEEDS INVENTORY. Ill. Coop. Ext. Serv., 192 pp.

(6) JOOS, L. A.
1960. FREEZE PROBABILITIES IN ILLINOIS. Ill. Agric. Exp. Stn. in coop. US. Weather Bur., Bull. 650, 16 pp., illus.

(7) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Sci. 137: 1027-1034.

(8) THORP, JAMES AND GUY D. SMITH.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil. Sci. 67: 117-126.

(9) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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	More than 9

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or

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 for 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.

estimated. Frequency is expressed as non, rare, occasional, and frequent. None means that flooding is not probable; rare that it is unlikely but possible under unusual weather conditions; occasional that it occurs on an average of once

0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content

the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plants and animal life characteristics of the soil are largely confined to the solum.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining 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).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface soil. 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."

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 it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

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, silt loam, 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. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs.

Map symbol	Mapping unit	Page	Management group		Tree planting group
			Symbol	Page	Number
49	Watseka loamy fine sand	39	IIIw-1	44	2
69	Milford silty clay loam	27	IIw-2	43	4
88B	Sparta loamy fine sand, 1 to 5 percent slopes	37	IVs-1	45	6
89	Maumee loamy fine sand	26	IIIw-1	44	4
98B	Ade loamy fine sand, 1 to 5 percent slopes	9	IIIs-1	45	6
100	Palms muck	31	IIIw-2	44	7
107	Sawmill silty clay loam	35	IIw-1	42	5
125	Selma loam	36	IIw-1	42	4
R125	Selma loam, bedrock substratum	36	IIw-1	42	4
131B	Alvin fine sandy loam, 1 to 4 percent slopes	11	IIs-1	43	1
131C2	Alvin fine sandy loam, 4 to 10 percent slopes, eroded	11	IIIs-1	45	1
131F	Alvin fine sandy loam, 12 to 30 percent slopes	11	VIIs-1	46	1
146A	Elliott silt loam, 0 to 2 percent slopes	18	IIw-3	43	3
146B	Elliott silt loam, 2 to 4 percent slopes	18	IIe-2	42	3
150A	Onarga fine sandy loam, 0 to 2 percent slopes	31	IIs-1	43	1
150B	Onarga fine sandy loam, 2 to 4 percent slopes	31	IIs-1	43	1
172	Hoopeston fine sandy loam	22	IIs-2	43	2
188	Beardstown silt loam	13	IIs-2	43	2
189	Martinton silt loam	26	IIw-3	43	3
194B	Morley silt loam, 2 to 4 percent slopes	28	IIe-3	42	3
194C	Morley silt loam, 4 to 10 percent slopes	29	IIIe-1	44	3
194E2	Morley silt loam, 12 to 25 percent slopes, eroded	29	VIe-1	45	3
194C3	Morley soils, 5 to 12 percent slopes, severely eroded	29	IVe-1	45	3
201	Gilford fine sandy loam	21	IIIw-1	44	4
W201	Gilford fine sandy loam, wet	21	VIIw-1	46	5
210	Lena muck	24	IIIw-2	44	7
223B	Varna silt loam, 1 to 4 percent slopes	38	IIe-3	42	3
223C3	Varna soils, 4 to 7 percent slopes, severely eroded	38	IVe-1	45	3
232	Ashkum silty clay loam	12	IIw-2	43	4
235	Bryce silty clay	15	IIw-4	43	4
240A	Plattville silt loam, 0 to 2 percent slopes	32	I-1	41	1
240B	Plattville silt loam, 2 to 4 percent slopes	33	IIe-1	41	1
293	Andres silt loam	12	I-1	41	2
294A	Symerton silt loam, 0 to 2 percent slopes	37	I-1	41	1
294B	Symerton silt loam, 2 to 4 percent slopes	37	IIe-1	41	1
295	Mokena loam	28	IIw-3	43	3
298A	Beecher silt loam, 0 to 2 percent slopes	14	IIw-4	43	3
298B	Beecher silt loam, 2 to 4 percent slopes	14	IIe-2	42	3
311B	Ritchey silt loam, 2 to 6 percent slopes	34	IIIs-3	45	2
311D	Ritchey silt loam, 10 to 15 percent slopes	34	VIe-1	45	2
315A	Channahon silt loam, 0 to 2 percent slopes	16	IIIs-3	45	2
315B	Channahon silt loam, 2 to 4 percent slopes	16	IIIs-3	45	2
320A	Frankfort silt loam, 0 to 2 percent slopes	20	IIw-4	43	3
320B	Frankfort silt loam, 2 to 6 percent slopes	20	IIIe-1	44	3
330	Peotone silty clay loam	32	IIw-2	43	5

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Management group		Tree planting group
			Symbol	Page	Number
509A	Whalan loam, 0 to 2 percent slopes	39	IIs-3	44	2
509B	Whalan loam, 2 to 4 percent slopes	39	IIe-1	41	2
516	Faxon clay loam	19	IIIw-3	45	4
531B	Markham silt loam, 1 to 4 percent slopes	25	IIe-3	42	3
531C2	Markham silt loam, 4 to 7 percent slopes, eroded	25	IIIe-1	44	3
531C3	Markham soils, 4 to 7 percent slopes, severely eroded	25	IVe-1	45	3
594	Reddick clay loam	33	IIw-1	42	4
740	Darroch silt loam	18	IIw-3	43	2
741B	Oakville fine sand, 1 to 6 percent slopes	30	IVs-1	45	6
741D	Oakville fine sand, 7 to 18 percent slopes	30	VIIs-1	46	6
741F	Oakville fine sand, 18 to 40 percent slopes	30	VIIs-1	46	6
776	Comfrey soils	17	IIw-1	42	4
779B	Chelsea fine sand, 1 to 6 percent slopes	16	IVs-1	45	6

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.