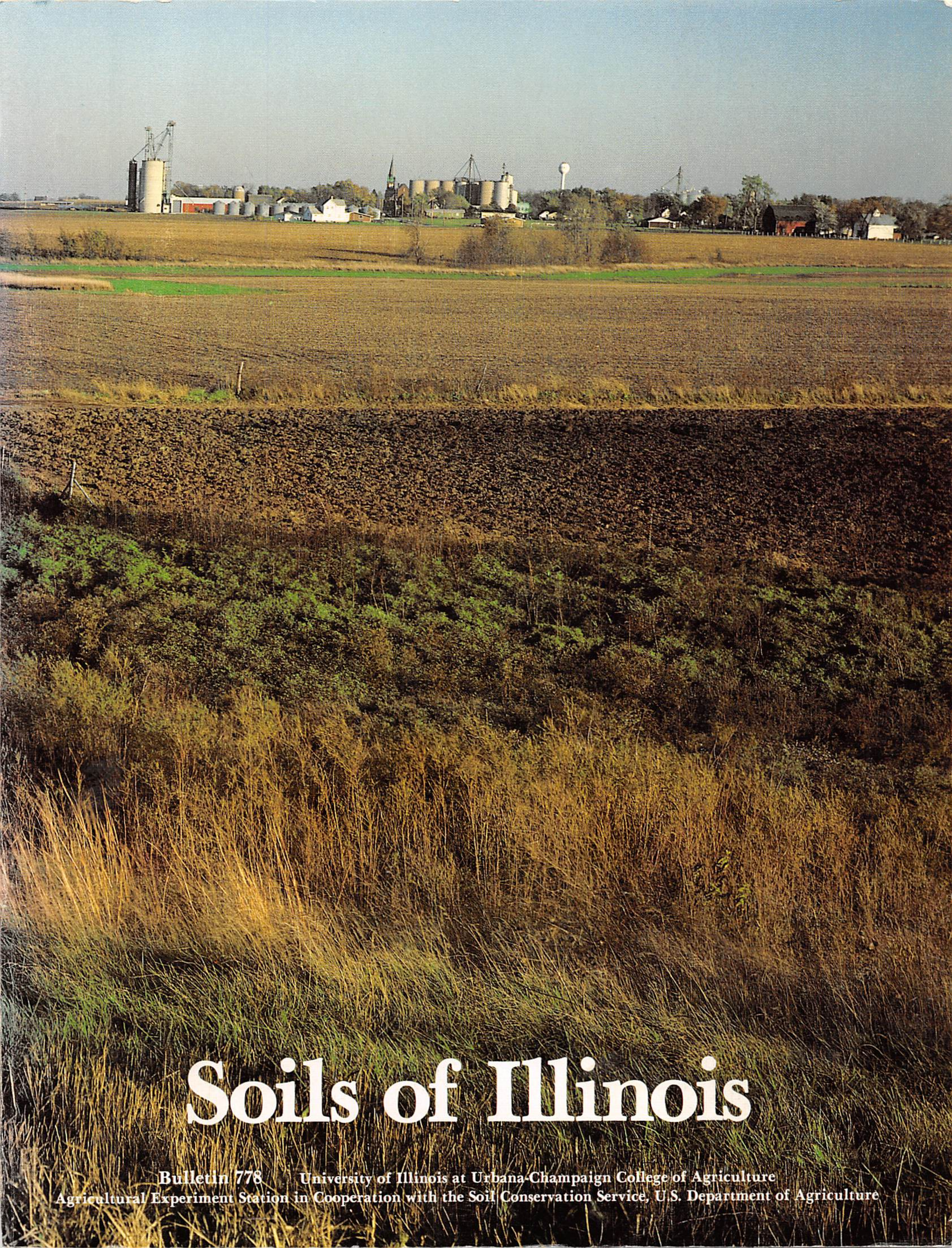

Soils of Illinois

Bulletin 778 University of Illinois at Urbana-Champaign College of Agriculture
Agricultural Experiment Station in Cooperation with the Soil Conservation Service, U.S. Department of Agriculture

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By
J.B. Fehrenbacher, J.D. Alexander,
I.J. Jansen, R.G. Darmody,
R.A. Pope, and M.A. Flock,
University of Illinois at Urbana-Champaign;
E.E. Voss, J.W. Scott,
W.F. Andrews, and L.J. Bushue,
Soil Conservation Service,
U.S. Department of Agriculture

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AUTHORS

Department of Agronomy, University of Illinois at Urbana-Champaign:

J. B. Fehrenbacher, Professor of Pedology Emeritus; J. D. Alexander and I. J. Jansen, Associate Professors of Pedology; R. G. Darmody, Assistant Professor of Pedology; R. A. Pope, formerly Assistant Professor of Soil Management; M. A. Flock, formerly Assistant Agronomist.

Soil Conservation Service, U.S. Department of Agriculture:

E. E. Voss, State Soil Scientist; J. W. Scott, Assistant State Soil Scientist; W. F. Andrews and L. J. Bushue, Soil Scientists.

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CONTENTS

Illinois soils vary in their properties and producing capacities. Large areas of the state have soils that are among the most productive in the world. Other areas have soils that, because they are too steep or drouthy or have some other undesirable features, are not productive for the commonly cultivated field crops. Often these less productive soils can be used to advantage for pasture, forage, and forest production, or for hunting or other recreational purposes. Many of the current problems with soils are the result of improper use and management. The solution to some of these problems lies in better fitting the uses of the soils to the characteristics and qualities of the soils.

To make the best use of the soils of Illinois, it is necessary to understand the nature and properties of the soils and to know how and where these soils occur in the state. This publication, which replaces Illinois Agricultural Experiment Station Bulletin 725, discusses the general properties, problems, and uses of Illinois soils and describes the response of crops grown on these soils to soil treatment. The accompanying General Soil Map of Illinois shows the location and extent of the soil associations of the state. The map has been greatly enlarged and produced in much more detail. The approximately 430 soils currently recognized in Illinois are now grouped in 50 soil associations rather than the 26 previously used. A new key to Illinois soils has been added, and the descriptions and tables of soil characteristics for each soil association have been revised.

This bulletin is intended to provide a broad picture of the soil resources and soil conditions in the state. It can be used for locating land that has desirable qualities for agricultural, urban, industrial, and engineering purposes, as well as for broad land-use planning and zoning. Farmers and farm managers, foresters, engineers, investors, land appraisers, zoning and planning commissioners, real estate dealers, subdividers, and home builders can use this information for their various needs. For many specific purposes, however, more detailed information, such as that given in county soil reports or gained from on-site studies, is needed after a general area has been studied and selected. (See page 74 for a list of the Illinois county soil reports available.)

A number of publications are available that contain specific information about the use of Illinois soils for various purposes. Drainage and irrigation guides for Illinois can be obtained from the Department of Agricultural Engineering, University of Illinois at Urbana-Champaign. Information on the use of soils for engineering, urbanization, septic tanks, recreation, woodland, and wildlife is available from the USDA Soil Conservation Service district offices and county Extension offices.

Soils are classified and mapped on the basis of a number of properties, including the kind, thickness, and arrangement of horizons or layers, and the color, texture, structure, reaction, consistency, and mineralogical and chemical composition of those horizons. Features such as slope, stoniness, degree of erosion, permeability, and total thickness of profile are also important in determining the use and crop adaption of soils. Any soil, however, will exhibit a range within the limits of these properties, and the boundaries between different kinds of soils in the field may or may not be sharp. Soils tend to form a continuum on the earth's surface, and one soil usually grades gradually to others. The boundaries or limits to the range of one kind of soil define that soil. These boundaries are not as distinct as those of individual plants or animals. It is no less important, however, that we define and classify soils on the basis of their properties so that we can remember their significant properties, organize our knowledge of them, show relationships among them and between them and their environment, and predict their response and behavior under various uses and management systems.

SOIL ASSOCIATIONS OF ILLINOIS

The soil associations shown on the General Soil Map of Illinois are composed of several related soil series or kinds of soils that developed from similar parent material and that have similar surface-soil color. The soil associations are named from two or more of their important soil series. The degree of development may vary somewhat among soils in an association. They also differ in properties related to the internal drainage or degree of wetness during their development. The range in drainage class, which includes "well," "moderately well," "somewhat poor," and "poor," is referred to in this publication as a *drainage sequence*. The soils in an association tend to occur in a characteristic pattern in the landscape that is often repeated. However, the proportion of the various soils changes from place to place, depending largely upon slope and natural drainage.

In the Key to Illinois Soils (pages 5 to 13) the major soils in the various associations are grouped on the basis of the parent materials from which they have formed, their surface-soil color, degree of development, and natural soil drainage. To find information on a particular soil, refer to the alphabetical or numerical lists of soils on pages 75 to 84. The alphabetical list includes the family and subgroup classification of each soil series (see pages 71 to 73 for a discussion of soil classification). Both lists give the numbers indicating the associations in which the soils occur. Some soils, particularly the minor ones, occur in more than one association. Soil parent materials, as well as the other factors in soil formation, are discussed on pages 66 to 71.

Surface-soil color is a reasonably accurate guide to the organic matter content of Illinois soils. In general, they are either dark-colored (developed under grass or prairie) or light-colored (developed under forest). The moderately dark-colored soils developed under mixed forest and grass, and are transitional between the two major surface-soil color classes. Moderately dark-colored soils are shown in the same soil association as the light-colored soils on the General Soil Map and in the Key to Illinois Soils. Two exceptions are associations 5 and 6, where the soils formed under grass but are strongly to very strongly developed and dark to moderately dark-colored. In association 56, dark, moderately dark, and light-colored soils are also shown in the same soil association on the soil map and in the Key to Illinois Soils because the areas of each are often small or narrow.

A soil's degree of development is the extent of weathering and change the parent materials have undergone in the formation of the soil. During formation, soils develop horizons or layers. In weakly developed soils, these horizons are not very distinct, but in strongly developed soils they are generally well differentiated in such properties as color, texture, and structure. The changes in appearance and physical properties associated with increasing degree of development are usually accompanied by chemical changes such as increased weathering of soil minerals, greater acidity, and lower plant-nutrient content. Among the dark-colored soils of the state, the flat, poorly drained soils with fine-textured surface horizons in each association are usually less developed than the related, better drained soils. The degree of development is usually best expressed in the somewhat poorly drained soil of a drainage sequence, probably because its water table and moisture regime fluctuate more than those of poorly drained or well-drained associated soils.

The nearly level, somewhat poorly and poorly drained major soils in soil associations 1 through 6 represent various degrees of development in what has become known as the *Illinois soil development sequence* (also known as the Illinois maturity sequence of soils). The soil series in this sequence and their degree of development within the range of Illinois soils are as follows: Joy, weak; Muscatine, moderate; Ipava, moderate-moderately strong; Herrick, moderately strong; Cowden, strong; Cisne, strong to very strong. Soils in this sequence formed under grass in loess, which thins systematically from the very thick deposits in association 1 (greater than 25 feet), through associations 2, 3, 4, 5, and finally, to association 6, to where it is only about 3 or 4 feet thick. The range in development from weak in association 1 to very strong in association 6 is due largely to the presence below the loess of a slowly or very slowly permeable paleosol, the Sangamon soil that formed in Illinoian-aged glacial drift. As the loess becomes thinner with increasing distance from its source, the depth of the relatively impermeable paleosol gradually decreases. Its presence at shallower and shallower depths created an increasingly wet environment in the overlying loess, promoting greater mineral weathering and a stronger degree of soil development.

The natural internal soil drainage class refers to the degree of wetness under which the soils formed, not to artificial drainage. The natural soil drainage classes may indicate whether drainage is needed but do not indicate drainability.

The approximate acreage and proportionate extent of each soil association in the state are listed on page 3. All acreages are rounded to the nearest 100 and all percentages to the nearest 1/10. The total land area, inland water area, and total state area are also listed. Total land area is the difference between the total acreage of the state and that of the inland water. Inland water includes lakes, reservoirs, and ponds of 40 acres or more and streams or sloughs ⅛ mile or more wide.

In the discussion of the soil associations that begins on page 14, soil horizons or layers are defined as follows. The upper horizon A is commonly called *surface soil.* The lower part of the A horizon is sometimes referred to as the *subsurface soil.* The B horizon, which is usually just below the A horizon, is often called *subsoil.* In most Illinois soils, the subsoil has the highest clay content of any horizon in the soil profile. The C horizon, often referred to as the *substratum,* is commonly thought of as soil parent material or underlying material. In soil profile descriptions, subdivisions of the three major horizons are defined and indicated by letter and number (A1, A2, B1, B2, B3, C1, etc.) as shown in Figure 1.

The descriptive terms for slope have the following gradients: nearly level, 0 to 2 percent; gently sloping, 2 to 5 percent; sloping, 5 to 10 percent; strongly sloping, 10 to 15 percent; moderately steep, 15 to 20 percent; steep, 20 to 30 percent; and very steep, more than 30 percent.

The discussion of each soil association is accompanied by a table giving the following information for each soil: slope range; thickness, texture, average percentage of organic matter in the plow layer, and lime group of the surface soil; thickness, texture, natural drainage class, permeability, and P (phosphorus) and K (potassium) supplying-power of the subsoil; texture and material of the substratum; available water to a depth of 60 inches for crops commonly grown in Illinois; erodibility factor; and grain crop productivity on 0- to 2-percent slopes at high and average levels of management.

Acreage and Percentage of Various Soil Associations in Land Area of Illinois

Soil association		Land area	
No.	Name	Acres	Percent of state
1	Port Byron-Joy	86,800	0.2
2	Tama-Muscatine-Sable	1,629,400	4.6
3	Tama-Ipava-Sable	3,043,300	8.5
4	Herrick-Virden-Piasa	1,052,700	2.9
5	Oconee-Cowden-Piasa	608,000	1.7
6	Hoyleton-Cisne-Huey	1,508,600	4.2
7	Winnebago-Durand-Ogle	83,200	0.2
8	Broadwell-Waukegan-Pillot	166,500	0.5
9	Catlin-Flanagan-Drummer	2,104,600	5.9
10	Wenona-Rutland-Streator	134,400	0.4
11	Plano-Proctor-Worthen	1,859,300	5.2
12	Saybrook-Dana-Drummer	1,228,800	3.4
13	Griswold-Ringwood	97,100	0.3
14	Varna-Elliott-Ashkum	983,100	2.7
15	Symerton-Andres-Reddick	175,200	0.5
16	Swygert-Bryce-Mokena	528,400	1.5
17	Clarence-Rowe	116,200	0.3
18	Harco-Patton-Montgomery	111,000	0.3
19	Martinton-Milford	338,600	1.0
20	Lorenzo-Warsaw-Wea	237,500	0.7
21	Jasper-LaHogue-Selma	443,700	1.2
22	Sparta-Dickinson-Onarga	761,000	2.1
23	Channahon-Dodgeville-Ashdale	197,100	0.6
24	Lawson-Sawmill-Darwin	2,326,100	6.5
25	Houghton-Palms-Muskego	75,800	0.2
31	Seaton-Timula	209,400	0.6
32	Fayette-Rozetta-Stronghurst	2,252,800	6.3
33	Alford-Muren-Iva	356,200	1.0
34	Clinton-Keomah-Rushville	2,804,600	7.9
35	Hosmer-Stoy-Weir	1,221,400	3.4
36	Ava-Bluford-Wynoose	2,387,500	6.7
37	Westville-Pecatonica-Flagg	127,900	0.4
38	Middletown-Tell-Thebes	90,400	0.3
39	Birkbeck-Sabina-Sunbury	454,300	1.3
41	St. Charles-Camden-Drury	371,500	1.0
42	Dodge-Russell-Miami	381,000	1.1
43	Kidder-McHenry	65,800	0.2
44	Morley-Blount-Beecher	642,200	1.8
45	St. Clair-Nappanee-Frankfort	149,200	0.4
46	Markland-Colp-Del Rey	298,900	0.8
48	Casco-Fox-Ockley	163,400	0.5
49	Martinsville-Sciotoville	101,300	0.3
50	Oakville-Lamont-Alvin	467,700	1.3
51	Ritchey-New Glarus-Palsgrove	205,700	0.6
52	Alford-Goss-Baxter	188,100	0.5
53	Alford-Wellston	116,400	0.3
54	Hosmer-Zanesville-Berks	489,800	1.4
55	Grantsburg-Zanesville-Wellston	388,000	1.1
56	Derinda-Schapville-Eleroy	89,100	0.3
57	Haymond-Petrolia-Karnak	1,738,700	4.9
Total land area		35,657,700	100.0
Total inland water area		438,300	
Total area of Illinois		36,096,000	

Although the meaning of most of the soil characteristics listed in the tables is apparent, some characteristics require explanation. In the surface soil, a thick, black (high in organic matter) silt loam or loam is most desirable. This surface soil is lime group B. Lime groups are based on the soils' texture and organic matter content. The texture described in the tables is the principal texture occurring in Illinois.

Permeability is the integrated permeability of the entire subsoil, and does not necessarily apply to individual subhorizons. Moderate permeability is considered the most desirable. Since water flow is restricted in soils having slow or very slow permeability, tile are usually not recommended in those needing drainage. Soils with rapid or very rapid permeability, such as sandy soils, do not hold much water even at field capacity. If the soils are wet because of their low-lying position, drainage may cause drouth problems if the water table is lowered too much.

The P and K supplying-power of the subsoil indicates the amount of these nutrients that plants can use once their roots penetrate that layer. Available water to 60 inches reflects the soil's water-storage capacity. If a root-restricting layer such as a fragipan is present, the available water is reduced. The erodibility factor indicates the ease with which soil particles are detached by rainfall.

Productivity indexes and crop yield estimates are contained in Illinois Cooperative Extension Service Circular 1156, *Soil Productivity in Illinois*. Only the high and average productivity indexes are given here. Crop adaptation is related to climate and soil characteristics. Maps showing the average annual temperature and precipitation and the average number of frost-free days in Illinois are on pages 69 and 70. Most of the common field crops can be grown in all areas of the state. Spring oats are best adapted to northern Illinois. Production of cotton, very little of which is grown in Illinois, is restricted to the extreme southern end of the state. Tree fruits such as apples and peaches are best adapted to the southern one-half of the state. Forests are more extensive in southern than in northern Illinois, but more as a result of topography, soils, and native vegetation than of climate. Most corn is grown in central and northern Illinois. Most soybeans and wheat are grown in the southern two-thirds of the state, and acreages of oats and hay are highest in the northern one-third. Crop production management is discussed in the *Illinois Agronomy Handbook*.

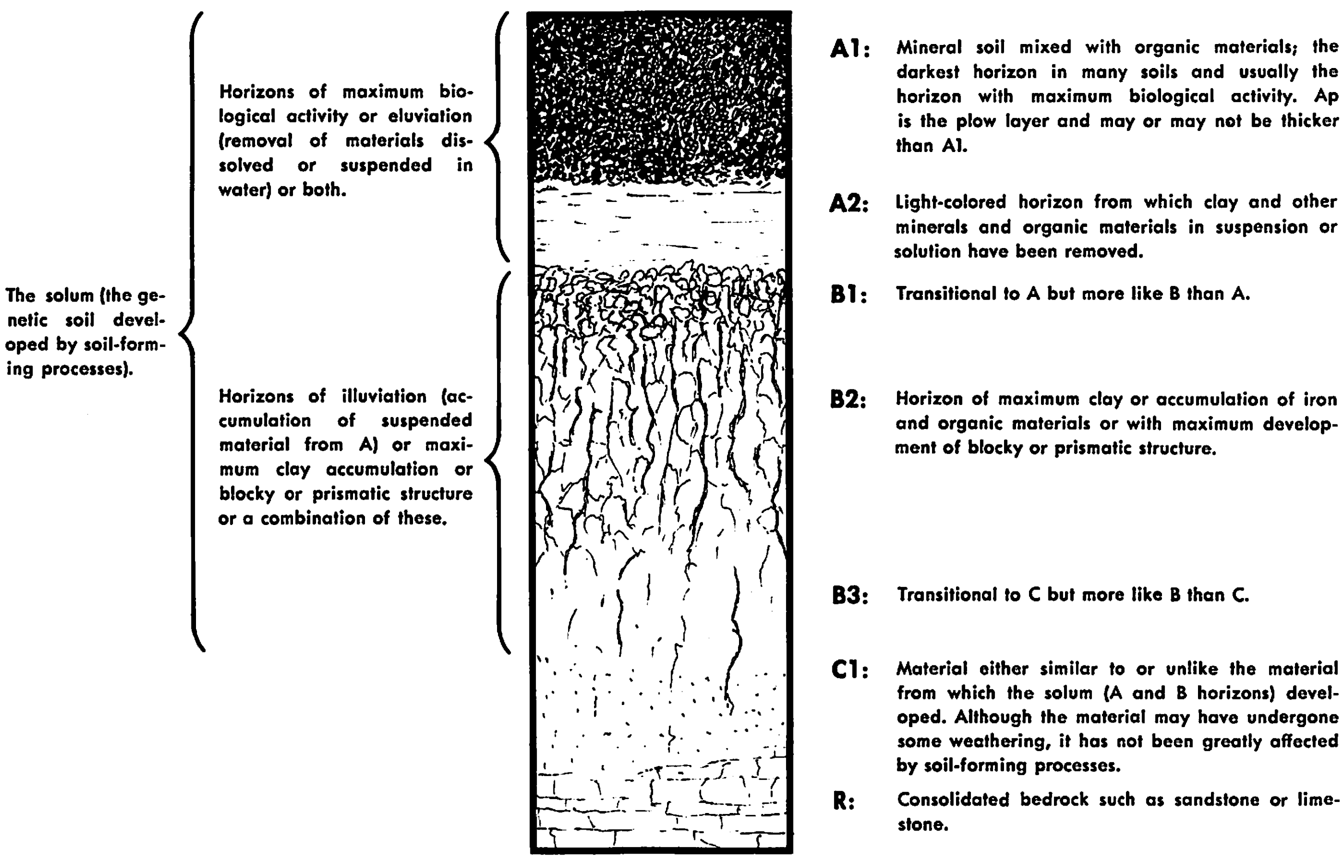

Figure 1. Principal horizons of upland soils. Not every horizon and subhorizon shown here is necessarily present in all soils. (Adapted from *Nomenclature of Soil Horizons,* USDA Handbook 18, pages 174-183. 1951.)

Key to Illinois Soils

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
I. THICK LOESS (> 60 in.)[a]								
Loess > 60 in. thick, calcareous at > 42 in. (> 25 ft. thick)	1	Dark	Weak	——Port Byron 277[b]——		Joy 275		1
				——Port Byron, san. sub. 562				2
	31	Moderately dark	Weak	——Mt. Carroll 268——				3
		Light	Weak	——Seaton 274——				4
				——Seaton, san. sub. 563——				5
Loess > 60 in. thick, calcareous at < 36 in. (> 20 ft. thick)	1, 2, 3	Dark	Very weak	——Tallula 34——				6
	31	Light	Very weak	——Timula 271——				7
Loess > 60 in. thick, calcareous at > 42 in. (10-25 ft. thick)	2	Dark	Moderate	——Tama 36——		Muscatine 41	Sable 68	8
	1, 2		Mod. B., thick A2				Edgington 272	9
	2,3	Dark	Weak B, calc.				Harpster 67	10
		Moderately dark	Str. B, mod. A2				Denny 45	11
	32	Moderately dark	Moderate	——Downs 386——		Atterberry 61		12
		Light	Moderate	Fayette 280	Rozetta 279	Stronghurst 278	Traer 633	13
Loess > 60 in. thick, calcareous at < 42 in. (10-25 ft. thick)	31, 32, 33	Light	Moderate	Sylvan 19	Iona 307	Reesville 723	Whitson 116	14
Loess > 60 in. thick, calcareous throughout	31, 32, 33	Light	None, < 12% clay	Hamburg 30				15
			None, 12-18% clay	Bold 35				16
Loess > 60 in. thick, calcareous at > 42 in. (5- > 20 ft. thick)	33, 52, 53	Light	Moderate	Alford 308	Muren 453	Iva 454		17
Loess > 60 in. thick, calcareous at > 42 in. (15- > 20 ft. thick)	3	Dark	Mod.-mod. str.	——Tama 36——		Ipava 43	Sable 68	18
			Mod. B, weak A2				Edinburg 249	19
Loess > 60 in. thick, calcareous at < 42 in. (5- > 20 ft. thick)	3	Dark	Moderate	——Elkhart 567——			Hartsburg 244	20
Loess > 60 in. thick, calcareous at > 42 in. (5- > 20 ft. thick)	34	Moderately dark	Mod.-mod. str.	——Downs 386——		Clarksdale 257		21
		Light	Mod. str.	——Clinton 18——		Keomah 17	Rushville 16	22
Loess > 60 in. thick, leached (5-7 ft. thick)	4	Dark	Mod. str.	——Tama 36——		Herrick 46	Virden 50	23
			Weak				Harvel 252	24
	34	Moderately dark	Mod.-mod. str.	——Downs 386——		Clarksdale 257		25
		Light	Mod. str.	——Clinton 18——		Keomah 17	Rushville 16	26
II. MODERATELY THICK TO THIN LOESS (10-60± in.) ON ILLINOIAN DRIFT WITH OR WITHOUT PALEOSOLS								
Loess 50-70 in. thick on gray paleosols in Illinoian drift	5	Dark-mod. dark	Strong			Oconee 113	Cowden 112	27
	35, 54	Light	Strong	Wartace 215	Hosmer 214	Stoy 164	Weir 165	28
Loess 30-55 in. thick on gray paleosols in Illinoian till or local wash	6	Dark-mod. dark	Str.-very str.		Richview 4	Hoyleton 3	Cisne 2	29
		Dark	Str. B, thick A			Lukin 167	Chauncey 287	30
			Moderate				Ebbert 48	31
		Dark-mod. dark	Moderate				Newberry 218	32
	36	Light	Str.-very str.		Ava 14	Bluford 13	Wynoose 12	33
			Str. B, thick A			Creal 337	Racoon 109	34
Loess 30-70 in. thick on gray paleosols in Illinoian till	4, 5, 6	Dark	High sodium B				Piasa 474	35
		Light	High sodium B		Tamalco 581	Darmstadt 620	Huey 120	36
Loess < 20 in. thick on gray paleosols in Illinoian till	4, 5, 6	Light	High sodium B		Walshville 584			37

[a] For abbreviations and symbols, see end of Key on page 13.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Loess < 20 in. thick on Illinoian loam till[a]	3, 4, 5, 6	Dark	Moderate	——Velma 250[b]——				38
	31, 32, 33, 34, 35, 36	Light	Moderate	——Hickory 8——		Blair 5		39
Loess < 20 in. thick on thick, gray paleosols	4, 5, 6	Dark	Strong				Coatsburg 660	40
	32, 33, 34, 35, 36	Light	Strong		Ursa 605	Atlas 7		41
Loess and loamy material 12-36 in. thick on gray paleosols	11	Dark	Moderate		Prairieville 650	Nachusa 649		42
Loess 20-40 in. thick on thick, gray and brownish paleosols	2, 3, 4	Dark	Strong			Keller 470		43
	32, 34	Light.	Strong			Fishhook 6		44
	2, 3, 4	Dark	Moderate	——Assumption 259——				45
	32, 33, 34	Light	Moderate	——Elco 119——				46
Loess < 20 in. thick on thick, acid, gravelly and sandy, reddish paleosols	4, 5, 6	Dark	Moderate	Pana 256				47
	33, 34, 35, 36	Light	Moderate	Negley 585				48
Loess 20-40 in. thick on acid, thick, reddish paleosols	33, 34, 35, 36	Light	Moderate	Parke 15				49
Loess 40-60 in. thick on acid, thick, reddish or grayish paleosols	4, 5	Dark	Moderate	Douglas 128	Harrison 127			50
	33, 34, 35	Light	Moderate	Pike 583				51
Loess < 15 in. thick on thick, reddish paleosols	7	Dark	Moderate	——Winnebago 728——				52
	37	Light	Moderate	——Westville 22——				53
Loess 15-30 in. thick on thick, reddish paleosols	7	Dark	Moderate	——Durand 416——				54
	37	Moderately dark	Moderate	——Argyle 227——				55
		Light	Moderate	——Pecatonica 21——				56
Loess 30-50 in. thick on thick, reddish paleosols	7	Dark	Moderate	Ogle 412				57
			Moderate	Ogle, sil. sub. 574				58
	37	Moderately dark	Moderate	Myrtle 414				59
		Light	Moderate	Flagg 419				60
III. MODERATELY THICK TO THIN LOESS (20-60 in.) ON AEOLIAN, WISCONSINAN LOAMY SANDS OR SANDS								
Loess 40-60 in. thick on loamy sand or sand	8	Dark	Moderate	——Broadwell 684——		Lawndale 683		61
	38	Light	Moderate	——Middletown 685——				62
Loess or silty material 20-40 in. thick on loamy sand or sand	8	Dark	Weak	Waukegan 564				63
	38	Light	Weak	Tell 565				64
	8	Dark	Moderate	Pillot 159				65
	38	Light	Moderate	——Thebes 212——				66
IV. MODERATELY THICK LOESS (40-60 in.) ON MEDIUM- TO FINE-TEXTURED, WISCONSINAN TILL OR LACUSTRINE SEDIMENTS								
Loess 40-60 in. thick on calcareous loam or silty clay loam till or silty clay loam lacustrine material	9	Dark	Mod.-mod. str.	——Catlin 171——		Flanagan 154	Drummer 152	67
	39	Moderately dark	Mod. str.			Sunbury 234		68
		Light	Mod. str.	——Birkbeck 233——		Sabina 236		69
Loess 40-60 in. thick on calcareous silty clay or clay till or lacustrine material	10	Dark	Mod. str.	——Wenona 388——		Rutland 375	Streator 435	70
	45	Light	Mod. str.			Kernan 554		71

[a] For abbreviations and symbols, see end of Key on page 13.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
V. MODERATELY THICK TO THIN LOESS OR SILTY MATERIAL (24-60+ in.) ON MEDIUM-TEXTURED, WISCONSINAN OUTWASH								
Loess 40-60 in. thick on medium-textured outwash or sandy loam till	11	Dark	Moderate	——Plano 199——		Elburn 198	Drummer 152	72
	41	Moderately dark	Moderate	——Batavia 105——		Virgil 104		73
		Light	Moderate	——St. Charles 243——		Kendall 242		74
Loess 40-60 in. thick on medium-textured outwash or sandy loam till	11, 9	Dark	Weak B, calc.				Harpster 67	75
	11	Dark	Weak B, calc.				Canisteo 347	76
			Weak B, calc.				Lemond 196	77
Loess or silty material 24-60 in. thick on medium-textured outwash or sandy loam till	11	Dark to 24-36 in.	Moderate	——Troxel 197[b]——				78
		Dark	Mod. B, mod. A2				Thorp 206	79
		Moderately dark	Str. B, str. A2				Brooklyn 136	80
		Dark, thick A	Mod. B, mod. A2				Knight 191	81
Loess or silty material 24-40 in. thick on medium-textured outwash, calcareous at > 40 in.[a]	11	Dark	Moderate	——Proctor 148——		Brenton 149	Drummer 152	82
	41	Moderately dark	Moderate	——Harvard 344——		Millbrook 219		83
		Light	Moderate	——Camden 134——		Starks 132	Sexton 208	84
Loess or silty material 24-40 in. thick on medium-textured outwash, calcareous at < 40 in.	11	Dark	Moderate	——Barrington 443——		Mundelein 442	Pella 153	85
	41	Moderately dark	Moderate	——Grays 698——		Wauconda 697		86
		Light	Moderate	——Zurich 696——		Aptakisic 365		87
Loess or silty material 30-50 in. thick on loamy material on sand and gravel, calcareous at > 50 in.	11	Dark	Moderate	——Waupecan 369——				88
	41	Moderately dark	Moderate	——Bowes 792——				89
		Light	Moderate	Rush 791				90
Silty colluvial sediments > 60 in. thick	11	Dark to > 24 in.	Weak	——Worthen 37——		Littleton 81		91
		Dark to 10-24 in.	Weak	——Raddle 430——		Coffeen 428		92
	41	Light	Weak	——Drury 75——				93
VI. THIN LOESS (10-40 in.) ON LOAM OR SANDY LOAM, WISCONSINAN TILL								
Loess or silty material 20-40 in. thick on loam till, calcareous at < 42 in.	12	Dark	Moderate	——Saybrook 145——		Lisbon 59	Drummer 152	94
	42	Moderately dark	Moderate			Herbert 62		95
		Light	Moderate	Dodge 24				96
Loess or silty material 20-40 in. thick on loam till, calcareous at > 42 in.	12	Dark	Moderate	Sidell 55	Dana 56	Raub 481	Drummer 152	97
	42	Moderately dark	Moderate	Mellott 497	Wingate 348	Toronto 353		98
		Light	Moderate	Russell 322	Xenia 291	Fincastle 496		99
Loess or silty material < 15 in. thick on loam till, calcareous at < 42 in.	12	Dark	Moderate	Parr 221	Corwin 495	Odell 490	Pella 153	100
	42	Moderately dark	Moderate	Octagon 656	Montmorenci 57			101
		Light	Moderate	Miami 27				102
Loess < 10 in. thick on loam till, calcareous at < 24 in.	12, 13	Dark	Moderate	——La Rose 60——				103
	42, 43	Light	Moderate	——Strawn 224——				104
Loam till, calcareous at < 10 in.	39, 42, 43	Light	Weak	Hennepin 25				105
Sandy material 20-40 in. thick on calcareous loam till	12, 13	Dark	Moderate	Ayr 204				106
	42, 43	Light	Moderate	Metea 205				107

[a] For abbreviations and symbols, see end of Key on page 13.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Loess or silty material < 15 in. thick on calcareous sandy loam till	13	Dark	Moderate	Griswold 363				108
	43	Light	Moderate	Kidder 361				109
Loess or silty material 15-30 in. thick on calcareous sandy loam till	13	Dark	Moderate	——Ringwood 297——				110
	43	Light	Moderate	——McHenry 310——				111
VII. THIN LOESS (< 20 in.) ON SILTY CLAY LOAM, WISCONSINAN TILL OR LACUSTRINE SEDIMENTS								
Loess or silty material < 20 in. thick on silty clay loam till, calcareous at < 42 in.	14	Dark	Moderate	——Varna 223——		Elliott 146	Ashkum 232	112
	44	Moderately dark	Moderate	——Markham 531——		Beecher 298		113
		Light	Moderate	——Morley 194——		Blount 23		114
Silty clay loam local wash in depressions	14, 9	Dark to 24-36 in.	Weak				Peotone 330	115
Loess and lo. mat. 30-50 in. thick on calc. sicl. till or lac. mat.[a]	15	Dark	Moderate	——Symerton 294[b]——		Andres 293	Reddick 594	116
Sandy mat. 20-40. in. thick on sicl. or cl. lac. mat. or till	14, 15, 19	Dark	Weak			Wesley 141		117
VIII. THIN LOESS (< 20 in.) ON SILTY CLAY OR CLAY, WISCONSINAN TILL OR LACUSTRINE SEDIMENTS								
Loess or silty material < 20 in. thick on calcareous silty clay till or lacustrine material	16	Dark	Mod. str.			Swygert 91	Bryce 235	118
	45	Moderately dark	Mod. str.			Frankfort 320		119
		Light	Mod. str.	——St. Clair 560——		Nappanee 228		120
Loess or silty material < 20 in. thick on calcareous silty clay or clay till or lacustrine material	16, 17	Dark	Str. B, mod. A2				Monee 229	121
		Dark to 24-36 in.	Moderate				Rantoul 238	122
Heavy sicl., sic., or c. till or lac. mat., calc. at < 10 in.	44, 45	Light	Weak		Chatsworth 241			123
Loess or silty material < 20 in. thick on calcareous clay till or lacustrine mat.	17	Dark	Mod. str.			Clarence 147	Rowe 230	124
	45	Moderately dark	Mod. str.			Frankfort 320		125
		Light	Mod. str.	——St. Clair 560——		Nappanee 228		126
Loess and lo. mat. 30-50 in. thick on calc. sic. or c. till or lac. mat.	16, 17	Dark	Moderate	——Mona 448——		Mokena 295	Reddick 594	127
Lo. mat. 20-40 in. thick on sic. or c. lac. mat. or till	16, 17	Dark	Moderate			Papineau 42		128
IX. LOAMY, SILTY, AND CLAYEY, WISCONSINAN LACUSTRINE SEDIMENTS								
San. mat. 30-50 in. thick on red lo. mat., s. and g. at 50+ in.	11, 19	Dark	Moderate	——Coyne 764——				129
Loamy material 40-60 in. thick on reddish silty clay or clay	11, 19	Dark	Moderate	Joslin 763				130
Silty material 30-40 in. thick on stratified silt loam and silty clay loam material, calcareous at < 42 in.	18	Dark	Moderate			Harco 484	Patton 142	131
	46	Moderately dark	Moderate			Marissa 176		132
		Light	Moderate	——Uniontown 482——		Reesville 723		133
Medium-textured material < 20 in. thick on silty clay loam material on stratified, medium-textured material, calcareous at < 48 in.	19	Dark	Moderate			Martinton 189	Milford 69	134
	46	Light	Moderate	——Saylesville 370——		Del Rey 192		135
Medium-textured material < 20 in. thick on silty clay or clay, calcareous at < 42 in.	18, 19	Dark	Moderate				Montgomery 465	136
	46	Light	Moderate	——Markland 467——		McGary 173	Zipp 524	137
Medium-textured material < 20 in. thick on reddish silty clay or clay on loamy sand or sand, calcareous at > 42 in.	19	Dark	Moderate			Denrock 262		138
	46	Moderately dark	Moderate				Niota 261	139
		Moderately dark	Moderate				Niota, thin A 568	140
		Light	Moderate				Zwingle 576	141
Medium-textured material < 20 in. thick on grayish silty clay or clay, calcareous at > 42 in.	46	Moderately dark	Mod. str.				Wagner 26	142
		Light	Mod. str.		Colp 122	Hurst 338	Okaw 84	143

[a] For abbreviations and symbols, see end of Key on page 13.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Calcareous silty clay or clay	19	Dark	Moderate				Aholt 670	144
Medium acid to moderately alkaline silty clay or clay	19, 24	Dark	Mod. str.				Booker 457	145
X. THIN LOAMY OR SILTY MATERIALS ON GRAVELLY, WISCONSINAN OUTWASH								
Neutral to calc. gl. l. or sl. < 15 in. thick on calc. g.	20	Dark	Weak	Rodman 93				146
Loamy material < 18 in. thick on gravelly, sandy material	20	Dark	Weak	Stockland 155				147
	48	Light	Weak	Stonington 253				148
Sandy material 10-20 in. thick on leached sand and gravel	20	Dark	Weak	Burkhardt 961				149
Loamy sand 20-40 in. thick on calcareous sand and gravel	20	Dark	V. weak or no B	Hononegah 354				150
Lo. mat. 18-30 in. thick on leached ls. and on s. and gravel	20	Dark	Weak	Saude 774				151
San. mat. 24-40 in. thick on leached ls. and on s. and gravel	20	Dark	Weak	Flagler 783				152
Lo. mat. 20-40 in. thick on leached, gl. lo. mat. on g. and s.	20	Dark	Weak	Carmi 286		Omaha 289	Westland 300	153
Loamy material 12-24 in. thick on gravel and sand, calcareous by 24 in.	20	Dark	Moderate	Lorenzo 318				154
	48	Light	Moderate	Casco 323				155
Loamy material 20-40 in. thick on gravel and sand, calcareous at 24-40 in.	20	Dark	Moderate	Warsaw 290		Kane 343	Will 329	156
	48	Moderately dark	Moderate	Dresden 325		Matherton 342		157
		Light	Moderate	Fox 327		Homer 326		158
Loamy material 24-40 in. thick on leached, gravelly loamy sand and sand	20	Dark	Moderate	Dakota 379				159
	48	Moderately dark	Moderate	Dowagiac 346				160
		Light	Moderate	Ellison 137				161
Loamy material 30-40 in. thick on sand and gravel, leached at > 48 in.[a]	20	Dark	Weak	Waukee 727		Lawler 647	Marshan 772	162
	48	Moderately dark	Weak	——Hayfield 771[b]——				163
Sandy material 20-40 in. thick on calcareous sand and gravel at < 40 in.	20	Dark	Weak (calc.)				Fieldon 380	164
	48	Light	Weak	Boyer 706				165
Loess or silty material < 20 in. thick on loamy material on calcareous sand and gravel at 40-60 in.	20	Dark	Moderate	Wea 398		Crane 609	Westland 300	166
	48	Moderately dark	Moderate	Longlois 394				167
		Light	Moderate	Ockley 387				168
XI. THIN SILTY OR LOAMY MATERIALS ON SANDY AND LOAMY, WISCONSINAN OUTWASH								
Reddish lo. mat. 20-40 in. thick on ls. and s., leached at > 48 in.	21	Dark	Moderate	Trempealeau 765				169
Loamy material 20-40 in. thick on silty material 15-30 in. thick on sandy loam	21	Dark	Moderate	——Friesland 781——				170
	49	Light	Moderate	——Grellton 780——				171
Loess or silty material < 20 in. thick on loamy material on calcareous, medium-textured outwash, calcareous at > 40 in.	21	Dark	Moderate	Jasper 440		Darroch 740	Selma 125	172
	49	Light	Moderate	Martinsville 570		Whitaker 571		173
Sandy loam 20-40 in. thick on leached loamy sand or sand	21	Moderately dark	Moderate				Orio 200	174
Loam and sandy loam 40-60 in. thick on leached loamy sand, sand, and some gravel	21	Dark	Moderate			LaHogue 102		175
		Moderately dark	Mod. str.			Beardstown 188	Milroy 187	176
Sit. and lo. mat. 30-50 in. thick on stra., micaceous sil., sl., s., and g.	49	Light	Mod. str.	Wheeling 463	Sciotoville 462	Weinbach 461	Ginat 460	177
Acid silty clay loam material > 50 in. thick	49	Light	Weak		Emma 469			178

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Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
XII. THICK SANDY, WISCONSINAN OUTWASH AND AEOLIAN MATERIALS								
Fine sand or loamy fine sand, calcareous at < 15 in.	50	Light	None	Chute 282				179
Sand, fine sand, loamy sand, or loamy fine sand > 60 in. thick, < 50% fine and very fine sand	22	Dark	V. W. or no B to 60 in.	Sparta 88		Watseka 49	Granby 513	180
	50	Light	V. W. or no B to 60 in.	Plainfield 54		Morocco 501		181
Fine sand, sand, or loamy fine sand > 60 in. thick, 50-90% fine sand	22	Dark at 14-24 in.	V. W. or no B to 60 in.				Maumee 89	182
	50	Light	V. W. or no B to 60 in.	Oakville 741				183
			V. W. B, 40-60 in.	Chelsea 779				184
	22	Dark	W. B, 40-60 in.	Ade 98				185
	50	Light	W. B, 40-60 in.	Bloomfield 53				186
Sandy loam or fine sandy loam 20-40 in. thick on leached sand, loamy sand, fine sand, and loamy fine sand	22	Dark	W. B, 15-30 in.	Dickinson 87		Hoopeston 172	Gilford 201	187
			W. B, 15-30 in.	Dickinson, l. sub. 742				188
	50	Moderately dark	W. B, 15-30 in.	Billett 332				189
		Light	W. B, 15-30 in.	Lamont 175				190
	22	Dark	Mod. B, 15-30 in.	——Onarga 150——		Ridgeville 151		191
			Mod. B, 15-30 in.	——Onarga, red. subs. 673—				192
	50	Light	Mod. B, 15-30 in.	——Alvin 131——		Roby 184	Ruark 178	193
			Mod. B, 15-30 in.	——Alvin, thick A V131——				194
L., el., and sl. 40-50 in. thick on leached ls. and s.[a]	22	Dark to > 24 in.	Weak	Lomax 265				195
Sandy loam 20-40 in. thick on leached loamy sand and sand	22	Dark to > 24 in.	Weak	Disco 266				196
Sl. or fsl. (Cretaceous) 20-40 in. thick on leached s., ls., and sl.	34	Light	Moderate	——El Dara 264[b]——				197
XIII. THIN TO THICK LOESS OR LOAMY MATERIALS WITH OR WITHOUT RESIDUUM ON LIMESTONE								
Loamy material < 10 in. thick on limestone, no residuum	23	Dark	None				Romeo 316	198
Loamy material 10-20 in. thick on limestone, no residuum	23	Dark	Weak-moderate	——Channahon 315——			Joliet 314	199
	51	Light	Weak-moderate	Ritchey 311				200
Silty or loamy material or loamy residuum < 20 in. thick on limestone	23	Dark	Very weak-none	Sogn 504				201
Loess < 20 in. thick on < 10 in. residuum on limestone by 20 in.	23	Dark	Moderate	Edmund 769				202
	51	Light	Moderate	Dunbarton 505				203
			Moderate	Dunbarton, chr. 511				204
Loess 10-25 in. thick on 25-40 in. loamy drift on < 10 in. residuum on limestone at 40-60 in.	23	Dark	Moderate	Hitt 506				205
	51	Moderately dark	Moderate	——Oneco 752——				206
		Light	Moderate	Woodbine 410				207
Loess 15-30 in. thick on 10-20 in. residuum on limestone at 20-40 in.	23	Dark	Moderate	Dodgeville 40				208
	51	Light	Moderate	New Glarus 928				209
Loess 20-36 in. thick on < 10 in. till on < 6 in. resi., lims. at < 40 in.	23	Dark	Moderate	Ripon 324				210
Loess 18-36 in. thick on limestone at 20-40 in., on < 6 in. residuum	51	Light	Moderate	Dubuque 29				211

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[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Loess 36-50 in. thick on < 10 in. residuum on limestone at 40-60 in.	23	Dark	Moderate	Ashdale 411				212
	51	Moderately dark	Moderate	Nassett 731				213
		Light	Moderate	Palsgrove 429				214
Lo. ow. 15-35 in. thick on very cb. lo. mat., lims. at 60+ in., no resi.	23	Dark	Moderate	——Kankakee 494——		Bonfield 493		215
San. mat. 20-40 in. thick on < 10 in. resi. on lims. at 20-40 in.	51	Moderately dark	Moderate	Backbone 768				216
Loamy drift 20-40 in. thick on < 10 in. residuum, limestone at 20-40 in.	23	Dark	Moderate	Rockton 503			Millsdale 317	217
	51	Light	Moderate	Whalan 509				218
Loamy alluvium or drift 20-40 in. thick on limestone, no residuum	23	Dark	Weak				Faxon 516	219
Lo. till or ow. 36-45 in. thick on < 10 in. resi., lims. at 40-55 in.	23	Dark	Moderate	Atkinson 661				220
Loamy glacial drift 40-60 in. thick on limestone, no residuum	23	Dark	Moderate	——Plattville 240——			Selma, br. sub. 508	221
Loess < 10 in. thick on thick, very cherty residuum, limestone at 60+ in.	52	Light	Moderate	Clarksville 471				222
			Moderate	Bodine 471				223
Loess < 10 in. thick on thick, chr., clayey, acid resi., lims. at 60+ in.	52	Light	Strong	Baxter 599				224
Loess < 10 in. thick on thick, very chr., clayey resi., lims. at 60+ in.	52	Light	Strong	Goss 606				225
Loess 20-40 in. thick on thick, chr. resi. on lims. at > 60 in.	52	Light	Moderate	Baylis 472				226
Loess 20-40 in. thick on thick residuum on limestone at > 60 in.	52	Light	Strong		Bedford 598			227
Loess 12- > 20 ft. thick on limestone	52, 53, 33	Light	Moderate	Alford 308	Muren 453	Iva 454		228
XIV. THIN TO THICK LOESS OR LOAMY MATERIALS WITH OR WITHOUT RESIDUUM ON INTERBEDDED SANDSTONE, SILTSTONE, AND SHALE								
Fine, medium, and coarse sandy residuum on acid sandstone at 20-40 in.	56	Light	None	Boone 397				229
Ch. sh., sis., and ss. resi.; acid sh., ss., and sis. at 20-40 in.	53, 54, 55	Light	Weak	Berks 955, 986				230
Loess < 20 in thick on ch., fl. resi. on acid ss. and sis. at 40-80 in.	53, 54, 55	Light	Weak-moderate	Neotoma 976, 977				231
Lo. mat. 20-40 in. thick on weakly cemented, acid ss. at 20-40 in.	56	Light	Weak-moderate	Eleva 761				232
Loess < 10 in. thick on loamy residuum on acid sandstone at 20-40 in.	56	Dark	Moderate	Hesch 390			Hesch, gray subs. 537	233
			Moderate	Hesch, thin to ss. 389				234
Loess < 10 in. thick on lo. resi., acid ss., sh., and sis. at 20-40 in.	53, 54, 55	Light	Weak	Muskingum 425				235
Loess < 10 in. thick on lo. drift and resi., acid ss., sh., and sis. at 20-40 in.	56	Light	Moderate	——High Gap 556——		Shadeland 555		236
Loess 12-24 in. thick on acid lo. resi., acid ss., sis., and sh. at 20-40 in.[a]	35, 36	Light	Moderate	Frondorf 786				237
Loess 18-36 in. thick on sandy residuum on acid sandstone at < 40 in.	56	Light	Moderate	Gale 413				238
Loam or silt loam till 20-40 in. thick on sandstone	36	Light	Moderate		Kell 421			239
Loess 20-40 in. thick on acid resi. and on ss., sh., and sis. at 40-72 in.	53, 54, 55	Light	Moderate	Wellston 339				240
Loess 24-48 in. thick on acid resi. and on ss., sh., and sis. at 40-80 in.	53, 54, 55	Light	Mod. strong	——Zanesville 340[b]——				241
Loess 20-40 in. thick on > 10 in. resi. on sh., sis., and ss., lims. at > 48 in.	53, 54	Light	Moderate	Westmore 940				242
Loess 12- > 20 ft. thick on sandstone, siltstone, and shale	53, 52, 33	Light	Moderate	Alford 308	Muren 453	Iva 454		243
Loess 7- > 12 ft. thick on sandstone, siltstone, and shale	54, 35	Light	Strong	Wartrace 215	Hosmer 214	Stoy 164	Weir 165	244
Loess 18-35 in. on cherty residuum or gravelly Coastal Plains to > 60 in.	54	Light	Strong		Lax 628			245
Sit. mat. or loess 20-50 in. thick on Coastal Plains gl. mat.	54	Light	Strong	Brandon 956				246
Sit. mat. or loess < 20 in. thick on Coastal Plains gl. mat.	54	Light	Strong	Saffell 956				247

[a] For abbreviations and symbols, see end of Key on page 13.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Loess 48-80 in. on sandstone, siltstone, and shale	55	Light	Str.-v. str.		Grantsburg 301	Robbs 335		248
Loess < 15 in. thick on shale residuum on acid shale at 20-40 in.	32, 34, 56	Light	Moderate		Gosport 551			249
Loess 15-30 in. thick on shale residuum on calcareous shale at 20-40 in.	56	Dark	Moderate	——Schapville 418——		Shullsburg 745	Calamine 746	250
		Light	Moderate	——Derinda 417——				251
Loess 30-50 in. thick on shale residuum on calcareous shale at 40-60 in.	56	Dark	Moderate	——Keltner 546——		Loran 572	Calamine 746	252
		Moderately dark	Moderate	——Massbach 753——		Ridott 743		253
		Light	Moderate	——Eleroy 547——				254
Loess < 10 in. thick on shale residuum on shale or soft clcareous rock at 40-60 in., hard limestone at > 60 in.	54, 55	Light	Moderate	Beasley 691				255
Loess 15-30 in. thick on shale residuum on acid shale at 20-40 in.	56	Light	Moderate	——Marseilles 549——		Marseilles, gray subs. 393		256
XV. SANDY TO CLAYEY ALLUVIAL SEDIMENTS ON BOTTOMLANDS								
Calc.-neutral s., fs., ls., or lfs. to > 40 in.	57	Light	None	Sarpy 92				257
Acid, sit. mat. 12-24 in. thick on ch. or fl. mat. on ss. at > 40 in.	57	Light	None	——Burnside 427——				258
Med. acid-neutral, chr., sit. or lo. mat., lims. at > 42 in.	57	Light	None	Elsah 475				259
Calcareous-neutral loamy material > 48 in. thick	57	Light	None	Stonelick 665				260
Med. acid-mod. alk. fsl. or sl. 20-40 in. thick on sl., fsl., ls., or s.	24	Dark	None-weak	——Landes 304——				261
Med. acid-mod. alk. l., very fsl., or sil. 15-30 in. on very fsl., fs., or lfs.	24	Dark	None-weak	——Ware 456——				262
Med. acid-mod. alk. sicl., cl., l., or sil. 15-30 in. thick on lfs. or s.	24	Dark	None-weak			Riley 452		263
Slightly acid-mod. alk. lo. mat. 15-30 in. thick on l., sil., sl., or fs.	57	Light	None	Genesee 431		Shoals 424		264
Calc.-neutral sil., l., or cl. 20-40 in. thick on sl., l., cr sil.	24	Dark to 24-40 in.	None-weak	——DuPage 321——			Millington 82	265
Slightly acid-mod. alk. l., sil., cl., or fsl. > 40 in. thick	24	Dark to 24-40 in.	None-weak	Ross 73			Confrey 776	266
Med. acid-mod. alk. l., sil., cl., or fsl. 30-50 in. thick on stra. mat.	24	Dark to 10-24 in.	None-weak		Medway 282		Ambraw 302	267
Slightly acid-neutral, lo. alluvium > 40 in. thick on lo., sl. mat.	24	Dark to 24-36 in.	None-weak		Terril 587			268
Acid-neutral loamy material 16-40 in. thick on organic soil material	57	Mod. dark-light	None				Wallkill 292	269
Calcareous silt loam > 40 in. thick on silt loam with sandy lenses	57	Light	None	——Jules 28——				270
Med. acid-mod. alk. sil. > 40 in. thick on sil. with san. lenses	57	Light	None	——Haymond 331——		Wakeland 333	Birds 334	271
Very str.-str. acid sil. > 40 in. thick on sil. with sandy lenses	57	Light	None	——Sharon 72——		Belknap 382	Bonnie 108	272
			Weak			Banlic 787		273
Med. acid-mildly alk. sil. 20-40 in. thick on dark sil.-sicl.	57	Light	None	——Arenzville 78——		Orion 415		274
Med. acid-mildly alk. sil. 20-40 in. thick on sil.-sicl. with B	57	Light	None	——Juneau 782——			Washtenaw 296	275
Med. acid-mildly alk. sil. 20-40 in. thick on dark sic., c., or sicl.	57	Light	None			Dupo 180		276
Medium acid-mildly alkaline silty clay loam > 40 in. thick	57	Light	None				Petrolia 288	277
Very strongly-strongly acid silty clay loam > 40 in. thick	57	Light	None				Piopolis 420	278
Calcareous stratified light and dark silt loam 20-45 in. thick on dark silt loam	57	Light-mod. dark	None	——Dorchester 239[b]——				279
			None	——Dorchester, cobbly 578—				280
Medium acid-mildly alkaline silt loam > 40 in. thick on stratified, medium-textured material[a]	24	Dark to 10-24 in.	None-weak	Huntington 600			Blackoar 603	281
		Dark to 24-40 in.	None-weak	——Huntsville 77——		Lawson 451	Otter 76	282

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Key to Illinois Soils (continued)

Parent material	Area on soil map	Surface color	Degree of development	Natural internal drainage class: Well	Moderately well	Somewhat poor	Poor	Line
Med. acid-mildly alk. sil. 20-40 in. thick on dark sicl.	24	Dark	None-weak			Radford 74		283
Medium acid-mildly alkaline silty clay loam > 40 in. thick on stratified, medium-textured material	24	Dark to 10-24 in.	None-weak	——Armiesburg 597——		Tice 284	Beaucoup 70	284
		Dark to 24-40 in.	None-weak	——Allison 306——			Sawmill 107	285
		Dark to > 40 in.	None-weak				Colo 402	286
Med. acid-mildly alk. sicl. 24-40 in. thick on stra. san. mat.	24	Dark	None-weak				Gorham 162	287
Calcareous silty clay loam > 40 in. thick	24	Dark to > 40 in.	None-weak				Calco 400	288
Med. acid-mod. alk. sic. or c. (50-60% c.) on cl., l., and sl.	24	Dark	None-weak			Nameoki 592	Fults 591	289
Med. acid-mildly alk. sic. or c., 30-40 in. thick on lfs. and fs.	24	Dark	None-weak				Cairo 590	290
Medium acid-mildly alkaline silty clay or clay 12-30 in. thick on stratified loamy material	24	Dark	None-weak			Parkville 619	McFain 248	291
			None-weak			Bowdre 589		292
Acid, sicl. 20-40 in. thick on sic. or c. with few coarser strata	57	Light	None				Cape 422	293
Acid over nonacid sic. to sicl. (35-50% clay) > 40 in. thick	57, 46	Light	None-weak				Bungay 444	294
Strong to medium acid silty clay or clay (45-60% clay) > 40 in. thick	57	Light	None-weak				Karnak 426	295
Medium acid-mildly alkaline, heavy silty clay loam and silty clay (35-45% clay) > 40 in. thick	24	Dark	None-weak				Titus 404	296
		Dark to 24-36 in.	None-weak				Shiloh 138	297
Med. acid-mildly alk. sic. or c. (45-55% clay) > 40 in. thick	24	Dark to 10-24 in.	None-weak				Darwin 71	298
Med. acid-mildly alk. sic. or c. (45-60% clay) > 40 in. thick	24	Dark to > 40 in.	None-weak				Wabash 83	299
Extremely-str. acid c. or sic. (> 60% clay) > 40 in. thick	57	Light	None-weak				Jacob 85	300
Med. acid-neutral c. or sic. (60-75% clay) > 40 in. thick	24, 19	Dark to 10-36 in.	None-weak				Booker 457	301

Parent material	Area on soil map	Type of material	Very poorly drained	Line
XVI. ORGANIC MATERIALS (PEATS AND MUCKS)				
Medium acid-mildly alkaline herbaceous mat. > 51 in. thick	25	Peat	Houghton 97	302
		Muck	Houghton 103	303
Calcareous herbaceous material > 51 in. thick	25	Muck	Lena 210	304
Med. acid-mildly alk. herbaceous mat. 16-50 in. thick on san., gl. mat.	25	Muck	Adrian 777	305
Med. acid-mildly alk. herbaceous mat. 16-50 in. thick on lo. mat.	25	Muck	Palms 100	306
Medium acid-mildly alkaline herbaceous material 16-50 in. thick on Marl	25	Muck	Edwards 312	307
Medium acid-mildly alk. herbaceous material 16-50 in. thick on sedimentary peat	25	Muck	Muskego 638	308

LAND TYPES AND MISCELLANEOUS AREAS

Aquolls 811, Beach sand 367, Blown-out land 63, Dumps 536, Limestone rock land 94, Loamy burned muck 358, (formerly) Mixed alluvial land 455, (formerly) Marsh 718, Orthents 803, Orthents-acid 804, Orthents-clayey 805, Orthents-loamy 802, Orthents-silty 801, Orthents-stony 535, Pits-clay 863, Pits-gravel 865, Pits-quarries 864, Pits-sand 862, Psamments 800, Riverwash 123, Sandstone rock land 9, Sandy alluvial land 604, Shale rock land 95, Terrace escarpments 577, Udifluvents-loamy 407, Urban land 533, Urban land-loamy Orthents complex 392, Urban land-clayey Orthents complex 534.

[a] Abbreviations and symbols: > = greater than; < = less than; alk. = alkaline; br. = bedrock; c = clay; calc. = calcareous; cb. = cobbly; ch. = channery; chr. = cherty; cl = clay loam; fl. = flaggy; fs = fine sand; fsl = fine sandy loam; g = gravel; gl = gravelly; l = loam; lac. = lacustrine; lfs = loamy fine sand; lims. = limestone; lo = loamy; ls = loamy sand; mat. = material; med. = medium; mod. = moderate; om = organic matter; org. = organic; ow. = outwash; resi. = residuum; s = sand; san. = sandy; scl = sandy clay loam; sh = shale; sic = silty clay; sicl = silty clay loam; sil = silt loam; sis = siltstone; sit = silty; sl = sandy loam; ss = sandstone; str. = strong; stra. = stratified; sub. = substratum; subs. = subsoil; v. = very; w. = weak.

[b] Soils centered between the *Well* and *Moderately well* columns cover the entire range from well to moderately well drained.

Soil Association 1

Port Byron-Joy Soils

Soil association 1 occurs in northwestern and western Illinois on uplands near the bluffs along the Mississippi River valley in very thick loess areas. The soils formed under grass vegetation and are dark colored. Soil association 1 usually occurs near association 31, which is its forest soil counterpart. Soil association 1 occupies about 86,800 acres or 0.2 percent of the state's land area.

Port Byron and Joy are the predominant soils in this association. Joy, which is somewhat poorly drained, occurs on the more level areas. Port Byron, the better drained soil, is located on the more sloping areas or narrower ridgetops. Tallula, one of the minor soils, commonly occurs on side slopes. The poorly drained Edgington soils occur in depressions.

The soils of association 1 are weakly developed. They represent the first stage or weak degree of development in the Illinois soil development sequence. Except for Edgington, the soils in this association have silt loam texture throughout their profiles and lack layers or horizons of significant clay accumulation in their subsoils. Because these soils are silty, they have high available-water holding capacities and are very productive, except in those few areas that have sandy substrata.

The productivity of some areas of Joy can be improved by tiling. Areas of Edgington should be drained by tiling or use of open ditches or both. A more common problem than drainage in this association is erosion on the more sloping areas. Fertility problems require sustained attention but can easily be managed with a good soil testing and soil treatment program. Various characteristics and the productivity indexes of the soils in association 1 are given in Table 1.

Soil Association 2

Tama-Muscatine-Sable Soils

Soil association 2 occurs in northwestern and western Illinois. It quite often adjoins association 1, but occurs in slightly thinner loess and is a little farther removed from the Mississippi River valley loess source. This association covers 1,629,400 acres or 4.6 percent of the state's land area.

Association 2 includes Muscatine soils, which represent the second stage or moderate degree of soil development in the Illinois soil development sequence. The major soils of association 2, Tama, Muscatine, and Sable, have silty clay loam subsoils, are moderately permeable, and have high available-soil moisture holding capacities. They provide a very good rooting medium for most crops, especially corn and soybeans, and are among the most productive soils in the state. The Tama soils are moderately well and well drained, and occur on side slopes along drainageways and on narrow or rounded ridgetops. Because they are sloping soils, most areas of Tama are subject to erosion unless adequately protected. The Muscatine soils occur on gentle slopes and are somewhat poorly drained. Sable soils are located on flats or in slightly depressional areas and are poorly drained. Both of these soils can be adequately drained by tiling.

The minor, poorly drained soils of this association, such as Denny, Edgington, and Harpster, occur on nearly level or slightly depressional areas. Edgington and Harpster can be tile drained, but Denny, because of its slowly permeable subsoil, must be drained by ditches or by tile through a surface inlet. Minor, sloping soils such as Assumption, Keller, and Tallula are subject to erosion if planted in row crops. Most areas of these soils, especially those having slopes of more than about 5 percent, should be planted in hay or pasture crops.

Even though association 2 is one of the most productive areas in the state, it does have fertility problems. Normally, these problems can easily be solved through regular soil testing and soil treatment programs. Since Harpster soils are calcareous (limey) on the surface, they should not be limed. Because of the high content of lime in their surfaces, these soils may also need more phosphorus and potassium than other soils in this area. Various characteristics and the productivity indexes of the soils in association 2 are given in Table 2.

Soil Association 3

Tama-Ipava-Sable Soils

Soil association 3 is located in central and west central Illinois, and is most extensive on the flat to gently sloping uplands on the divides between streams. It occupies 3,043,300 acres or 8.5 percent of the state's land area. This association includes highly productive, dark-colored soils that have developed in loess under native prairie grasses. These soils, particularly the Ipava, are in the third stage of the soil development sequence in Illinois, and are considered to be moderately to moderately strongly developed. Many of the soils, except for the Ipava, are the same as those found in soil association 2. The major soils of association 3 are considered to be the prairie or dark-colored counterpart of the light-colored soils of association 34, which formed under forest. The soils of this area contain slightly more clay than the soils in association 2. Soils in association 3 are well structured and permeable, and, because of their high capacity to store water, are well suited to intensive corn and soybean production.

The Tama soils occur on narrow, rounded ridgetops and on side slopes. They are moderately well drained and well drained, and must be carefully managed to protect

Table 1. Characteristics and Productivity Indexes of Soil Association 1 — Port Byron-Joy Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
272 Edgington	0-1	31	sil	3.5	B	24	sicl	Poor	Mod. slow-slow	L	M	sil loess	11.9	0.32	125	100
275 *Joy*	0-5	19	sil	3.0	B	29	sil	SW. poor	Moderate	M	H	sil loess	13.0	0.28	155	128
277 *Port Byron*	1-12	17	sil	3.0	B	31	sil	Well-mod. well	Moderate	H	H	sil loess	12.9	0.32	145	120
562 Port Byron, san. sub.	1-12	18	sil	3.0	B	24	sil-l	Well-mod. well	Mod.-rapid	M	M	aeolian fs	9.1	0.32	125	100
34 Tallula	5-20	15	sil	3.0	B	12	sil	Well-mod. well	Moderate	M	M	calc. sil loess	12.5	0.32	120	95

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 2. Characteristics and Productivity Indexes of Soil Association 2 — Tama-Muscatine-Sable Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
259 Assumption	2-18	12	sil	3.5	B	35	sicl	Well-mod. well	Mod.-mod. slow	M	M	cl till paleosol	10.2	0.32	125	98
45 Denny	0-2	20	sil	3.0	C	30	sicl	Poor	Slow	L	M	sil loess	11.4	0.37	110	90
272 Edgington	0-1	31	sil	3.5	B	24	sicl	Poor	Mod. slow-slow	L	M	sil loess	11.9	0.32	125	100
67 Harpster	0-2	15	sicl	5.5	A	24	sicl	Poor	Moderate	L	L	sil-l wash	11.3	0.28	135	110
470 Keller	2-12	10	sil	3.5	B	35	sic-cl-c	SW. poor	Slow	L	L	cl till paleosol	9.3	0.37	95	80
41 *Muscatine*	0-3	16	sil	4.5	B	34	sicl	SW. poor	Moderate	M	H	sil loess	12.2	0.28	160	130
68 *Sable*	0-2	20	sicl	5.5	A	27	sicl	Poor	Moderate	L	M	sil loess	12.3	0.28	155	128
34 Tallula	5-20	15	sil	3.0	B	12	sil	Well-mod. well	Moderate	M	M	sil loess	12.5	0.32	120	95
36 *Tama*	1-20	14	sil	3.5	B	35	sicl	Well-mod. well	Moderate	H	H	sil loess	12.1	0.32	150	125

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

them from erosion. Some have already lost part of their naturally dark-colored surface soil and now have subsoil material mixed into the plow layer. Ipava and Sable soils commonly occur on broad, nearly flat ridge tops. They are naturally wet and require artificial drainage for optimum productivity. Ipava soils, which are somewhat poorly drained, occur on gentle slopes on the moderately wide ridge tops and along the edges or on the very slightly elevated areas of wider ridge tops. Sable soils are poorly drained and occupy the flatest areas toward the center of the broad ridge tops.

Edinburg, Hartsburg, Harpster, and Denny, which are among the minor soils in this association, commonly occur in flat to slightly depressional areas on ridgetops and are associated with Sable or Ipava soils. They are naturally wet and require artificial drainage. Elkhart, Tallula, Velma, Keller, and Assumption soils occur on gently sloping to steep side slopes along major drainageways. Erosion is the principal management problem with these soils. Velma, Keller, and Assumption are on sloping areas where the loess is thin. The lower part of each of these soils developed in the underlying glacial till. Harpster and Tallula soils are calcareous at the surface; Elkhart and Hartsburg soils are acid at the surface but calcareous within 40 inches of the surface. Various characteristics and the productivity indexes of the soils in association 3 are given in Table 3.

Soil Association 4

Herrick-Virden-Piasa Soils

Soil association 4 occurs in west central Illinois, primarily in Hancock and Adams counties between the Illinois and Mississippi rivers and in an area east of the mouth of the Illinois River extending from Jersey County south to St. Clair and Washington counties and east to Christian and Shelby counties. These soils are most extensive on the flat to gently sloping uplands on the divides or ridges between major streams. The soils cover 1,052,700 acres or 2.9 percent of the state's land area. This association includes moderately to strongly developed soils that formed under grass in loess, ranging on nearly level areas from about 5 to 7 feet in thickness. In the more sloping areas, the soils formed in thinner loess over paleosols. Soil association 4 is the last association of the Illinois soil development sequence that is dark-colored enough to be included in the Mollisol soil order (see page 72). Soil association 34 is considered to be the forested counterpart of soil associations 3 and 4.

The Tama soils, which occur on ridgetops and side slopes in association 4, are medium-textured throughout, being high in silt and very low in sand. They are well structured and permeable and have a high capacity to store water for plants. They are used primarily for intensive corn and soybean production. Tama soils are moderately well drained and well drained, and must be carefully managed to protect them from erosion. Many areas have already lost part of their naturally dark-colored surface soil to erosion.

Herrick and Virden soils commonly occur on nearly flat ridgetops. Herrick normally has some surface slope and is somewhat poorly drained, while Virden occurs on flatter areas and is poorly drained. Tile function somewhat slowly but usually adequately in these two soils, which represent stage 4 in the Illinois soil development sequence. These soils contain slightly higher clay concentrations in their subsoils and are slightly less permeable than soils of similar natural soil drainage in associations 1, 2, and 3 of the soil development sequence.

Piasa, Tamalco, Darmstadt, Huey, and Walshville, which are among the minor soils in this association, have excessively high sodium levels. Piasa and Huey soils developed in loess and are commonly associated with Virden and Herrick soils in flat to depressional areas on ridgetops. They are poorly drained and are too impermeable for tile to function effectively in them. Tamalco, Darmstadt, and Walshville, which have better natural drainage, occur on areas having a convex or more sloping surface. Piasa, Tamalco, Darmstadt, and Huey soils respond to good soil management, but seldom, if ever, equal the productivity of associated soils such as Herrick and Virden. The more or less random occurrence and variable size and shape of the high sodium soils among nonsodium soils create difficult management problems. In general, both the high and low sodium soils must be farmed together. Where they are intimately mixed, they are often shown as complexes on county soil maps.

Douglas and Harrison soils occur on sloping areas where the loess is about 40 to 60 inches thick over gray or reddish paleosols. The upper part of their profiles (in loess) is similar to that of Tama. The lower part contains more sand and pebbles. Coatsburg, Keller, Assumption and Pana have developed in less than 40 inches of loess and the underlying paleosol. They commonly occur on gently sloping to steep upper side slopes, coves, and narrow, sloping ridgetops. Velma and Walshville soils have developed in glacial till and commonly occur on moderately steep to steep lower side slopes. Various characteristics and the productivity indexes of the soils in association 4 are given in Table 4.

Soil Association 5

Oconee-Cowden-Piasa Soils

Soil association 5 occurs in southwestern and south central Illinois, from Randolph County on the southern end, northward to Montgomery County, and then eastward to Clark County. It covers about 608,000 acres or 1.7 percent of the state's land area.

Table 3. Characteristics and Productivity Indexes of Soil Association 3 — Tama-Ipava-Sable Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
259 Assumption	2-18	12	sil	3.5	B	35	sicl	Well-mod. well	Mod.-mod. slow	M	M	cl till paleosol	10.2	0.32	125	98
45 Denny	0-2	20	sil	3.0	C	30	sicl	Poor	Slow	L	M	sil loess	11.4	0.37	110	90
249 Edinburg	0-1	16	sicl	3.5	A	35	sicl	Poor	Slow-mod. slow	L	M	sil loess	11.3	0.28	130	107
567 Elkhart	3-20	10	sil	3.0	B	20	sicl	Well-mod. well	Moderate	M	H	sil loess	12.1	0.32	125	100
67 Harpster	0-2	15	sicl	5.5	A	24	sicl	Poor	Moderate	L	L	sil-l wash	11.2	0.28	135	110
244 Hartsburg	0-2	17	sicl	4.0	A	18	sicl	Poor	Moderate	L	L	sil loess	12.2	0.28	140	118
43 *Ipava*	1-4	16	sil	4.5	B	34	sicl	SW. poor	Moderate	M	H	sil loess	12.2	0.28	160	130
470 Keller	2-12	10	sil	3.5	B	35	sic-cl-c	SW. poor	Slow	L	L	cl till paleosol	9.3	0.37	95	80
68 *Sable*	0-2	20	sicl	5.5	A	27	sicl	Poor	Moderate	L	M	sil loess	12.2	0.28	155	128
34 Tallula	5-20	15	sil	3.0	B	12	sil	Well-mod. well	Moderate	M	M	sil loess	12.4	0.32	120	95
36 *Tama*	1-20	14	sil	3.5	B	35	sicl	Well-mod. well	Moderate	H	H	sil loess	12.1	0.32	150	125
250 Velma	7-20	14	l	3.5	C	37	cl	Well-mod. well	Mod.-mod. slow	M	M	l till	11.2	0.32	120	92

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 4. Characteristics and Productivity Indexes of Soil Association 4 — Herrick-Virden-Piasa Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
259 Assumption	2-18	12	sil	3.5	B	35	sicl	Well-mod. well	Mod.-mod. slow	M	M	cl till paleosol	10.2	0.32	125	98
660 Coatsburg	5-20	12	sil	4.0	B	48	cl-c	Poor	Slow-v. slow	M	M	cl paleosol	8.8	0.37	75	58
620 Darmstadt	1-10	11	sil	2.0	C	28	sic-sicl	SW. poor	Slow-v. slow	M	L	sil-l wash	7.4	0.43	80	62
128 Douglas	2-15	11	sil	3.0	B	36	sicl	Well	Moderate	M	M	cl paleosol	11.4	0.28	130	92
127 Harrison	0-10	15	sil	3.0	B	32	sicl	Mod. well	Moderate	M	M	cl paleosol	11.7	0.32	130	105
252 Harvel	0-1	13	sicl	4.0	A	35	sil-sicl	Poor	Moderate	L	M	cl paleosol	11.0	0.28	135	112
46 *Herrick*	0-3	15	sil	3.5	B	36	sicl	SW. poor	Mod. slow	M	M	sil loess	10.6	0.28	140	115
120 Huey	0-2	11	sil	2.0	C	32	sil-sicl	Poor	V. slow	L	L	lo wash on till paleosol	7.4	0.43	75	58
470 Keller	2-12	10	sil	3.5	B	35	sic-cl-c	SW. poor	Slow	L	L	cl till paleosol	9.3	0.37	95	80
256 Pana	5-15	12	sil	3.0	B	45	gl-cl	Well	Mod. rapid	L	M	gl loam ow.	8.0	0.32	105	85
474 *Piasa*	0-2	11	sil	3.0	C	35	sicl-sic	Poor	V. slow-slow	M	L	lo wash on till paleosol	7.6	0.37	80	65
36 Tama	1-20	14	sil	3.5	B	35	sicl	Well-mod. well	Moderate	H	H	sil loess	12.1	0.32	150	125
581 Tamalco	1-4	10	sil	2.0	C	32	sicl-sic	Mod. well	Slow-v. slow	L	L	lo wash on till paleosol	8.1	0.43	75	60
250 Velma	7-20	14	l	3.5	B	37	cl	Well-mod. well	Mod.-mod. slow	M	M	l till	11.2	0.32	120	92
50 *Virden*	0-2	16	sicl	5.0	A	34	sicl	Poor	Mod. slow	L	M	sil loess	10.4	0.28	135	112
584 Walshville	4-15	9	l	2.0	C	40	cl	Mod. well	V slow	L	L	l till	7.7	0.43	65	50

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 5. Characteristics and Productivity Indexes of Soil Association 5 — Oconee-Cowden-Piasa Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
660 Coatsburg	5-20	12	sil	4.0	B	48	cl-c	Poor	Slow-v. slow	M	M	cl paleosol	8.8	0.37	75	58
112 *Cowden*	0-3	17	sil	2.5	C	33	sicl-sic	Poor	Slow	L	M	sil loess	11.2	0.37	120	95
620 Darmstadt	1-10	11	sil	2.0	C	28	sicl-sic	SW. poor	Slow-v. slow	M	L	sil-l wash	7.4	0.43	80	62
128 Douglas	2-15	11	sil	3.0	B	36	sicl	Well	Moderate	M	M	cl paleosol	11.4	0.28	130	92
127 Harrison	0-10	15	sil	3.0	B	32	sicl	Mod. well	Moderate	M	M	cl paleosol	11.7	0.32	130	105
120 Huey	0-2	11	sil	2.0	C	32	sil-sicl	Poor	V. slow	L	L	lo wash on till paleosol	7.4	0.43	75	58
113 *Oconee*	1-7	15	sil	2.5	C	35	sicl	SW. poor	Slow	L	M	sil loess	10.8	0.37	120	95
256 Pana	5-15	12	sil	3.0	B	45	gl cl	Well	Mod. rapid	L	M	gl l ow.	8.0	0.32	105	85
474 *Piasa*	0-2	11	sil	3.0	C	35	sicl-sic	Poor	V. Slow-slow	M	L	lo wash on till paleosol	7.6	0.37	80	65
581 Tamalco	1-4	10	sil	2.0	C	32	sicl-sic	Mod. well	Slow-v. slow	L	L	lo wash on till paleosol	8.1	0.43	75	60
250 Velma	7-20	14	l	3.5	B	37	cl	Well-mod. well	Mod.-mod. slow	M	M	l till	11.2	0.32	120	92
584 Walshville	4-15	9	l	2.0	C	40	cl	Mod. well	V. slow	L	L	l till	7.7	0.43	65	50

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

The major soils, Oconee, Cowden, and Piasa, occur on the more nearly level drainage divides where the loess is about 4 to 6 feet thick over the Sangamon paleosol. These soils, especially Cowden, are strongly developed and represent stage 5 in the Illinois soil development sequence. Generally, they are dark to moderately dark and formed under grass. They have heavy or fine textured subsoils, are slowly or very slowly permeable, and are not tileable. They are used for corn, soybean, wheat, and forage production and respond to good management. Many of the minor soils, including several that are high in sodium, are also in soil associations 4 and 6. The soils of association 35 also formed in loess over paleosols but under forest, and are considered to be the forested counterparts of the soils in association 5.

Oconee soils occur on slightly rounded, moderately wide ridgetops and along the edges of broad ridgetops. They are normally drained by shallow surface ditches. Because these soils are sloping, erosion control is one of the greatest management problems with them. Many areas have already lost part of their surface soil and now have reduced productivity because some of the less favorable subsoil has been mixed into the plow layer. Darmstadt and Tamalco soils are associated with Oconee soils in many places.

Cowden and Piasa soils occur on nearly flat ridgetops. Piasa soils have excessive sodium levels in their subsoils and form small, irregularly shaped bodies (often known locally as "slick spots") distributed within the larger bodies of Cowden soils. In many areas, the Cowden and Piasa soils are so mixed on the landscape that they could not be separated in mapping and are shown as soil complexes on county soil maps. Both Cowden and Piasa soils are poorly drained and do not respond well to tile drainage because of slow to very slow permeability in their subsoils. These soils are commonly drained by means of surface drainage.

Among the minor soils in this association Tamalco, Darmstadt, Huey, and Walshville soils (commonly called slick soils or slick spots) have excessive levels of sodium in their subsoils. They are poorly drained to moderately well drained, and are associated with Cowden, Oconee, and Piasa soils on the nearly flat to gently sloping ridgetops. Like the Piasa soils, they are too impermeable for tile to function effectively in them. Tamalco, Darmstadt, and Walshville have better natural drainage and are on areas having a convex or more sloping surface. Tamalco, Darmstadt, Huey, Douglas, and Harrison soils have developed in loess greater than 40 inches thick over a gray paleosol in Illinoian till. Because the high-sodium soils are often closely intermingled with the nonsodium soils on the landscape, the two must be farmed together. The high sodium soils respond to good crop and soil management, but yields are generally only about 60 to 70 percent of those on the associated nonsodium soils.

Coatsburg, Keller, Assumption, and Pana have developed in less than 40 inches of loess and the underlying paleosol. They commonly occur on gently sloping to steep upper side slopes, coves, and narrow, sloping ridgetops. Velma and Walshville soils developed in glacial till, and commonly occur on moderately steep to steep lower side slopes. Various characteristics and the productivity indexes of the soils in association 5 are given in Table 5.

Soil Association 6

Hoyleton-Cisne-Huey Soils

Soil association 6 occurs in all of southern Illinois except in counties along the Mississippi River and the seven counties in the extreme southern part of the state. This association occupies about 1,508,600 acres or 4.2 percent of the state's land area.

These soils formed under prairie grass on nearly level to moderately steep upland areas where the loess is about 30 to 55 inches thick over the very slowly permeable Sangamon paleosol. On nearly level areas, there is usually a layer one to several feet thick of loamy material between the loess and the very slowly permeable subsoil of the Sangamon paleosol. This loamy layer is a mixed zone of the surface layer or wash from the Sangamon paleosol and the Roxana loess, which is an early Wisconsinan increment of loess. The present surficial soil formed mainly in the more recent Peoria loess but extends into the mixed zone and upper part of the Sangamon paleosol.

The soils of association 6 are markedly influenced by the underlying paleosol. They are strongly to very strongly developed, representing stage 6, the most weathered and last stage in the Illinois soil development sequence. Most of these soils are poor or somewhat poorly drained, although some of the more sloping soils are moderately well drained and well drained. The Hoyleton, Cisne, and Huey soils dominate the landscape in many parts of southern Illinois. They occur mainly on nearly level and gently sloping, medium-wide upland areas between streams.

Cisne soils dominate the broad upland, nearly level loess-covered Illinoian till plains of this association. These very slowly permeable soils are the poorly drained members of a drainage sequence that includes the somewhat poorly drained, slowly permeable Hoyleton soils and the moderately well and well drained, moderately permeable Richview soils. Hoyleton and Richview soils generally occur on gently sloping and sloping mounds, ridges, and side slopes of drainageways. Newberry and Ebbert soils are also closely associated with the Cisne soils. They occur in level and depressional areas, and are slowly permeable. The dark surface of the poorly drained Newberry soils is thinner than that of Ebbert soils, which are poor to very poorly drained.

The poorly drained, slowly permeable Chauncey soils form a drainage sequence with the somewhat poorly drained, slowly permeable Lukin soils. Chauncey soils occur on nearly level areas or are slightly depressional. The gently sloping Lukin soils occur on loess-covered Illinoian till plains or alluvial terraces, and commonly receive runoff water from higher ground.

The poorly drained Huey soils form a drainage sequence with the somewhat poorly drained Darmstadt soils and the moderately well drained Tamalco soils. All these soils are slowly or very slowly permeable and associated with Cisne and Hoyleton soils, and have a high concentration of sodium in the B horizon. Huey soils are nearly level. Darmstadt and Tamalco soils are commonly gently sloping. Piasa soils, which are also high in sodium, have a darker surface color than Huey soils, and have more clay in the subsoil. Walshville soils also have excessive sodium in the subsoil, and are moderately well drained, sloping, and strongly sloping soils.

All of these high sodium soils (known locally as "slick spots") are often intimately mixed with nonsodium soils and are usually farmed with them. The high sodium soils respond to good management but are not as productive as the associated nonsodium soils.

The remaining soils of this association occur primarily on sloping to moderately steep areas. They also occur in other associations, including several in west central and western Illinois. Pana soils formed in thin or no loess on sandy or gravelly glacial drift, and are moderately rapidly

Table 6. Characteristics and Productivity Indexes of Soil Association 6 — Hoyleton-Cisne-Huey Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
287 Chauncey	0-3	30	sil	3.0	C	25	sicl-sic	Poor	Slow	L	L	loamy wash	11.8	0.37	120	95
2 *Cisne*	0-3	17	sil	2.0	C	38	sicl-sic	Poor	V. slow	L	L	lo wash on till paleosol	10.9	0.37	115	88
660 Coatsburg	5-20	12	sil	4.0	B	48	cl-c	Poor	Slow-v. slow	M	M	cl paleosol	8.8	0.37	75	58
620 Darmstadt	1-10	11	sil	2.0	C	28	sicl-sic	SW. poor	Slow-v. slow	M	L	sil-l wash	7.4	0.43	80	62
48 Ebbert	0-1	20	sil	3.0	B	30	sicl	Poor-v. poor	Slow	L	L	lo wash on till paleosol	12.1	0.37	135	110
3 *Hoyleton*	0-6	13	sil	2.0	C	35	sicl-sic	SW. poor	Slow	L	L	lo wash on till paleosol	11.1	0.37	115	88
120 *Huey*	0-2	11	sil	2.0	C	32	sil, sicl	Poor	Very slow	L	L	lo wash on till paleosol	7.4	0.43	75	58
167 Lukin	1-4	26	sil	2.5	C	25	sicl	SW. poor	Slow	L	M	lo wash on till paleosol	11.8	0.37	120	92
218 Newberry	0-3	18	sil	2.5	C	32	sicl	Poor	Slow	L	L	lo wash on till paleosol	12.0	0.37	120	92
256 Pana	5-15	12	sil	3.0	B	45	gl cl	Well	Mod. rapid	L	M	gl loam ow.	8.0	0.32	105	85
474 Piasa	0-2	11	sil	3.0	C	35	sicl-sic	Poor	V. slow-slow	M	L	lo wash on till paleosol	7.6	0.37	80	65
4 Richview	3-12	12	sil	2.0	C	40	sicl	Mod. well-well	Moderate	L	L	lo wash on till paleosol	11.8	0.32	110	85
581 Tamalco	1-4	10	sil	2.0	C	32	sicl-sic	Mod. well	Slow-v. slow	L	L	lo wash on till paleosol	8.1	0.43	75	60
250 Velma	7-20	14	l	3.5	B	37	cl	Well-mod. well	Mod.-mod. slow	M	M	l till	11.2	0.32	120	92
284 Walshville	4-15	9	l	2.0	C	40	cl	Mod. well	Very slow	L	L	l till	7.7	0.43	65	50

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

permeable. Coatsburg and Velma soils formed in thin or no loess and Illinoian or Kansan glacial till. Coatsburg soils are poorly drained, have clayey subsoils, and are slow or very slowly permeable. Velma soils are well and moderately well drained and are moderately or moderately slowly permeable. Most of the forested counterparts of the soils in association 6 are in soil association 36.

Major problems on the less sloping soils in association 6 are restricted permeability, low fertility, and a high water table during wet seasons. Some of these soils have excessive sodium in the subsoil. On the more sloping soils, erosion, low fertility, and in some areas, low available-water holding capacity are problems.

Although some sloping areas of these soils are in permanent pasture or woodland most of this association is cropland. Corn, soybeans, wheat, milo, and hay are the principal crops. The soils in this association respond very well to additions of lime and fertilizer and to other good management practices. Drainage, which is needed in the nearly level areas, is best provided by open ditches. Various characteristics and the productivity indexes of the soils in association 6 are given in Table 6.

Soil Association 7

Winnebago-Durand-Ogle Soils

Soil association 7 occurs in extreme northern Illinois, mainly in Stephenson, Winnebago, Ogle, and Carroll counties. Most areas are small and occur in a scattered pattern. This association occupies about 83,200 acres or 0.2 percent of the state's land area.

These dark-colored soils developed under grass vegetation in nearly level to strongly sloping upland areas. They developed in thin loess over reddish, weathered drift (paleosols) of Illinoian age. Although the drift is predominantly till, some areas have kame deposits and poorly stratified, water-deposited sediment. The loess covering the till is as thick as 50 inches in the nearly level areas but may be less than 15 inches thick or absent in the strongly sloping areas. These soils occur with or near the light-colored soils of soil association 37, which developed in the same kinds of materials, and which are considered to be the forested analogues of the soils in association 7.

These soils are well drained or moderately well drained, have moderate permeability, and do not need tiling. The Ogle, Durand, and Winnebago soils differ mainly in the thickness of the loess cover over the reddish, weathered drift. Ogle soils have 30 to 50 inches, Durand 15 to 30 inches, and Winnebago less than 15 inches of loess cover. The Ogle soils, which have a silt loam substratum, occur only in a small area in southwestern Carroll County. They have weakly developed subsoils in the loess portion of the profile, which are silt loam in texture.

Most areas of these soils are used for corn, soybeans, small grain, or hay production, but a few strongly sloping areas, particularly of Winnebago soils are maintained in permanent pasture. All are responsive to good management. The Winnebago soils tend to be somewhat drouthy during prolonged periods of dry weather. All of these soils are susceptible to erosion on the steeper slopes, where moderate erosion is common. Various characteristics and the productivity indexes of soils in association 7 are given in Table 7.

Soil Association 8

Broadwell-Waukegan-Pillot Soils

Soil association 8 occurs in a scattered pattern in small areas of central and northwestern Illinois. In central Illinois, these soils occur mainly in Christian, Logan, Mason, and Menard counties, with the largest areas in Logan County. In northwestern Illinois, the association occurs mainly in Whiteside County, with small areas in Carroll and Henry counties. Total areas of this association is about 166,500 acres or 0.5 percent of the state's land area.

Table 7. Characteristics and Productivity Indexes of Soil Association 7 — Winnebago-Durand-Ogle Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
416 *Durand*	1-20	13	sil	4.0	B	47	cl	Well-mod. well	Moderate	M	H	cl paleosol	11.0	0.32	130	105
412 *Ogle*	2-18	15	sil	4.0	B	45	sicl-cl	Well	Moderate	H	H	cl paleosol	11.1	0.32	135	110
574 Ogle, sil. sub.	2-7	14	sil	4.0	B	40	sil-cl	Well	Moderate	H	H	cl paleo sol	9.8	0.32	105	85
728 *Winnebago*	2-30	14	sil	4.0	B	46	cl-scl	Well-mod. well	Moderate	M	M	cl-sl paleosol	10.6	0.32	120	95

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

These dark-colored soils developed in less than 60 inches of loess over loamy sand or sand deposits in upland areas and on terraces or outwash plains. The sandy materials are believed to have been deposited by wind in much of this association, with lesser amounts having been deposited by water. The soils developed under grass in nearly level to moderately sloping landscape positions. These soils occur with or near the light-colored soils of soil association 38, which developed in the same kinds of materials under forest and are considered to be the forested counterparts of the soils in association 8.

The Lawndale soils in this association are somewhat poorly drained and need tiling for maximum production. The other soils are well or moderately well drained and do not require artificial drainage. Lawndale and Broadwell soils typically have between 40 to 60 inches of loess over the sandy materials and have moderate permeability and moderately developed subsoils. Waukegan and Pillot soils have developed in 20 to 40 inches of loess over the sandy materials; they have moderate permeability in the upper portion of the profile but rapid permeability in the lower portion. Waukegan soils differ mainly from Pillot soils in having weaker developed subsoils of silt loam texture in the loess portion of the profile. The portion of the association occurring in Whiteside and Carroll counties is composed entirely of Waukegan soils.

Most of the soils in this association are used for corn, soybean, small grain, or hay production and respond well to good management. The Pillot and Waukegan soils tend to be drouthy during prolonged periods of dry weather because the sand underlying them is at a relatively shallow depth. Controlling erosion is a problem on the more sloping areas of these soils except for Lawndale, which occurs in level to gently sloping landscape positions. Various characteristics and the productivity indexes of the soils in association 8 are given in Table 8.

Soil Association 9

Catlin-Flanagan-Drummer Soils

Soil association 9 occurs in the east central, central, and north central part of Illinois. The Catlin, Flanagan, and Drummer soils dominate the landscapes in this association. The minor soils, Peotone, Harpster, and Pella, usually occur in scattered, small areas. This association has a total area of about 2,104,600 acres or 5.9 percent of the state's land area.

These soils formed in moderately thick loess (40 to 60 inches) and commonly occur on upland till plains, with many areas appearing to be nearly level. Other areas occur on end moraines, which are the more sloping areas that have 40 to 60 inches of loess extending into regions of thicker loess.

These dark-colored soils formed under grass and are moderately to moderately strongly developed. They have high available-water holding capacity and moderate permeability. Slopes of the well drained and moderately well drained Catlin soils range from nearly level to sloping. These soils occur on the higher portion of the landscape or side slopes along drainageways where runoff is medium. Slopes of the somewhat poorly drained Flanagan soils range from nearly level to gently sloping. These soils contain more clay in the subsoil than the Catlin or the Drummer soils. They typically occur on higher parts of the landscape than the poorly drained Drummer soils and have medium to slow runoff. The nearly level, poorly drained Drummer soils are the dominant soil in this association. They have slow to ponded runoff. The light-colored soils in association 39 are the forested analogue of association 9 soils.

The minor soils in this association are all poorly drained. The Peotone soils, which usually occur in depressions, are often drained by means of surface inlets

Table 8. Characteristics and Productivity Indexes of Soil Association 8 — Broadwell-Waukegan-Pillot Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
										Supply of						
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
684 *Broadwell*	0-12	15	sil	4.0	B	39	sicl	Well-mod. well	Moderate	H	H	ls-fs aeolian	11.3	0.32	140	118
683 Lawndale	0-3	17	sil	4.0	B	35	sicl	SW. poor	Moderate	M	H	ls-fs aeolian	11.1	0.32	155	128
159 *Pillot*	0-12	15	sil	3.5	B	21	sicl-scl	Well	Mod.-rapid	M	L	ls-fs aeolian	8.7	0.32	110	90
564 *Waukegan*	0-12	15	sil	3.5	B	18	sil-l	Well	Mod.-rapid	M	L	ls-fs aeolian	8.0	0.32	110	90

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

into tile. Since Harpster soils are calcareous (limey), limestone should not be applied to them. Phosphorus and potassium fertilization may have to be higher than with Drummer because of the high pH and tie-up of nutrients in the surface soil of the Harpster. Pella is similar to Drummer in many respects except that it has carbonates (lime) at depths less than 40 inches and is not quite as productive.

The Catlin and Flanagan soils are subject to erosion. Tile drainage of the Flanagan soil will improve crop yields in some years. Surface ditches and tile drainage help improve crop yields on the Drummer soils in most years.

Most areas of these soils are planted in cultivated crops, particularly corn and soybeans. These soils respond to good management and are among the most productive soils in the state. Various characteristics and the productivity indexes of the soils in association 9 are given in Table 9.

Soil Association 10

Wenona-Rutland-Streator Soils

Soil association 10 occurs in a small area of the north central part of Illinois in La Salle, Livingston, Marshall, and Woodford counties. It has a total area of 134,400 acres or 0.4 percent of the state's land area. Rutland soils dominate most landscapes on which these soils occur.

The soils are formed in 40 to 60 inches of loess and the underlying clayey glacial till or lacustrine material. They are nearly level to strongly sloping, and occur on upland till plains or small glacial lakebeds. Since the native vegetation was tall prairie grasses, the soils are dark colored.

These soils have a moderate to high available-water holding capacity. They have less available water than thick loess soils because of the silty clay or clay at a depth of 40 to 60 inches, which limits to some extent the depth of root penetration by farm crops commonly grown in the area. Permeability is moderately slow in the loess subsoil and slow in the underlying material. The slope of the well-drained Wenona soils ranges from gently to strongly sloping, and surface runoff is medium. Wenona soils occur on the highest portion of the landscape or on side slopes along drainageways. The slope of the somewhat poorly drained Rutland soils ranges from nearly level to gently sloping. These soils occur on the stable part of the landscape, and surface runoff is slow to medium. The poorly drained Streator soils have nearly level slopes. They occupy upland swales and drainageways where surface runoff is very slow to ponded.

The Wenona and Rutland soils are subject to erosion. Tile drainage of the Rutland soils will help improve crop yields in some years. Surface and tile drainage of the Streator soils will help improve crop yields in most years.

Most areas of these soils are planted in cultivated crops, primarily corn and soybeans, and they respond to good management. Various characteristics and the productivity indexes of the soils in association 10 are given in Table 10. Although not listed in Table 10, Peotone soils (discussed under association 9) and Rantoul soils (discussed under association 16) are present in some parts of association 10.

Soil Association 11

Plano-Proctor-Worthen Soils

Soil association 11 occurs principally in the northern and central parts of Illinois but also in some of the counties near the Mississippi and Ohio rivers in southern Illinois. This association has a total area of about 1,859,300 acres or 5.2 percent of the state's land area.

These dark-colored soils occur on nearly level to sloping glacial outwash plains and alluvial terraces. A few occur on sandy loam till or drift plains. The soils in this association formed under grass in various thicknesses of loess or silty material over mainly stratified silty, loamy, or sandy sediments, and range from very poorly drained to well drained. The soils of association 41 are mainly the forested counterparts of soils in association 11.

A number of soil drainage sequences are present in soil association 11. The well and moderately well drained Barrington soils form a drainage sequence with the somewhat poorly drained Mundelein soils and the poorly drained Pella soils. The main area of these three soils is extreme northeastern Illinois. All of these soils formed in loess or silty material and calcareous stratified silty, loamy, or sandy outwash. Barrington soils, which are nearly level and gently sloping, usually occur on crests of ridges and upper parts of slopes. Mundelein soils are also nearly level and gently sloping, but are commonly found lower on slopes than the nearby Barrington soils and on broad, nearly level areas. Pella soils are nearly level or depressional and are generally downslope from the other members of this drainage sequence when they are in the same landscape. Barrington and Pella soils are moderately permeable. Mundelein soils are moderately to moderately slowly permeable.

The well and moderately well drained Proctor soils form a drainage sequence with the somewhat poorly drained Brenton soils and the poorly drained Drummer soils. These soils are common throughout association 11.

Table 9. Characteristics and Productivity Indexes of Soil Association 9 — Catlin-Flanagan-Drummer Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
171 *Catlin*	0-12	12	sil	3.5	B	38	sicl	Well-mod. well	Moderate	M	H	l or sicl till or lac.	10.9	0.32	145	120
152 *Drummer*	0-2	15	sicl	6.0	A	33	sicl	Poor	Moderate	L	H	lo ow.	11.7	0.28	150	125
154 *Flanagan*	0-7	17	sil	4.5	B	36	sicl	SW. poor	Moderate	M	H	l or sicl till or lac.	12.0	0.28	160	130
67 Harpster	0-2	15	sicl	5.5	A	24	sicl	Poor	Moderate	L	L	lo wash	11.2	0.28	135	110
153 Pella	0-2	13	sicl	5.5	A	25	sicl	Poor	Moderate	L	M	lo ow.	11.2	0.28	140	115
330 Peotone	0-2	16	sicl	6.0	A	32	sicl	Poor-v. poor	Mod. slow	L	M	l or sicl till	10.2	0.28	120	100

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 10. Characteristics and Productivity Indexes of Soil Association 10 — Wenona-Rutland-Streator Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
375 *Rutland*	1-5	16	sil	4.5	B	33	sicl-sic	SW. poor	Mod. slow-slow	M	H	sic-c till or lac.	9.6	0.28	135	112
435 *Streator*	0-3	14	sicl-sic	5.5	A	34	sicl-sic	Poor	Mod. slow-slow	L	H	sic-c till or lac.	8.6	0.28	130	108
388 *Wenona*	2-15	14	sil	3.5	B	35	sicl-sic	Well-mod. well	Mod. slow-slow	M	H	sic-c till or lac.	8.4	0.32	125	102

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

They are moderately permeable, and some Proctor soils are also moderately rapidly permeable. All of these soils formed in loess or silty material and loamy outwash. Proctor soils occur on the nearly level to strongly sloping parts of the landscape. Drummer soils on the nearly level or depressional parts, and the nearly level Brenton soils are on the intermediate parts.

The well and moderately well drained Plano soils form a drainage sequence with the somewhat poorly drained Elburn soils and the Drummer soils. They are most common in central and western Illinois, or where the loess is thicker (40 to 60 inches) than in the northeastern part of association 11. These soils formed in loess and stratified loamy glacial outwash, alluvial terraces, or sandy loam glacial till. They are moderately permeable. The nearly level to strongly sloping Plano soils occur on side slopes, crests of ridges, and wide, nearly level areas with good underdrainage. Elburn soils occur on nearly level and gently sloping parts of the landscape that are usually lower than Plano soils. The poorly drained Drummer soils are on nearly level areas.

The well and moderately well drained Raddle soils form a drainage sequence with the somewhat poorly drained Coffeen soils. These two soils formed in silty alluvium or colluvium typically below steep loess-covered bluffs or on alluvial terraces. They are moderately permeable. Raddle soils are gently sloping or sloping and are commonly located upslope from the nearly level and gently sloping Coffeen soils.

The well and moderately well drained Worthen soils form a drainage sequence with the somewhat poorly drained Littleton soils. These soils are similar to the Raddle and Coffeen soils, but have thicker, dark-colored surfaces. These four soils are most extensive in colluvial positions immediately below the loess bluffs of the Mississippi, Illinois, and, to a lesser extent, the Wabash River valleys. Because most of the sediment is from the thick loess bluff areas, the soils are sometimes referred to as "bluff wash" soils. The Worthen and Littleton soils are moderately permeable and have a dark upper layer more than 24 inches thick. Worthen soils are gently sloping to strongly sloping, and typically occur upslope from the nearly level and gently sloping Littleton soils.

The moderately well drained Prairieville soils form a drainage sequence with the somewhat poorly drained Nachusa soils. These soils formed in loess and loamy material 1 to 3 feet thick on a partially eroded Sangamon paleosol in Illinoian till. They are most extensive in west

Table 11. Characteristics and Productivity Indexes of Soil Association 11 — Plano-Proctor-Worthen Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
443 Barrington	0.7	12	sil	4.0	B	20	sicl-l	Well-mod. well	Moderate	L	M	lo ow.	8.9	0.32	130	108
149 Brenton	0-3	15	sil	4.5	B	33	sicl-cl	SW. poor	Moderate	L	M	lo ow.	11.5	0.28	150	125
136 Brooklyn	0-1	17	sil	3.0	C	36	sicl-sic	Poor	Slow	L	L	lo ow. or till	10.4	0.37	105	82
347 Canisteo	0-2	18	sil-cl	5.0	A	12	cl-sl	Poor	Moderate	L	L	lo ow. or till	10.0	0.28	130	105
428 Coffeen	0-4	13	sil	3.0	B	22	sil	SW. poor	Moderate	M	M	sil-l wash	10.3	0.32	145	118
764 Coyne	0-12	18	fsl	3.0	C	35	fsl-sicl	Well-mod. well	Rapid-mod.	L	L	s and g ow.	9.2	0.20	105	82
152 Drummer	0-2	15	sicl	6.0	A	33	sicl	Poor	Moderate	L	M	lo ow.	11.7	0.28	150	125
198 Elburn	0-5	13	sil	4.5	B	44	sicl	SW. poor	Moderate	L	M	lo ow. or till	11.8	0.28	155	128
67 Harpster	0-2	15	sicl	5.5	A	24	sicl	Poor	Moderate	L	L	lo wash	11.2	0.28	135	110
763 Joslin	0-6	14	sil	4.0	B	45	sil-sic	Well	Mod.-mod. slow	M	M	sil lac	10.6	0.32	130	108
191 Knight	0-2	32	sil	3.5	B	33	sicl	Poor	Mod. slow	L	M	lo ow.	12.4	0.32	120	98
196 Lemond	0-2	15	fsl	4.0	C	18	scl-l	Poor	Mod. rapid	L	L	san. wash	7.6	0.28	110	90
81 Littleton	0-4	26	sil	3.5	B	20	sil	SW. poor	Moderate	M	M	sil-l wash	13.0	0.32	155	128
442 Mundelein	0-5	12	sil	4.5	B	26	sicl	SW. poor	Mod.-mod. slow	L	M	lo ow.	10.1	0.28	135	115
649 Nachusa	0-3	11	sil	3.5	B	44	cl-sicl	SW. poor	Mod.-mod. slow	M	M	cl paleosol	10.2	0.32	145	120
153 Pella	0-2	13	sicl	5.5	A	25	sicl	Poor	Moderate	L	M	lo ow.	11.2	0.28	140	115
199 *Plano*	1-12	12	sil	4.0	B	40	sicl	Well-mod. well	Moderate	M	M	lo ow. or till	11.6	0.32	145	120
650 Prairieville	0-5	12	sil	3.5	B	42	cl-sicl	Mod. well	Mod.-mod. slow	M	M	cl paleosol	10.3	0.32	135	110
148 *Proctor*	0-15	14	sil	3.5	B	35	sicl-cl	Well-mod. well	Mod.-mod. rapid	M	H	lo ow.	11.2	0.32	140	115
430 Raddle	1-8	12	sil	3.0	B	28	sil	Well-mod. well	Moderate	M	M	sil-l wash	12.4	0.32	145	118
206 Thorp	0-1	18	sil	3.5	B	32	sicl	Poor	Slow	L	L	lo ow. or till	11.3	0.37	125	100
197 Troxel	0-2	32	sil	4.0	B	28	sicl	Well-mod. well	Moderate	L	M	lo ow. or till	11.8	0.28	140	118
369 Waupecan	0-7	12	sil	3.5	B	38	sicl-sl	Well-mod. well	Moderate	L	M	gl s-g	8.8	0.32	150	125
37 *Worthen*	1-12	20	sil	3.5	B	25	sil	Well-mod. well	Moderate	M	M	sil-l wash	13.0	0.32	145	120

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

central Lee County and east central Whiteside County. In most areas, the paleosol was only partially eroded during the melting of the Wisconsinan ice, when its terminals stood in southeastern and eastern Lee and Ogle counties. When the volume of water was decreasing during the later stages of the melting of the Wisconsinan ice, erosion of the till surface ceased, and up to 3 feet of loamy material and loess in which the upper part of these soils formed was deposited.

Brooklyn soils are poorly drained and formed in loess or silty material and loamy outwash. They are nearly level or depressional and have a clayey subsoil that is slowly permeable. Harpster soils are nearly level or slightly depressional and occur on outwash and till plains. They are moderately permeable, poorly drained, and highly calcareous throughout. The Lemond soils are similar to Harpster soils but contain more sand and less clay. Canisteo soils are also similar to Harpster soils in many respects. Even though they are calcareous, however, they do not have as severe fertility problems as Harpster soils because they are not as high in lime. Coyne soils are nearly level to sloping and formed in sandy outwash over loamy and moderately fine-textured lacustrine materials on alluvial terraces. These soils occur on terraces in the Mississippi and adjacent Rock and Green River valleys. They are well and moderately well drained. Coyne soils are rapidly permeable in the upper part and moderately permeable in the lower part. Joslin soils, which are associated with Coyne soils, are nearly level and gently sloping. The upper part of Joslin soils formed in loamy material and the lower part in clayey lacustrine sediments. Joslin soils are well drained and moderate to moderately slowly permeable. The nearly level Knight soils are in closed depressions on till plains, outwash plains, and alluvial terraces. They formed in loess and stratified loamy and sandy materials. Knight soils are poorly drained and moderately slowly permeable. Thorp soils are nearly level or depressional and occur on outwash or till plains and stream terraces. These soils formed in loess or silty material and stratified loamy outwash or sandy loam till. Thorp soils are poorly drained and slowly permeable. Troxel soils are nearly level, and occur in depressions or concave positions on loess-covered outwash and till plains. Troxel soils are well and moderately well drained and moderately permeable. The surface layers are over 24 inches thick.

The Waupecan soils are similar to the Plano soils in many respects in the upper part of their profile. In their lower profile, however, the Waupecan soils contain more sand and gravel than the Plano soils.

The major problems with the soils of this association are drainage on wet soils and erosion of sloping soils. Restricted permeability is a problem in a few areas. Most of the wet soils can be drained by tile; open inlets to the tile may be needed in a few places, especially in depressional areas. Erosion control practices are needed on the sloping areas. Most soils in this association are very productive and nearly all are cultivated; corn and soybeans are the principal crops. Various characteristics and the productivity indexes of the soils in association 11 are given in Table 11.

Soil Association 12

Saybrook-Dana-Drummer Soils

Soil association 12 occurs in east central and northeastern Illinois on nearly level to strongly sloping uplands. It covers about 1,228,800 acres or 3.4 percent of the state's land area. In the east central part of the state, where the loess is 40 to 60 inches thick on gently sloping, stable areas, the soils in association 12 occur on the more sloping and morainal areas, where the loess is less than 40 inches thick. These dark-colored prairie soils formed under grass vegetation and are related to the light-colored forest and the moderately dark prairie-forest transition soils of association 42. The parent materials consist of loess less than 40 inches thick and the underlying, medium-textured (loam) Wisconsinan-age glacial till.

Sidell, Dana, and Raub soils comprise one of the three drainage sequences in this association. These soils formed in 20 to 40 inches of loess and the underlying, loam-textured glacial till. They have silty clay loam-textured subsoils, and are leached of carbonates to depths greater than 42 inches. Saybrook and Lisbon soils formed in similar parent materials but are calcareous at depths between 24 and 42 inches. They comprise the second drainage sequence. The poorly drained Drummer soils, which are associated with both of these sequences, are underlain by medium-textured local wash. The third drainage sequence is composed of the well drained Parr, the moderately well drained Corwin and the somewhat poorly drained Odell soils. These soils formed in thinner loess (less than 15 inches), have clay loam-textured subsoils, and are calcareous between 24 and 42 inches. They are most common in northeastern Illinois. Poorly drained Pella soils, which are often associated with Parr, Corwin and Odell soils, have silty clay loam, calcareous subsoils and are underlain by medium textured loamy, local wash or outwash.

The minor soils in this association, among which are LaRose and Ayr, often occur in small, scattered areas. LaRose soils, which are found on the steeper slopes, formed almost entirely from calcareous glacial till. Ayr soils formed in sandy material overlying loam-textured till. LaRose and Ayr have lower available-water holding

Table 12. Characteristics and Productivity Indexes of Soil Association 12 — Saybrook-Dana-Drummer Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
204 Ayr	1-10	20	sl	3.0	C	20	scl	Well	Mod.-mod. rapid	M	M	l till	8.0	0.20	120	98
495 Corwin	0-10	13	sil	4.0	B	18	sicl-cl	Mod. well	Mod.-mod. slow	M	H	l till	9.4	0.28	135	110
56 *Dana*	0-6	14	sil	3.5	B	35	sicl-cl	Mod. well	Mod.-mod. slow	M	H	l till	10.8	0.32	140	115
152 *Drummer*	0-2	15	sicl	6.0	A	33	sicl	Poor	Moderate	L	M	lo wash	11.7	0.28	150	125
60 LaRose	5-30	10	sil	3.0	C	9	cl	Well-mod. well	Moderate	M	M	l till	7.9	0.32	125	100
59 Lisbon	0-3	14	sil	4.5	B	26	sicl-cl	SW. poor	Mod.-mod. slow	M	H	l till	10.9	0.28	155	128
490 Odell	0-6	13	sil	4.5	B	17	sicl-cl	SW. poor	Mod.-mod. slow	M	M	l till	9.4	0.28	145	120
221 Parr	2-18	11	sil	3.5	B	18	sicl-cl	Well	Moderate	M	H	l till	9.2	0.32	130	105
153 Pella	0-2	15	sicl	5.5	A	25	sicl	Poor	Moderate	L	M	lo wash	11.2	0.28	140	115
481 Raub	1-3	13	sil	4.5	B	38	sicl-cl	SW. poor	Mod. slow	M	H	l till	10.9	0.28	155	128
145 *Saybrook*	1-12	13	sil	3.5	B	27	sicl-cl	Mod. well-well	Moderate	M	H	l till	10.5	0.32	140	115
55 Sidell	0-12	11	sil	3.5	B	42	sicl-cl	Well	Moderate	M	H	l till	10.9	0.32	135	110

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 13. Characteristics and Productivity Indexes of Soil Association 13 — Griswold-Ringwood Soils[a]

		Surface soil				Subsoil						Sub-stratum				
										Supply of					Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thick-ness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thick-ness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	High mgmt.	Avg. mgmt.
204 Ayr	1-10	20	sl	3.0	C	20	scl	Well	Mod.-mod. rapid	M	M	l till	8.0	0.20	120	98
363 *Griswold*	2-15	11	l	3.5	C	18	cl-scl	Well	Moderate	M	H	sl till	8.7	0.32	120	95
60 LaRose	5-30	10	sil	3.0	C	9	cl	Well-mod. well	Moderate	M	M	l till	7.9	0.32	125	100
297 *Ringwood*	0-10	15	sil	3.5	C	23	cl	Mod. well-well	Moderate	M	H	sl till	10.2	0.28	130	105

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

capacities than other soils in the association. Soils in association 42 are in general the forested analogues of the soils in association 12.

The available-water holding capacities of soils in association 12 are moderate to high except for the LaRose and Ayr soils, which tend to be droughty. Permeability is generally moderate, and tile function well in poorly drained Drummer and Pella soils. Fertility is moderate to high, and crops respond well to limestone, nitrogen, phosphorus and potassium when the need for applications is indicated by soil tests. Soil erosion is the principal soil management problem because many areas in this association are sloping. Much of the erosion, however, can be controlled with minimum tillage, contouring, terracing, grass waterways, and crop rotation.

In the northern parts of this soil association, where livestock are common, corn, soybeans, oats, legume hay, and pasture are the major crops. Corn and soybeans are the principal crops in the southern part of the association in east central Illinois. Various characteristics and the productivity indexes of the soils in association 12 are given in Table 12.

Soil Association 13

Griswold-Ringwood Soils

Association 13 covers a relatively small area (97,100 acres or 0.3 percent of the state's land area) on the gently to moderately strongly sloping uplands of extreme northern Illinois, mostly in Boone, Henry, and Winnebago counties. It consists of only a few soils. The two major ones, Griswold and Ringwood, formed in calcareous, sandy loam glacial till that is covered by a thin veneer of silt loam loess. These dark-colored, prairie soils formed under grass, and are considered to be the prairie counterparts of the light-colored forest soils of association 43.

Griswold soils are well drained, formed in less than 15 inches of silty material over sandy loam till, and have loam or sandy loam A horizons. The texture of the permeable subsoils is clay loam or sandy clay loam. Ringwood soils are well and moderately well drained, formed in 15 to 30 inches of loess over sandy loam till, and have silt loam A horizons and brownish clay loam subsoils.

The minor soils in this association include LaRose and Ayr, which also occur in soil association 12. The LaRose soils, which occur on knolls and steeper slopes, formed mainly in till. The sandy Ayr soils are underlain by sandy loam till.

The moderately permeable soils in association 13 have moderate available-water holding capacities and are productive. The fertility requirements of these soils are moderate, and crops respond well to limestone, nitrogen, phosphorus and potash applications when the need for these soil amendments is indicated by soil tests. The principal crops grown on these soils are corn, soybeans, oats, legume hay, and pasture.

Soil erosion is the major management problem on the strongly sloping areas, but it can usually be controlled with contouring, grass waterways, terraces, minimum tillage and crop rotation. Various characteristics and the productivity indexes of the soils in association 13 are given in Table 13.

Soil Association 14

Varna-Elliott-Ashkum Soils

Soil association 14 occurs in the upland of northeastern Illinois and occupies 983,100 acres or approximately 2.7 percent of the land area of Illinois. These dark-colored soils developed in a thin layer of loess over silty clay loam till of Wisconsinan age. The loess is generally less than 20 inches thick. The slopes of the major soils in this association range from nearly level to strongly sloping. The soils developed under prairie vegetation consisting mostly of grasses such as bluestem in the genus *Andropogon*.

The Varna-Elliott-Ashkum soils form a catena or drainage sequence of soils on the landscape. The moderately well drained Varna soils are found predominantly on sloping areas but also occur on gently sloping and strongly sloping areas. The somewhat poorly drained Elliott soils occur on nearly level to gently sloping portions of the landscape at slightly higher elevations and are usually adjacent to the Ashkum soils. The poorly drained Ashkum soils occur in the lower, nearly level to depressional portion of the landscape. All three soils are fine textured and have moderately slow permeability.

The Peotone soil, a significant minor soil in this association, occurs as closed depressional areas that are frequently smaller than 1 acre. This dark soil is poorly to very poorly drained and has moderately slow permeability. Where possible, the depressional areas are usually drained by means of surface ditches or surface inlets into tile.

The Wesley series is another minor soil in this association. It developed in 20 to 40 inches of sandy materal over silty clay loam till or silty clay loam to clay loam lacustrine materials. Wesley soils are dark colored and somewhat poorly drained.

The major problems in this soil association are moderately slow permeability, inadequate amounts of phosphorus in the surface soil, and susceptibility to erosion, especially on the sloping Varna soils and the upper range of the gently sloping Elliott soils. Despite their moderately slow permeability, Ashkum and Elliott soils can be drained effectively with tile. These soils are not deeply leached and weathered. Calcareous or limey, unweathered glacial till, which usually occurs at depths of less than 42 inches, tends to restrict root penetration of common farm crops to some extent and accounts for some of the fertility problems and the moderate levels of production on these soils. The rather shallow depth to the limey till makes erosion control especially important on these soils. Various characteristics and the productivity indexes of the soils in association 14 are given in Table 14.

Soil Association 15

Symerton-Andres-Reddick Soils

Soil association 15 occurs in northeastern Illinois, principally in DuPage, Grundy, Iroquois, Kankakee, Livingston, and Will counties. It occupies 175,200 acres or approximately 0.5 percent of the state's land area. These dark-colored soils developed in less than 24 inches of loess on loamy outwash material over silty clay loam till or lacustrine material.

The slopes of the three major soils in this association range from nearly level to sloping. These soils developed under prairie grass native vegetation. Their loess covering varies in thickness from 0 to 24 inches, usually aver-

Table 14. Characteristics and Productivity Indexes of Soil Association 14 — Varna-Elliott-Ashkum Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
232 *Ashkum*	0-3	15	sicl	6.0	A	26	sicl-sic	Poor	Mod. slow	L	H	sicl till	9.6	0.28	135	110
146 *Elliott*	1-3	14	sil	4.5	B	22	sic-sicl	SW. poor	Mod. slow	L	H	sicl till	10.2	0.28	130	102
330 Peotone	0-2	16	sicl	6.0	A	32	sicl	Poor-v. poor	Mod. slow	L	M	sicl till	10.2	0.28	120	100
223 *Varna*	3-12	12	sil	3.5	B	18	sicl-sic	Mod. well-well	Mod. slow	L	M	sicl till	10.0	0.32	125	98
141 Wesley	0-5	13	fsl	3.5	C	30	l-sicl	SW. poor	Mod. rapid-mod. slow	L	M	sicl lac. or till	7.1	0.24	110	88

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 15. Characteristics and Productivity Indexes of Soil Association 15 — Symerton-Andres-Reddick Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
293 *Andres*	0-5	16	sil	4.5	B	30	sicl-cl	SW. poor	Mod.-mod. slow	L	H	sicl till or lac.	11.2	0.28	145	120
594 *Reddick*	0-2	17	sicl	5.5	A	30	cl	Poor	Mod. slow	L	H	sicl-c till or lac.	10.8	0.28	140	115
294 *Symerton*	0-10	15	sil	3.5	B	25	cl	Mod. well-well	Mod.-mod. slow	L	H	sicl till or lac.	9.7	0.32	135	112
141 Wesley	0-5	13	fsl	3.5	C	30	l-sicl	SW. poor	Mod. rapid-mod. slow	L	M	sicl lac. or till	7.1	0.24	110	88

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

aging about 12 inches. The second parent material, loamy outwash, occurs below the surficial loess, and is from 20 to 40 inches thick. The third parent material, silty clay loam till, is 30 to 50 inches below the surface.

The Symerton-Andres-Reddick soils form a drainage sequence of soils on the landscape; that is, they vary in natural drainage class and slope. The well-drained Symerton soils occur on gently sloping to sloping areas. The somewhat poorly drained Andres soils are found on nearly level to gently sloping portions of the landscape and frequently lie adjacent to the Reddick soils. The poorly drained Reddick soils occur in the lower, nearly level to depressional part of the landscape. Andres and Symerton soils have moderate to moderately slow permeability and Reddick soils are moderately slow in permeability.

The minor Wesley soils are also included in this association. They are dark colored and developed from 20 to 40 inches of sandy outwash over silty clay loam till or silty clay loam to clay loam lacustrine materials. The Wesley soils differ from the Andres soils in being more sandy in the surface and subsoil portions of the soil profile. The permeability of the Wesley soils is moderately rapid in the upper 40 inches and moderately slow in the material below.

The major problems with these soils are maintaining normal fertility, providing adequate tile drainage for the Reddick soils, and susceptibility to erosion, especially on the sloping Symerton soils. The soils in association 15 are somewhat thicker to the underlying silty clay loam till or lacustrine material than are the soils of association 14, Varna, Elliott and Ashkum, and as a consequence, are slightly more productive. Various characteristics and the productivity indexes of the soils in association 15 are given in Table 15.

Soil Association 16

Swygert-Bryce-Mokena Soils

Soil association 16 occurs in the upland of northeastern Illinois and occupies 528,400 acres or approximately 1.5 percent of the state's land area. It occurs principally in Vermilion, Champaign, Iroquois, Ford, Livingston, LaSalle, Grundy, and Kendall counties. These dark-colored soils developed under grass in a thin layer of loess (up to 20 inches thick) on silty clay till or lacustrine sediments of Wisconsinan glacial age.

Because Swygert and Bryce, the major soils in this association, form a drainage sequence on the landscape, they vary in drainage class and slope. The somewhat poorly drained Swygert soils occur on nearly level to sloping portions of the landscape at slightly higher elevations than the Bryce soils and usually lie adjacent to them. The poorly drained Bryce soils occur in the lower, nearly level to depressional portion of the landscape. Permeability is slow in the solum surface and subsoil and very slow in the substratum.

Mona, Mokena, and Reddick soils also form a drainage sequence in this association. They developed in thin loess and loamy outwash 30 to 50 inches thick over silty clay or clay till or lacustrine material. They are dark colored, with moderately slow to slow permeability. The more sloping Mona soils are usually moderately well drained but are occasionally well drained. The gently sloping Mokena soils are somewhat poorly drained, and the nearly level Reddick soils are poorly drained. These soils are similar in many respects to the Symerton, Andres, and Reddick soils of association 15. The principal difference between them is that the underlying till or lacustrine material of the soils in association 16 is silty clay or clay rather than silty clay loam.

Table 16. Characteristics and Productivity Indexes of Soil Association 16 — Swygert-Bryce-Mokena Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
235 *Bryce*	0-3	13	sic	6.0	A	25	sic	Poor	Slow	L	M	sic till or lac.	6.3	0.28	120	98
295 *Mokena*	0-5	13	sil	4.5	B	25	cl-sic	SW. poor	Mod. slow-slow	M	H	sic-c till or lac.	9.3	0.28	125	100
448 Mona	0-10	10	sil	4.0	B	25	cl-sic	Well-mod. well	Mod. slow	M	H	sic-c till or lac.	9.0	0.28	115	90
229 Monee	0-2	14	sil	3.0	B	20	sic-c	Poor	V. slow	L	M	sic-c till or lac.	8.7	0.37	90	70
42 Papineau	0-3	13	fsl	3.0	C	24	scl-c	SW. poor	Mod.-slow	L	M	sic-c till or lac.	8.0	0.20	95	75
238 Rantoul	0-1	17	sic	6.0	A	30	sic	Poor-v. poor	V. slow	L	M	sic-c till or lac.	7.5	0.28	100	80
594 Reddick	0-2	17	sicl	5.5	A	30	cl	Poor	Mod. slow	L	H	sicl-c till or lac.	10.8	0.28	140	115
91 *Swygert*	1-7	12	sicl	4.0	A	24	sic	SW. poor	Slow	L	H	sic till or lac.	6.5	0.43	115	90

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 17. Characteristics and Productivity Indexes of Soil Association 17 — Clarence-Rowe Soils[a]

		Surface soil				Subsoil						Sub-stratum				
No. and name of soil series	Slope range, %	Avg. thick-ness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thick-ness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	Productivity index[b] High mgmt.	Productivity index[b] Avg. mgmt.
147 *Clarence*	1-12	11	sicl	3.5	A	20	c	SW. poor	V. slow	L	H	c till or lac.	5.4	0.28	105	80
295 Mokena	0-5	13	sil	4.5	B	25	cl-sic	SW. poor	Mod. slow-slow	M	H	c-sic till or lac.	9.3	0.28	125	100
448 Mona	0-10	10	sil	4.0	B	25	cl-sic	Well-mod. well	Mod. slow	M	H	c-sic till or lac.	9.0	0.28	115	90
229 Monee	0-2	14	sil	3.0	B	20	c-sic	Poor	V. slow	L	M	c-sic till or lac.	8.7	0.37	90	70
42 Papineau	0-3	13	fsl	3.0	C	24	scl-c	SW. poor	Mod.-slow	L	M	c-sic till or lac.	8.0	0.20	95	75
238 Rantoul	0-1	17	sic	6.0	A	30	sic	Poor-v. poor	V. slow	L	M	c-sic till or lac.	7.5	0.28	100	80
594 Reddick	0-2	17	sicl	5.5	A	30	cl	Poor	Mod. slow	L	H	sicl-c till or lac.	10.8	0.28	140	115
230 *Rowe*	0-2	14	sic	5.0	A	18	c	Poor	V. slow	L	M	c till or lac.	5.4	0.28	110	85

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Other minor soils in this association are Rantoul, Monee, and Papineau. The Rantoul soils are dark and very poorly drained and occur in closed depressions that are frequently smaller than 1 acre. These very slowly permeable soils can often be drained satisfactorily with open tile inlets. Monee soils, which cover only a very small area, are moderately dark colored to light colored and poorly drained, with very slow permeability. They are less extensive in this soil association than in soil association 17, occurring most frequently in very slight depressions in the upland portion of the landscape. The Papineau soils, which also cover a relatively small area, developed in 20 to 40 inches of loamy material over silty clay or clay till or lacustrine material. They are dark colored and somewhat poorly drained, with moderately slow permeability in the upper loamy part of the profile and very slow permeability in the lower part.

The major problem in this soil association is slow permeability, which limits the usefulness of tile and inhibits erosion control on the sloping Swygert and Mona soils. On the Rantoul and Monee soils, depressions can be drained by means of open tile drains. On the poorly drained Bryce soils, however, tile drains are of questionable value because they must often be spaced too close together to be economical. Erosion control measures such as terracing are difficult to apply to soils in this association because short slopes and depressions are often intermingled on the landscape. However, erosion can be controlled by means of conservation tillage. Because of the shallow depth to the unweathered, calcareous till, rooting of farm crops such as corn and soybeans is restricted and yield reductions are common, especially in dry years. Another result of the shallow depth to unweathered till is that yield reductions caused by erosion are greater and are more permanent than on more permeable soils.

Various characteristics and the productivity indexes of the soils in association 16 are given in Table 16.

Soil Association 17

Clarence-Rowe Soils

Soil association 17 occurs in the upland of northeastern Illinois and occupies 116,200 acres or 0.3 percent of the state's land area of the state. This association occurs principally in Vermilion, Ford, Iroquois, and Livingston counties. The soils are dark colored and developed under grass in less than 20 inches of loess on clay till or lacustrine sediments of Wisconsinan glacial age.

The Clarence and Rowe soils form a drainage sequence. The somewhat poorly drained Clarence soils occur on nearly level to sloping parts of the landscape at slightly higher elevations and are usually adjacent to the Rowe soils. The poorly drained Rowe soils occur on nearly level to occasionally depressional portions of the landscape. Permeability is very slow in both soils.

Mona, Mokena, and Reddick soils are developed in thin loess and loamy outwash 30 to 50 inches thick over silty clay or clay till or over lacustrine material. Mona soils, which are moderately well drained and well drained, occur on the more sloping areas. Mokena soils are somewhat poorly drained and occur on gentle slopes. Poorly drained Reddick soils are nearly level and have moderately slow to slow permeability. Their underlying material (silty clay or clay) is finer textured than that of the Symerton and Andres soils of association 15.

Other soils in association 17 that cover fairly small areas are Monee, Rantoul, and Papineau. The Rantoul soils are dark and very poorly drained, and are usually found in closed depressions that are frequently smaller than 1 acre. These very slowly permeable soils can often be drained satisfactorily with open tile inlets. Monee soils are moderately dark to light colored and poorly drained, with very slow permeability. These soils occur most frequently in slight depressions. The Papineau soils in association 17 are developed in 20 to 40 inches of loamy material over clay till or lacustrine material. They are dark colored and somewhat poorly drained, with moderately slow permeability in the upper loamy part of the profile and very slow permeability in the lower part.

A major problem in this soil association is slow to very slow permeability. It severely limits the use of tile in most of the soils (except Mona, which does not require drainage) and hinders erosion control on the sloping Clarence and Mona soils. Tile do not function adequately in Rowe and Clarence soils, but depressions of Rantoul and Monee soils can be drained with open tile inlets. Erosion control measures such as terracing are difficult to apply to soils in this association because short slopes and depressions are often intermingled on the landscape. However, erosion can be controlled through conservation tillage. Because of the shallow depths to the unweathered clay till, the rooting depth of crops such as corn and soybeans is severely restricted and yields are modest even in years of good weather. Erosion further reduces the depth to the unweathered clay till, greatly decreasing crop yields. It is difficult to renovate or reclaim the severely eroded areas because of the unfavorable nature of the underlying clay till or lacustrine material. Various characteristics and the productivity indexes of the soils in association 17 are given in Table 17.

Soil Association 18

Harco-Patton-Montgomery Soils

Soil association 18 occurs in southeastern Illinois, primarily in the counties along the Wabash River. Most areas of these soils are relatively small; they occupy about 111,000 acres or 0.3 percent of the state's land area. These dark-colored soils developed mainly in silty and clayey lacustrine (lakebed) sediments. A thin loess cover is present in some areas. The sediments were deposited for the most part in side valleys along the Wabash River valley during the melting of the Wisconsinan glaciers, which extended only into the upper reaches of the Wabash River watershed. The melting of the Wisconsinan ice caused extreme flooding in the Wabash River valley, backing up water as much as 30 to 40 miles into some of the side valleys. After the glacial meltwaters receded, the side streams reestablished their channels, and their bottomlands were cut down in the lacustrine deposits, leaving the lakebed areas as terraces or benches intermediate in elevation between the uplands and bottomlands.

Before being cultivated, these soils had grass or a swamp-type cover of mixed grass and trees, especially in the low-lying, poorly drained areas. The trees did not produce light-colored surface soils. Most areas of this association are nearly level, and are often intermingled with or near the light-colored, forested soils of soil association 46.

Harcon and Patton soils are moderately permeable, and can be drained effectively by tiling systems if suitable outlets are available. Deep ditches are often used for tile outlets. These two highly productive soils are commonly planted in corn, soybeans, or wheat. The main problems with them are drainage and maintenance of fertility, neither of which is difficult to solve. Montgomery soils are finer textured than Harco and Patton. They are slowly to very slowly permeable, and usually must be drained by means of open ditches; tile do not function adequately in them unless spaced unusually close. Montgomery soils are moderately productive under a high level of management.

Because the soils in this association are nearly level, they seldom have erosion problems. They respond to good management, and the Harco and Patton soils are among the most productive in the southern part of the state. Various characteristics and the productivity indexes of the soils in association 18 are given in Table 18.

Soil Association 19

Martinton-Milford Soils

Soil association 19 occurs mainly in east central and northeastern Illinois; there are a few areas in northwestern Illinois in the Green River lowlands, especially in northern Henry County. Most areas are located in old glacial lakebeds formed by glacial moraines or other obstructions to natural drainage such as valley fills. This association occupies about 338,600 acres or 1.0 percent of the state's land area. The largest areas of these lacustrine soils occur in Douglas, Iroquois, eastern Cook, and northern Henry counties.

With the exception of Coyne, which is in part sandy, these soils formed in lacustrine sediments of silt loam, silty clay loam, silty clay, or clay texture. A thin loess cover is present in some areas. The substratum layers are generally lower in clay and higher in sand and silt than the subsoils. However, the very fine-textured Aholt and Booker soils, which are most extensive in northern Henry County, are usually very high in clay throughout their profiles. All of these soils formed under grass and are

Table 18. Characteristics and Productivity Indexes of Soil Association 18 — Harco-Patton-Montgomery Soils[a]

	Surface soil					Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
484 *Harco*	0-3	14	sil	4.0	B	25	sicl	SW. poor	Moderate	L	M	sil lac.	12.4	0.32	150	125
465 *Montgomery*	0-1	15	sic-sicl	4.0	A	23	sic	Poor	Slow-v. slow	L	M	sicl-sic lac.	10.0	0.37	115	92
142 *Patton*	0-2	15	sicl	4.0	A	22	sicl	Poor	Mod.-mod. slow	L	M	sicl-sil lac.	12.1	0.28	145	120

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 19. Characteristics and Productivity Indexes of Soil Association 19 — Martinton-Milford Soils[a]

	Surface soil					Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
670 Aholt	0-2	16	sic-c	4.0	A	35	sic-c	Poor	Very slow	L	M	sicl-c lac.	6.4	0.28	75	60
457 Booker	0-2	16	sic-c	4.0	A	30	sic-c	Poor-v. poor	Very slow	L	M	sicl-c lac.	6.3	0.28	80	65
764 Coyne	0-12	18	fsl	3.0	C	35	fsl-sicl	Well-mod. well	Rapid-Mod.	L	L	s & g ow.	9.2	0.20	105	82
262 Denrock	0-2	13	sil	4.0	B	35	sic-cl	SW. poor	V. slow-mod. slow	H	M	sl-s ow.	9.2	0.37	110	88
763 Joslin	0-6	14	sil	4.0	B	45	sil-sic	Well	Mod.-mod. slow	M	M	sil lac.	10.6	0.32	130	108
189 *Martinton*	0-5	15	sil-sicl	4.5	B	30	sicl-sic	SW. poor	Mod. slow	L	M	sil-sicl lac.	10.7	0.32	135	110
69 *Milford*	0-2	16	sicl	5.5	A	30	sicl-sic	Poor	Mod. slow	L	M	sicl-cl lac.	9.9	0.28	135	112
465 Montgomery	0-1	15	sic-sicl	4.0	A	23	sic	Poor	Slow-v. slow	L	M	sicl-sic lac.	10.0	0.37	115	92
141 Wesley	0-5	13	fsl	3.5	C	30	l-sicl	SW. poor	Mod. rapid-mod. slow	L	M	sicl lac. or till	7.1	0.24	110	88

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

dark colored. The light-colored, forest soil counterparts of these soils are in association 46.

Most of the soils in this association are nearly level. The larger lake plains often appear as wide, flat expanses. The sandy Coyne and the silty Joslin and Denrock soils, which contain sandy and silty outwash layers as well as heavier lacustrine horizons, occur on low ridges in the lake plain.

The major problems on all of these soils except the Coyne and Joslin are drainage and maintenance of fertility. The Coyne and Joslin soils do not require drainage improvement, and are often subject to erosion, especially on their more sloping portions. The somewhat poorly drained Martinton and the poorly drained Milford soils, which are extensive on many of the nearly flat lakebeds, can be tile drained, although tile draw a bit slowly in these soils. Areas of these soils are often traversed by deep ditches that serve as tile outlets. The Aholt, Booker, Montgomery, and Denrock soils are too heavy textured and too impermeable in their subsoils to be tiled satisfactorily. Where suitable grades can be developed, these soils are commonly drained by shallow open ditches emptying into deeper ditches.

Improvement and maintenance of the fertility of these soils should be based upon soil tests. Fertility requirements for good crop yields are moderate, although phosphorus supplying power is generally low. Many areas of these soils are fall plowed, especially the flatter areas that tend to be wet in the spring. In general, these soils are moderately to highly productive under high management. Corn and soybeans are the main crops grown in this soil association. Various characteristics and the productivity indexes of the soils in association 19 are given in Table 19.

Soil Association 20

Lorenzo-Warsaw-Wea Soils

Soil association 20 occurs primarily on stream terraces or outwash areas along the state's major streams, which carried the meltwaters of the Wisconsinan glaciers as they receded from northeastern Illinois. In the Rock River watershed, the main areas of these soils occur in Winnebago, Boone, Ogle, and western McHenry counties. In the Fox River drainage, they are most extensive in eastern McHenry, northwestern Cook, western DuPage, and Kane counties. Several large areas are located in western Will County between the DuPage and the Des Plaines rivers. In the Illinois River valley, the larger areas occur in Marshall and Putnam counties. The other major areas lie in the Wabash River valley in Lawrence, Crawford, and Clark counties. Some of these soils also occur along many smaller streams such as Sugar Creek in southeastern Iroquois County. This association occupies 237,500 acres or 0.7 percent of the state's land area.

The soils of association 20 are dark colored and formed under grass in thin loamy or silty materials on sandy and gravelly outwash deposits. The light-colored forest soils that formed in materials similar to the ones in which these soils formed are in association 48. In most of the soils in association 20, the depth to the loose sand and gravel ranges from 20 to 40 inches. In a few, however, such as the Rodman, Stockland, Burkhardt, Saude, and Lorenzo soils, the loose sand and gravel occur at shallower depths of about 20 inches. In the Wea, Crane, and Westland soils, the depth to sand and gravel is somewhat more than 40 inches.

Most of these soils have moderately to moderately rapidly permeable subsoils and are well or excessively drained. However, a few, such as the Fieldon, Marshan, Westland, and Will soils, are poorly drained largely because they occur in low areas that have high water tables and not because of slowly permeable subsoils. In these naturally poorly drained areas, water tables are often lowered by means of open ditches. Water-table management is feasible in some areas of this association. During early spring, ditches are left open for drainage of low areas. Later in the season, as regional water tables drop, the ditches are closed off by gates to slow the rate at which the water table is lowered.

The soils in this association generally have only moderate to low water-holding capacity in the upper loamy materials and very low capacity in the underlying sand and gravel. The more sandy soils' rather low capacity to hold plant nutrients often makes it necessary to add fertilizer to meet the immediate needs of the growing crop. Another consequence of these soils' low clay content, their attendant relatively low nutrient and water-holding capacities, and their moderate to rapid permeability is that the groundwater of these soils may well become polluted if they are used for waste disposal — as septic tank absorption fields, for example.

Table 20. Characteristics and Productivity Indexes of Soil Association 20 — Lorenzo-Warsaw-Wea Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
961 Burkhardt	0-30	10	sl	3.0	C	10	sl-l	Well	Mod. rapid-rapid	M	M	sand g ow.	4.1	0.20	75	60
286 Carmi	0-12	16	sl	2.5	C	32	sl-l	Well	Mod. rapid-rapid	M	M	sand g ow.	7.7	0.20	105	88
609 Crane	0-3	12	sil	4.0	B	45	sicl-cl	SW. poor	Mod. slow-mod.	M	M	sand g ow.	10.8	0.32	140	118
379 Dakota	0-18	10	l	2.5	C	30	l-sl	Well	Mod.-mod. rapid	M	M	sand g ow.	7.6	0.28	110	90
380 Fieldon	0-1	14	l	4.0	C	20	fsl-vfsl	Poor	Mod.-mod. rapid	L	L	sand g ow.	6.9	0.28	85	68
783 Flagler	0-9	18	sl	2.5	C	22	sl	Well	Mod. rapid-rapid	M	M	sand g ow.	5.6	0.20	90	72
354 Hononegah	0-25	18	s	2.0	D	18	s	Well	Very rapid	M	M	sand g ow.	2.3	0.15	75	60
343 Kane	0-3	14	sil	4.0	B	24	sicl-cl	SW. poor	Mod.-rapid	M	M	sand g ow.	8.2	0.28	125	102
647 Lawler	0-5	16	l	3.5	C	26	l-scl	SW. poor	Mod.-rapid	M	M	sand g ow.	7.9	0.28	115	95
318 *Lorenzo*	1-12	8	l	3.0	C	8	l-cl	Well	Mod. rapid-rapid	M	M	sand g ow.	4.4	0.28	90	75
772 Marshan	0-2	14	l	5.0	C	26	sicl-cl	Poor	Mod.-rapid	L	L	sand g ow.	8.2	0.28	110	95
289 Omaha	0-2	15	l	4.0	C	32	l	SW. poor	Mod.-mod. rapid	M	M	sand g ow.	8.7	0.28	120	100
93 Rodman	12-40	7	gl, l	3.0	D	6	gl, l	Well	Mod. rapid-v. rapid	L	L	sand g ow.	2.7	0.20	60	45
774 Saude	1-9	13	l	4.0	C	20	sl-l	Well	Mod.-rapid	M	M	sand g ow.	6.5	0.28	105	80
155 Stockland	0-15	14	sl	2.5	C	30	sl	Well	Mod. rapid-rapid	M	M	sand g ow.	6.0	0.20	85	68
290 *Warsaw*	0-12	14	sil	3.0	B	20	sicl-cl	Well	Mod.-mod. rapid	M	M	sand g ow.	7.6	0.28	120	100
727 Waukee	1-9	14	l	3.0	C	26	l-scl	Well	Mod.-rapid	M	M	sand g ow.	7.4	0.24	105	85
398 *Wea*	1-6	13	sil	3.0	B	45	sicl-cl	Well	Mod.-mod. rapid	M	M	sand g ow.	11.2	0.32	140	118
300 Westland	0-2	12	cl	5.5	B	42	cl-sicl	Poor	Mod.-mod. rapid	M	L	sand g ow.	10.1	0.28	130	108
329 Will	0-3	12	cl	5.5	B	23	cl-sicl	Poor	Mod.-mod. rapid	L	L	sand g ow.	7.2	0.28	120	102

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 21. Characteristics and Productivity Indexes of Soil Association 21 — Jasper-LaHogue-Selma Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
188 Beardstown	0-5	12	l	3.0	C	36	cl-scl	SW. poor	Mod.-mod. slow	M	M	sl-ls ow.	10.2	0.32	115	95
740 Darroch	0-3	13	sil	3.5	B	24	l-cl	SW. poor	Mod. slow	M	M	sl-s ow.	10.6	0.32	145	120
781 Friesland	0-12	16	sl	3.5	C	29	fsl-sil	Well-mod. well	Moderate	M	M	sl-sil till	10.6	0.24	120	98
440 *Jasper*	0-15	14	sil	3.0	B	30	fsl-scl	Well	Moderate	M	M	sl-scl ow.	10.1	0.28	135	110
102 *LaHogue*	0-5	15	l	3.5	C	32	scl-sl	SW. poor	Mod.-mod. rapid	M	M	sl-s ow.	9.9	0.28	130	105
187 Milroy	0-2	16	sl	3.0	D	20	sl-cl	Poor	Mod. slow-slow	L	L	sl-ls ow.	8.4	0.24	95	75
200 Orio	0-2	18	sl	1.5	D	24	scl-cl	Poor	Moderate	L	L	sl-ls ow.	9.0	0.24	110	92
125 *Selma*	0-2	16	l	5.0	C	29	l-cl	Poor	Moderate	L	M	sl-sil ow.	10.8	0.28	135	110
765 Trempealeau	0-2	11	sil	3.0	B	18	sl-fsl	Well	Mod.-mod. rapid	M	M	ls-s ow.	7.1	0.28	105	82

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Most of these soils are gently to moderately sloping. Because they have good water infiltration, they are usually not severely eroded. The more sandy soils may be subjected to some wind erosion if left without vegetative cover in early spring. The steeper slopes are frequently kept in pasture.

Corn, soybeans, and wheat are the major crops grown in soil association 20. Wheat yields are better than those of corn and soybeans because wheat does not grow during the normally dry months of July and August. In many areas of this soil association, crop production can be improved by deep-well irrigation. Where the sand and gravel deposits underlying these soils are thick, the deposits are often good aquifers or sources of water for irrigation. With irrigation, many of these loamy soils have very high potential for vegetable crop production. Various characteristics and the productivity indexes of the soils in association 20 are given in Table 20.

Soil Association 21

Jasper-LaHogue-Selma Soils

Soil association 21 occurs primarily in northeastern Illinois and in the Rock and Green River valleys in the northern and northwestern parts of the state. A few areas are located in the Illinois and Wabash River valleys. This association occupies 443,700 acres or 1.2 percent of the state's land area. The dark-colored soils of this association developed under grass in thin silty and loamy materials on sandy Wisconsinan age outwash. Like the soils in association 11, they occur on outwash plains and stream terraces. Because loess had less influence on these soils, however, they are more sandy and less silty than the soils in association 11.

The Jasper, Darroch, and Selma soils form a drainage sequence and, along with the LaHogue soils, are among the major soils of the association. The Jasper soils are well drained, the Darroch soils are somewhat poorly drained, and the Selma soils are poorly drained. These soils may have a thin (less than 20 inches) surface layer of loess, and are often silty in their uppermost horizons. The somewhat poorly drained LaHogue soils are loamy throughout their profiles.

The minor soils in this association are more scattered than the major soils. The Beardstown, Milroy, and Orio soils show some evidence of degradation in their development by having light-colored, bleached subsurface layers between their dark or moderately dark-colored surface soils and their subsoils. Friesland soils are well drained or moderately well-drained, and are underlain by sandy loam or silt loam till. The Trempealeau soils normally have a silt loam surface but are sandy and drouthy below a depth of about 2 feet.

The major soils of this association have moderate water-holding capacities and are moderately productive. The main problems with these soils are maintenance of fertility and organic matter and erosion control on the more sloping areas. The minor soils vary considerably in water-holding capacity and productivity and have many of the same problems as the major soils. On many of the minor soils, drouth stress reduces the yield of corn and soybeans during most years in which rainfall is less than average. However, quite a number of those areas of association 21 where the outwash is several tens of feet thick are good aquifers, and thus good sources of water for irrigation. In many areas, the number of acres under irrigation has increased considerably in recent years. As in association 20, many areas in this association where irrigation is feasible have a strong potential for vegetable crop production. Various characteristics and the productivity indexes of the soils in association 21 are given in Table 21.

Soil Association 22

Sparta-Dickinson-Onarga Soils

Soil association 22 occurs in many counties in the central and northern parts of Illinois in areas where very sandy materials have been deposited either by wind or water. Most areas are associated with rivers or streams or glacial outwash plains that had a very high concentration of glacial meltwaters. This association has a total area of 761,000 acres or 2.1 percent of the state's land area.

The soils in this association formed in sandy glacial outwash, sandy alluvium, or aeolian sand, and are mainly sands, loamy sands, and sandy loams. These nearly level to moderately steep soils occur on terraces and uplands. They are dark colored, having developed primarily under prairie. The native vegetation of the poorly drained and very poorly drained soils was probably marsh grasses and some water-tolerant trees. These soils are often located near those of association 50, and are considered to be the dark-colored, prairie counterparts of the light-colored sandy soils of association 50.

These soils typically have moderate to low available-water holding capacity. However, a few of the soils that have thick loamy surfaces or thick loam or clay loam strata in the substratum have good available-water holding capacity. The permeability of the soils in this association is rapid or very rapid in the subsoil or substratum. The surface runoff is typically slow or very slow, although some of the strongly sloping or moderately steep areas have medium runoff. The Ade, Dickinson, Onarga, and Sparta soils are nearly level to moderately steep and formed in aeolian sand and sandy loam. These soils range from excessively drained to moderately well drained, and the depth to the water table is greater than 6 feet. Some nearly level Onarga soils are formed in sandy alluvium and flood on rare occasions. Some areas of the Onarga soils in Carroll County have a dark reddish brown clay loam subsoil. Some areas of the Dickinson soils in Ogle County have a loamy glacial till substratum. The nearly level to gently sloping Disco and Lomax soils are formed in sandy alluvium. They are similar to the Dickinson soils but have a thicker, dark-colored surface layer. The nearly level, gently sloping, somewhat poorly drained Hoopeston, Ridgeville, and Watseka soils formed in sandy alluvium or glacial outwash. The depth to a seasonal water table in these soils is 1 to 3 feet in the spring. The nearly level, poorly drained and very poorly drained Gilford, Granby, and Maumee soils formed in sandy alluvium or glacial outwash. A seasonal water table is at or near the surface of these soils during the spring, sometimes causing them to pond water.

The soils in this association are drouthy during the late summer when rainfall is normal or below normal.

Table 22. Characteristics and Productivity Indexes of Soil Association 22 — Sparta-Dickinson-Onarga Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
98 Ade	1-7	19	lfs	1.5	D	35	fs	Well	Rapid	L	L	fs ow. & aeolian	5.0	0.17	90	72
87 *Dickinson*	1-15	15	sl	3.0	C	35	fsl-ls	Well	Mod. rapid-rapid	L	L	s ow. & aeolian	5.8	0.20	105	82
742 Dickinson, loamy sub.	1-12	16	sl	3.0	C	25	sl-ls	Well	Rapid-mod.	L	L	l till	8.3	0.20	110	88
266 Disco	0-5	29	sl	3.0	C	19	sl-ls	Well	Mod. rapid-rapid	L	L	s ow. & aeolian	6.4	0.24	105	85
201 Gilford	0-2	12	fsl	4.5	C	22	fsl-sl	Poor	Mod. rapid-rapid	L	L	ls-s ow. & aeolian	6.5	0.20	110	90
513 Granby	0-2	10	lfs	2.0	D	22	s	Poor	Rapid	L	L	s ow. & aeolian	4.8	0.17	90	75
172 Hoopeston	0-2	18	sl	2.5	C	14	sl	SW. poor	Mod. rapid-rapid	M	L	ls-s ow. & aeolian	6.6	0.28	105	85
265 Lomax	0-5	28	l	3.0	C	22	sl	Well	Mod. rapid	L	M	s ow. & aeolian	9.3	0.28	110	90
89 Maumee	0-1	21	lfs	4.5	D	10	s	Poor	Rapid	L	L	s ow. & aeolian	4.6	0.17	105	82
150 *Onarga*	0-10	16	fsl	3.0	C	29	l-sl	Well-mod. well	Mod.-mod. rapid	M	L	ls-s ow. & aeolian	8.6	0.20	110	88
673 Onarga, red subs.	0-4	22	fsl	3.0	C	30	l-sl	Well-mod. well	Mod.-mod. rapid	M	L	ls & cl ow. & aeolian	9.4	0.20	100	80
151 Ridgeville	0-5	16	fsl	3.0	C	31	fsl-ls	SW. poor	Mod.-rapid	L	L	ls-s ow. & aeolian	8.8	0.20	120	98
88 *Sparta*	0-12	15	ls	2.0	D	19	s-fs	Well	Rapid	L	L	s ow. & aeolian	4.3	0.17	85	68
49 Watseka	0-3	10	lfs	2.0	D	22	s-fs	SW. poor	Rapid	L	L	s ow. & aeolian	4.8	0.17	95	75

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 23. Characteristics and Productivity Indexes of Soil Association 23 — Channahon-Dodgeville-Ashdale Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
411 *Ashdale*	2-20	15	sil	4.0	B	35	sicl	Well	Moderate	H	H	thin resi. on lims.	10.6	0.32	115	95
661 Atkinson	2-20	13	l	3.0	C	26	cl	Well	Moderate	M	M	thin resi. on lims.	8.0	0.28	120	98
493 Bonfield	0-5	14	l	4.0	C	9	l-cb sl	SW. poorly	Mod.-mod. rapid	M	M	cb sl on cb lims.	4.8	0.24	120	98
315 *Channahon*	1-25	8	sil	2.5	B	10	sicl	Well-mod. well	Moderate	L	L	limestone	3.6	0.37	80	62
40 *Dodgeville*	0-30	13	sil	4.0	B	15	sicl	Well	Mod.-mod. slow	M	M	thick c resi. on lims.	6.9	0.32	105	85
769 Edmund	2-35	10	sil	4.0	B	6	sic	Well	Mod. slow	L	L	thin resi. on lims.	3.4	0.37	90	72
516 Faxon	0-2	15	cl	4.0	B	19	l-fsl	Poor	Moderate	L	L	limestone	6.1	0.28	110	88
506 Hitt	1-12	12	sil	4.0	B	38	sicl-cl	Well	Moderate	M	M	thin resi. on lims.	10.1	0.32	110	90
314 Joliet	0-4	12	sicl	4.5	A	7	sicl	Poor	Moderate	L	M	limestone	3.5	0.28	90	70
494 Kankakee	0-12	9	fsl	3.5	C	18	sl-cb sl	Well-mod. well	Mod.-mod. rapid	M	L	cb sl on cb lims.	4.0	0.20	115	98
317 Millsdale	0-2	9	sicl	5.0	A	24	c-cl	Poor	Mod. slow	L	M	thin resi. on lims.	5.7	0.32	115	92
240 Plattville	1-5	14	sil	4.0	B	30	l-cl	Well-mod. well	Moderate	M	M	limestone	8.2	0.32	120	98
324 Ripon	1-12	11	sil	4.0	B	23	sicl-cl	Well	Moderate	M	M	thin resi. on lims.	7.4	0.32	110	90
503 Rockton	0-25	12	l	4.0	C	20	l-scl	Well	Moderate	M	M	thin resi. on lims.	6.6	0.28	105	85
316 Romeo	0-4	6	sil	4.0	B	0	limestone	Poor	Mod. above br.	L	L	limestone	1.3	0.37	30	22
508 Selma, br. sub.	0-6	15	l	5.0	C	25	l-cl	Poor	Moderate	L	M	limestone	7.4	0.28	125	105
504 Sogn	0-15	9	sil	3.0	B	0	limestone	Well	Mod. above br.	L	L	limestone	1.7	0.32	50	40

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Subsurface drainage will allow earlier planting on the poorly drained and very poorly drained soils but may increase the drouth hazard in late summer. In some areas, the depth of the water table is regulated by means of open ditches with gates that can be opened or closed to regulate the rate of water removal. The sloping areas of some of these soils are susceptible to erosion. In many areas, wind erosion occurs in the spring when the soil surface is unprotected. Fall plowing or tillage should be avoided on these soils; make every effort to keep a vegetative cover on them as long as possible. These soils are poor filters for sewage disposal systems because their subsoils have a relatively low amount of clay. Their moderately rapid or rapid permeability can easily lead to contamination of water supplies. Another result of their low clay content is that they do not hold plant nutrients well. For this reason, the fertility programs for these soils usually must be adjusted to the crop being grown; otherwise, nutrients will be leached down and out of reach of plant roots.

Most areas of these soils are used for cultivated crops. Some areas are irrigated, and are quite often excellent sources of irrigation water. Some of the more sloping areas are used for pasture; a few areas are used for growing Christmas trees. The soils in this association respond well to good management. Various characteristics and the productivity indexes of soils in association 22 are given in Table 22.

Soil Association 23

Channahon-Dodgeville-Ashdale Soils

Soil association 23 occurs primarily in two areas of northern Illinois; one is in Stephenson, Winnebago, Ogle, and Lee counties; the other in Cook, DuPage, Grundy, Kankakee, Kendall, and Will counties. A few areas of these soils occur in other counties, but most of them are too small to be shown on the General Soil Map. This association occupies about 197,100 acres or 0.6 percent of the state's land area.

The dark-colored soils of association 23 formed under grass in silty or loamy material that is underlain by limestone or clayey residuum weathered from limestone at depths ranging from less than 10 inches to as much as 60 inches. In some areas the residuum is quite thick (greater than 60 inches), but in others it is entirely absent because of erosion or glacial scouring. Most of the soils are well drained and have moderate permeability, although a few in low-lying areas are poorly drained. The amount of available water in these soils varies, depending upon the texture of the upper silty or loamy material and the depth to limestone bedrock.

The soils of this association in which the limestone is generally less than 20 inches deep are used mainly for pasture. A few are essentially unused wasteland. Some fairly level areas that have 20 to 40 inches of permeable material above limestone are cropped, but yields on these soils are usually low because of drouthiness. Areas with limestone at depths greater than 40 inches have moderate water-holding capacity and are moderately productive for corn and soybeans.

Because many areas of the better drained soils in this association are sloping, they are subject to erosion unless proper conservation practices are used in the cropping and land use systems. Erosion is especially damaging on the thinner soils because it permanently reduces the water-holding capacity of the soil above the limestone. Various characteristics and the productivity indexes of the soils in association 23 are given in Table 23.

Soil Association 24

Lawson-Sawmill-Darwin Soils

Soil association 24 occurs in all of the major floodplains of the state, as well as in the medium and minor floodplains that drain areas of dark-colored soils. It is one of the most widespread associations in the state, and has a total area of about 2,326,100 acres or 6.5 percent of the state's land area.

These soils formed in stratified clayey to sandy alluvium under prairie grasses or deciduous forest. The soils that formed under forest have not had sufficient time to develop light-colored surfaces. All of the surfaces are dark or moderately dark-colored, and a few have sandy textures. Most of these soils are nearly level, but some are gently sloping. A few occur on the more sloping edges of older meander banks or breaks from one floodplain level to another.

The well and moderately well drained Huntsville soils form a drainage sequence with the somewhat poorly drained Lawson soils and the poorly drained Otter soils. All of these soils formed in silty materials, are moderately permeable, and have very thick, dark surface soils. Huntsville soils occur on nearly level to gently sloping ridges and natural levees. Otter soils are located in slight depressions, and Lawson soils occupy intermediate positions of the floodplain. The well drained and moderately well drained Allison soils form a drainage sequence with the poorly drained Sawmill soils. These soils are moderately permeable and formed in moderately fine-textured soil materials. Their dark surface is more than 24 inches thick. The nearly level Sawmill soils occur in the lower parts of the floodplain, and the nearly level and gently sloping Allison soils are found in the higher parts.

Riley soils are nearly level to sloping and somewhat poorly drained. They occur on low, narrow-to-broad ridges in the floodplain. These soils formed in moderately fine-textured to sandy soil materials and are moderately to rapidly permeable. Darwin soils are poor and very poorly drained; they are nearly level or occur in shallow depressions. These soils formed in clayey soil materials and are very slowly permeable.

The well and moderately well drained Armiesburg soils form a drainage sequence with the somewhat poorly drained Tice soils and the poorly drained Beaucoup soils. These soils formed in moderately fine-textured soil materials and are moderately permeable. Armiesburg soils occur in the higher parts of the floodplain, Beaucoup soils in the lower parts, and Tice soils in intermediate positions. The well drained and moderately well drained DuPage soils form a drainage sequence with the poorly drained Millington soils. These soils formed in silty to moderately fine textured calcareous soil materials and are moderately permeable.

Ambraw soils are poorly drained and moderately to moderately slowly permeable. They formed in silty and moderately fine-textured soil materials over sandy soil materials. Ambraw soils occur on nearly level or depressional parts of the floodplain, and are closely related to the moderately well drained Medway soils. Blackoar soils are poorly drained and moderately permeable and formed in silty soil materials. They occur on nearly level or gently sloping parts of the floodplain and are closely related to the well-drained Huntington soils.

The very poorly drained Booker soils are very slowly permeable. They formed in very clayey soil materials and are nearly level or depressional. Booker soils also occur in some lakebed areas as in association 19. Bowdre soils are somewhat poorly drained. They formed in clayey over silty or sandy soil materials. These soils occur on nearly level to sloping parts of the floodplain. They are slowly permeable in the upper part and moderately permeable in the lower part.

Cairo soils are located on nearly level to gently sloping parts of the floodplain. They formed in clayey soil material over sandy soil material. These soils are very slowly permeable in the upper part and rapidly permeable in the lower part and are poorly drained. Calco soils are nearly level and poor to very poorly drained. They formed in calcareous, moderately fine-textured, soil materials and are moderately slowly permeable. The poorly drained Colo soils are moderately slowly permeable. They formed in moderately fine-textured soil material, occur on nearly level parts of the floodplain, and have a dark surface more than 40 inches thick.

Table 24. Characteristics and Productivity Indexes of Soil Association 24 — Lawson-Sawmill-Darwin Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
306 Allison	1-3	17	sicl	3.0	A	35	sicl	Well-mod. well	Moderate	M	H	sicl alluvium	11.4	0.28	145	120
302 Ambraw	0-2	14	cl	2.5	B	31	cl-scl	Poor	Mod.-mod. slow	L	M	scl-sl alluvium	10.4	0.28	130	105
597 Armiesburg	0-2	14	sicl	3.0	A	25	sicl	Well-mod. well	Moderate	M	H	sicl alluvium	11.8	0.28	140	118
70 Beaucoup	0-2	15	sicl	4.5	A	35	sicl	Poor	Moderate	L	M	sicl alluvium	12.0	0.32	135	112
603 Blackoar	0-5	16	sil	4.0	B	30	sil	Poor	Moderate	M	M	sil alluvium	13.2	0.28	140	115
457 Booker	0-2	16	sic-c	4.0	A	30	sic-c	Poor-v. poor	Very slow	L	M	sic-c alluvium	6.4	0.28	80	65
589 Bowdre	0-8	6	sic	3.0	A	10	sic	SW. poor	Slow-mod.	M	L	sil-ls alluvium	9.3	0.37	110	90
590 Cairo	1-5	17	sic	4.0	A	18	sic	Poor	V. slow-rapid	L	M	ls alluvium	7.2	0.28	115	95
400 Calco	0-2	35	sicl	6.0	A	10	sicl	Poor	Moderate	L	L	sicl alluvium	12.4	0.28	130	108
402 Colo	0-2	33	sicl	6.0	A	11	sicl	Poor	Moderate	L	M	sicl alluvium	12.7	0.28	145	120
776 Comfrey	0-2	26	cl	6.0	B	12	cl	Poor-v. poor	Moderate	L	M	cl alluvium	11.0	0.28	135	112
71 *Darwin*	0-2	14	sic	3.5	A	38	sic-c	Poor-v. poor	Very slow	L	L	sicl alluvium	7.4	0.28	100	82
321 DuPage	0-2	30	sil	4.0	B	10	l	Well-mod. well	Moderate	M	L	l alluvium	11.2	0.28	125	100
591 Fults	0-3	12	sic	3.5	A	30	c-cl	Poor	V. slow-rapid	L	L	sl alluvium	7.7	0.28	110	90
162 Gorham	0-3	13	sicl	4.5	A	37	sicl	Poor	Mod.-mod. slow	L	M	sl alluvium	9.9	0.32	140	115
600 Huntington	1-5	11	sil	3.0	B	40	sil-sicl	Well	Moderate	M	H	l-sl alluvium	11.1	0.32	145	120
77 Huntsville	0-5	36	sil	3.5	B	12	sil	Well-mod. well	Moderate	M	H	l-sil alluvium	13.0	0.28	150	125
304 Landes	1-15	13	fsl	2.0	C	20	fsl	Well-mod. well	Rapid-mod. rapid	M	L	fs-sil alluvium	7.8	0.20	100	80
451 *Lawson*	0-3	30	sil	4.0	B	10	sil	SW. poor	Moderate	M	M	sil alluvium	12.6	0.32	155	128
248 McFain	0-1	14	sic	3.5	A	25	sil-sl	Poor-v. poor	Slow	L	L	fsl alluvium	9.8	0.28	110	92
682 Medway	0-3	18	sicl	4.5	A	20	l-sicl	Mod. well	Moderate	M	M	l-sl alluvium	9.2	0.32	130	105
82 Millington	0-2	15	l	5.0	C	20	l	Poor	Moderate	L	L	l-sl alluvium	9.6	0.28	130	105
592 Nameoki	0-3	11	sic	3.5	A	40	sic-sil	SW. poor	V. slow-mod.	M	M	sil-ls alluvium	9.5	0.28	125	102
76 Otter	0-4	32	sil	5.5	B	10	sil	Poor	Moderate	L	M	l-sl alluvium	11.8	0.28	140	115
619 Parkville	0-2	16	sic	3.0	A	15	fsl	SW. poor	V. slow-mod.	M	M	sil-fsl alluvium	9.1	0.28	120	98
74 Radford	1-5	19	sil	4.0	B	10	sil	SW. poor	Moderate	M	M	sicl alluvium	12.6	0.28	140	118
452 Riley	0-10	13	sicl	3.5	A	14	sicl-l	SW. poor	Mod.-rapid	M	M	ls-s alluvium	5.9	0.28	125	102
73 Ross	0-4	15	l	4.0	C	20	l-sicl	Well	Moderate	M	M	l-sl alluvium	9.6	0.32	140	118
107 *Sawmill*	0-3	32	sicl	4.5	A	18	sicl	Poor	Moderate	L	M	sicl alluvium	12.0	0.28	140	120
138 Shiloh	0-2	17	sicl-sic	4.5	A	30	sicl-sic	Poor-v. poor	Mod. slow-slow	L	L	sicl-sic alluvium	8.8	0.28	135	112
587 Terril	2-14	28	l	3.5	C	17	cl	Mod. well	Moderate	M	M	cl alluvium	11.0	0.28	135	112
284 Tice	0-4	13	sicl	3.5	A	32	sicl	SW. poor	Moderate	M	M	sicl alluvium	11.2	0.32	145	122
404 Titus	0-2	14	sicl-sic	4.0	A	30	sicl-sic	Poor	Slow	L	L	sicl alluvium	9.0	0.32	125	100
83 Wabash	0-2	19	sic	4.0	A	30	sic-c	Poor-v. poor	V. slow	L	L	sic-c alluvium	6.8	0.28	105	88
456 Ware	1.6	14	sil	2.5	B	8	l-fsl	Well-mod. well	Mod.-rapid	M	M	fsl alluvium	10.2	0.32	115	98

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

The poorly drained Gorham soils formed in moderately fine or fine-textured materials over sandy soil materials. They occur on nearly level parts of the floodplain, and are moderately slowly permeable in the upper part and rapidly permeable in the lower part. Landes soils are well and moderately well drained. They formed in moderately coarse and coarse soil materials and are rapidly and moderately rapidly permeable. These soils occur on gently sloping to strongly sloping parts of the floodplain.

McFain soils are poor or very poorly drained. They formed in clayey soil materials over silty and sandy soil materials and occur on nearly level or depressional parts of the floodplain. They are slowly permeable and calcareous throughout. The somewhat poorly drained Nameoki and the poorly drained Fults soils formed in silty clay or clay on loamy material and are closely related. The somewhat poorly drained Parkville soils occur on nearly level parts of the floodplain and formed in clayey soil material over silty and sandy soil material. These soils are very slowly and slowly permeable in the upper part and moderate or moderately rapidly permeable in the lower part.

Radford soils are somewhat poorly drained. They formed in silty soil materials over moderately fine-textured soil materials. These soils occur on nearly level or gently sloping parts of the floodplain and are moderately permeable. The well drained Ross and poorly drained Comfrey soil are closely related and formed in loamy material more than 40 inches thick. They have dark surfaces 24 to 40 inches thick.

Shiloh soils are very poorly drained. They formed in clayey soil materials and are moderately slow or slowly permeable. These soils are nearly level and depressional. The moderately well drained Terril soils formed in loamy, silty, and moderately fine-textured soil materials. They occur on gently sloping to strongly sloping parts of the floodplain and are moderately permeable. Titus soils are poorly drained and formed in clayey soil materials; they are nearly level and slowly permeable. Wabash soils are very poorly drained, formed in clayey soil materials, and are very slowly permeable. Wabash soils are nearly level or depressional. The well and moderately well drained Ware soils formed in loamy soil materials, occur on nearly level or gently sloping parts of the floodplain, and are moderately or rapidly permeable.

The major problems with these soils are flooding and wetness. Other problems that occur only on some of these soils are clayey surface textures and very slow permeability. Most areas of this association are cultivated except where the floodplains are narrow, cut up by streams, or frequently flooded. Many areas in the Mississippi, Ohio, Wabash, and Illinois River valleys are levied and in drainage districts.

The principal crops grown on these soils are corn and soybeans. Small grains are grown in some areas that are protected from flooding. These soils respond well to good management. Tile or surface ditches will drain all the wet soils except the fine to very fine-textured Booker, Darwin, and Wabash soils. Tile may shift out of line if placed in the loamy or sandy materials underlying such soils as Nameoki, Fults, Cairo, Parkville, McFain, Bowdre, and Riley. Erosion is not generally a problem with these soils, although some scouring and stream bank cutting occurs, particularly in unlevied areas. Various characteristics and the productivity indexes of the soils of association 24 are given in Table 24.

Soil Association 25

Houghton-Palms-Muskego Soils

Soil association 25 consists of very poorly drained organic soils that occur in depressional areas scattered throughout northeastern and northwestern Illinois. A few areas are located in other counties in the northern one-half of the state but are too small to be shown on the General Soil Map. The organic matter content of these soils ranges from 20 percent in some mucks to as much as 70 percent in soils formed from peat. Organic soils cover only 75,800 acres or 0.2 percent of the state's land area.

Medium acid to mildly alkaline Houghton muck formed in more than 51 inches of organic material. Lena muck is similar to the Houghton soils but is calcareous. Muskego muck formed in 16 to 50 inches of organic material over sedimentary peat. Adrian, Palms, and Edwards mucks formed in 16 to 50 inches of organic material over sandy loam, loam, and marl, respectively.

Drainage is the chief management problem on these soils. Although they can be drained with tile, it is often difficult to maintain the grade and alignment of tile in low-density organic material. Surface ditches are also used to drain these soils. Subsidence (a lowering of the soil surface caused by shrinkage and decomposition) often occurs when thick organic soils are excessively drained. To avoid excessive subsidence, it is often necessary to design a drainage system for these soils that will control the water table level. Wind erosion can be a severe problem on larger areas of drained, unprotected organic soils. This problem can be controlled, however, through cover cropping, conservation tillage, and windbreaks.

Organic soils are not well suited to small grains and hay crops because of severe frost heaving and wetness in the winter and spring. Corn and soybeans are the principal agronomic crops on most areas of drained organic soils. Sod and some vegetable crops are also produced on these soils, especially near large urban areas. Various characteristics and the productivity indexes of the soils in association 25 are given in Table 25.

Soil Association 31

Seaton-Timula Soils

Soil association 31, which occurs in western and northwestern Illinois, consists primarily of the weakly to moderately developed, light-colored, forested soils in the bluff areas adjacent to the Mississippi River valley. Some of the soils in this association also occur in the bluff areas of the southern Mississippi River valley and adjacent to the Illinois and Wabash River valleys, but these areas are too small to be shown on the General Soil Map. This association occupies 209,400 acres or 0.6 percent of the state's land area.

The major soils of association 31, Seaton, Timula, and Mt. Carroll, formed in very thick loess on rolling to steep areas and narrow ridgetops. These soils are well or moderately well drained, have silt loam subsoils, and are moderately permeable. The Seaton soils with a sandy substratum have lower water-holding capacities than regular Seaton, which formed entirely in loess. The Seaton soils are the light-colored forested equivalents of the dark-colored Port Byron soils of association 1. Mt. Carroll is a prairie-to-forest transition soil, being intermediate in many properties between the Port Byron and Seaton soils.

Hamburg, one of the minor soil series, is composed entirely of calcareous (limey) loess, occurs on the immediate bluffs, and appears as steep-sided, cone-shaped mounds. These soils are drouthy and support hill prairie grasses rather than trees. The calcareous Bold soils occur on steep side slopes where erosion, caused either by geological processes or human activity, removed leached and developed soil material as fast as it formed. Hickory soils, which formed in Illinoian glacial till are present on the lower portion of some steep slopes. Blair soils, which occur near Hickory soils, are less well drained than Hickory but are loamy. They are also derived, at least in part, from till. The Sylvan, Iona, Reesville, and Whitson soils form a drainage sequence in which the depth to calcareous loess is shallow. All these soils have moderately developed silty clay loam subsoils. The well-drained Sylvan soils are common in associations 32 and 33, as well as in association 31. The moderately well drained Iona, somewhat poorly drained Reesville, and poorly drained Whitson soils are most common in association 33 along the Wabash River valley.

The loess soils of association 31 are silty, have high water-holding capacities, and except for the calcareous Hamburg and Bold soils are productive for most crops where the slopes are not too steep. On the sloping areas, erosion control is a major problem. Steep areas, many of which are already severely eroded if they have been cultivated, should be used for pasture or timber production.

Fertility problems on these soils can generally be easily managed with good soil testing and soil treatment programs. In areas where gently sloping ridgetops are narrow and side slopes are moderately sloping to steep, fields are often small and irregularly shaped, making the use of large farm equipment difficult. These areas are often best suited for alfalfa or other hay crops or for pasture for livestock. Various characteristics and the productivity indexes of the soils in association 31 are given in Table 26.

Soil Association 32

Fayette-Rozetta-Stronghurst Soils

The Fayette, Rozetta, Stronghurst soil association occurs in northwestern and western Illinois along the valleys of the Mississippi and Illinois rivers in the upland, thick loess areas. Along the Mississippi River valley, the soils are slightly farther removed from the bluff than the soils of association 31. Along the Illinois River valley, where the weakly developed soils of association 31

Table 25. Characteristics and Productivity Indexes of Soil Association 25 — Houghton-Palms-Muskego Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
777 Adrian	0-2	34	Muck	65+	E	Below 34 in. (see substratum)			..	L	L	sand	15.2	..	95	78
312 Edwards	0-2	32	Muck	65+	E	Below 32 in. (see substratum)			..	L	L	marl	13.1	..	95	78
97 *Houghton*	0-2	60+	Peat	65+	E	..	Peat	V. poor	..	L	L	muck or peat	24.0	..	115	95
103 *Houghton*	0-2	60+	Muck	65+	E	..	Muck	V. poor	..	L	L	muck or peat	24.0	..	125	105
210 Lena	0-2	60+	Muck	65+	E	..	Muck	V. poor	..	L	L	muck or peat	24.0	..	120	100
638 *Muskego*	0-2	30	Muck	65+	E	Below 30 in. (see substratum)			..	L	L	sedimentary peat	18.3	..	120	100
100 *Palms*	0-2	35	Muck	65+	E	Below 35 in. (see substratum)			..	L	L	I wash	18.5	..	110	90

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

are absent, soil association 32 occurs in the bluff area adjacent to the valley. The soils of association 32 are intermediate in many respects, especially in degree of development, between the soils of associations 31 and 34, and are considered to be the light-colored counterparts of the dark-colored soils of association 2. They are also considered to be the northern Illinois equivalent of the soils in association 33. Association 32 occupies 2,252,800 acres or 6.3 percent of the state's land area.

The major soils in this association, Fayette, Rozetta, Stronghurst, and Traer, form a drainage sequence. These four soils are well, moderately well, somewhat poorly, and poorly drained, respectively, and their internal drainage is related to the sloping to flat topography on which they occur. These soils have high amounts of available water for crops, and are highly productive under good management.

The Sylvan, Iona, Reesville, and Whitson soils form a second drainage sequence in association 32 that parallels the Fayette sequence in many properties. The main difference between the two is that the second group has calcareous (limey) loess at a depth of less than 42 inches, while the Fayette sequence is more deeply leached of carbonates. The Sylvan soils are common in soil association 32, 33, and 34. The Iona, Reesville, and Whitson soils are most extensive in soil association 33 along the Wabash River valley.

Two other extensive soils in this association are the moderately well to well drained Downs and the somewhat poorly drained Atterberry series. Both are prairie-to-forest transitional soils, the Downs being intermediate in many respects between the Fayette and Rozetta and the Tama soils of association 2, and the Atterberry soils being intermediate between Stronghurst and the Muscatine soils of association 2.

Hamburg, one of the minor soils, is composed entirely of calcareous loess, and commonly occurs as conical mounds on the immediate bluff areas along the Illinois River valley, especially in Cass and Menard counties. Bold soils are also commonly located on side slopes where erosion prevents soil development, leaving the calcareous loess exposed.

The Hickory and Blair soils developed in Illinoian glacial till on sloping to very steep lower side slopes. Ursa, Atlas, Fishhook, and Elco soils developed in less than 40 inches of loess and the underlying paleosol in glacial till. They commonly occur at intermediate levels in coves and on upper side slopes.

Erosion control and fertility are two of the major problems in association 32. Any sloping soil in this area will have serious erosion problems; and because of unfavorable properties in their subsoils, the sloping or steep soils that have paleosolic influence are even more vunerable to erosion than the loess soils. Proper erosion control systems should be used on all sloping soil areas. Many of the steep, cultivated areas should be used for pasture and hay crops or for timber production. Fertility problems in this association can usually be solved by proper soil testing and soil treatment programs. Various characteristics and the productivity indexes of the soils in association 32 are given in Table 27.

Soil Association 33

Alford-Muren-Iva Soils

The soils in association 33 are light colored, having developed in loess under native trees, and occur on hilly land along major streams. The association covers a sizeable area that extends along the east side of the Mississippi River valley from near Belleville to near Carbondale. Smaller areas of these soils are scattered along the west side of the Wabash and Ohio River valley between Shawneetown and the Indiana line in Clark County. Association 33 occupies 356,200 acres or 1.0 percent of the state's land area.

The major soils in this area, Alford, Muren, and Iva, form a catena or drainage sequence. The Alford soils occur on steep side slopes and narrow, rounded ridgetops. They are well drained but must be managed carefully to protect them from erosion. The Muren soils are moderately well drained and the Iva somewhat poorly drained. They occur on gently sloping ridgetops, the Iva commonly being located on the somewhat broader, more level ridgetops.

The minor soils, Sylvan, Iona, Reesville, and Whitson, form a catena or drainage sequence similar to the one that includes the Alford, Muren, Iva soils, except that all four of these minor soils are calcareous within 42 inches and Whitson soils are poorly drained. The Hamburg and Bold soils differ from Alford and Iona in being calcareous throughout. The Hickory and Blair soils developed in Illinoian glacial till on sloping to very steep lower side slopes. Ursa, Atlas, and Elco developed in loess and the underlying, moderately slowly to slowly permeable glacial till paleosol. The Negley, Parke, and Pike soils are in loess and an underlying paleosol that developed in gravelly or loamy, permeable glacial outwash material.

The soils in this association are well structured, high in silt and very low in sand, and have a high capacity to store water for plants. The steeper areas (particularly of the soils, such as Negley, Ursa, and Atlas, that have paleosols) are used primarily for timber or forage. Production of row crops, often in rotation with wheat and forage crops, is limited to the gently to moderately sloping areas, many of which are small and irregularly shaped

Table 26. Characteristics and Productivity Indexes of Soil Association 31 — Seaton-Timula Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	lo. wash on till paleosol	10.6	0.37	105	80
35 Bold	5-35	7	sil	1.0	C	10	sil	Well	Moderate	L	L	sil loess	12.5	0.43	70	55
30 Hamburg	7-60	4	si	1.0	C	10	si	Well	Moderate	L	L	sil loess	11.5	0.43	65	50
8 Hickory	5-60	11	l	1.5	C	35	cl	Well-mod. well	Moderate	L	M	l till	10.1	0.37	80	58
307 Iona	0-6	10	sil	2.0	C	35	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	120	95
268 Mt. Carroll	1-20	13	sil	2.5	C	32	sil	Well-mod. well	Moderate	H	H	sil loess	12.9	0.32	135	110
723 Reesville	0-6	12	sil	2.0	C	25	sicl	SW. poor	Mod. slow-slow	L	M	sil loess	10.9	0.37	125	100
274 *Seaton*	2-45	9	sil	2.0	C	51	sil	Well-mod. well	Moderate	H	H	sil loess	12.8	0.37	115	90
563 Seaton, san. sub.	2-18	10	sil	2.0	C	32	sil-l	Well-mod. well	Mod.-mod. rapid	M	M	aeolian fs	8.5	0.37	100	78
19 Sylvan	2-30	12	sil	2.0	C	18	sicl	Well	Moderate	M	M	sil loess	12.5	0.37	110	85
271 *Timula*	5-40	12	sil	1.5	C	15	sil	Well-mod. well	Moderate	H	M	sil loess	12.9	0.37	105	82
116 Whitson	0-3	11	sil	2.0	C	35	sicl	Poor	Mod. slow-slow	M	M	sil loess	12.1	0.43	115	92

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 27. Characteristics and Productivity Indexes of Soil Association 32 — Fayette-Rozetta-Stronghurst Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
7 Atlas	4-18	9	sil	1.5	C	60	sicl-c	SW. poor	V. slow	L	L	cl paleosol	7.6	0.43	55	42
61 Atterberry	0-5	15	sil	3.0	C	35	sicl	SW. poor	Moderate	M	M	sil loess	12.2	0.32	140	115
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	lo wash on till paleosol	10.6	0.37	105	80
35 Bold	5-35	7	sil	1.0	C	10	sil	Well	Moderate	L	L	sil loess	12.5	0.43	70	55
386 Downs	2-20	12	sil	3.0	C	40	sicl	Mod. well-well	Moderate	H	H	sil loess	11.9	0.32	140	115
119 Elco	3-18	12	sil	2.0	C	48	sicl-cl	Well-mod. well	Mod.-mod. slow	M	M	l paleosol	11.4	0.37	110	88
280 *Fayette*	1-25	11	sicl	2.0	C	35	sicl	Well	Moderate	H	H	sil loess	11.6	0.37	125	100
6 Fishhook	2-12	5	sil	2.0	C	55	sicl-c	SW. poor	Slow-v. slow	L	L	cl paleosol	9.4	0.43	70	55
30 Hamburg	7-60	4	si	1.0	C	10	si	Well	Moderate	L	L	sil loess	11.5	0.43	65	50
8 Hickory	5-60	11	l	1.5	C	35	cl	Well-mod. well	Moderate	L	M	l till	10.1	0.37	80	58
307 Iona	0-6	10	sil	2.0	C	35	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	120	95
723 Reesville	0-6	12	sil	2.0	C	25	sicl	SW. poor	Mod. slow-slow	L	M	sil loess	10.9	0.37	125	100
279 *Rozetta*	0-8	11	sil	2.0	C	40	sicl	Mod. well	Moderate	H	H	sil loess	11.9	0.37	125	100
278 *Stronghurst*	0-5	11	sil	2.0	C	36	sicl	SW. poor	Mod.-mod. slow	M	M	sil loess	12.0	0.37	135	108
19 Sylvan	2-30	12	sil	2.0	C	18	sicl	Well	Moderate	M	M	sil loess	12.5	0.37	110	85
633 Traer	0-2	10	sil	2.0	C	38	sicl	Poor	Slow	M	M	sil loess	11.8	0.37	120	95
605 Ursa	4-20	8	sil	1.5	C	55	cl-c	Mod. well	Mod. slow-slow	L	L	cl paleosol	9.1	0.37	60	45
116 Whitson	0-3	11	sil	2.0	C	35	sicl	Poor	Mod. slow-slow	M	M	sil loess	12.1	0.43	115	92

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

on ridgetops. These soils respond well to a high level of management, although uses for many of them are severely limited by steep slopes.

Except for the Whitson series, the soils of this association are sloping enough for erosion to be a problem. Many of the steeper, cultivated areas have lost their topsoil, and their yellowish brown subsoil is exposed on side slopes. Fertility problems can be solved easily on the loess soils with proper soil test and soil treatment programs. Various characteristics and the productivity indexes of the soils in association 33 are given in Table 28.

Soil Association 34

Clinton-Keomah-Rushville Soils

The soils in association 34 are light colored, having developed under forest in deep loess, and occur primarily on the hilly land along the Illinois River valley and its tributaries from Peoria and Woodford counties down to the Mississippi River. Several smaller, scattered areas are located along lesser tributaries to the Mississippi River between Moline and St. Louis. This association is one of the most extensive in Illinois, occupying 2,804,000 acres or 7.9 percent of the state's land area.

The Clinton and Rozetta soils, both of which are moderately well drained, form a drainage sequence with the somewhat poorly drained Keomah and poorly drained Rushville soils. Clinton soils contain slightly more clay in their subsoils than the Rozetta soils, and are moderately slowly permeable rather than moderately permeable. More of the Rozetta soils than of the Clinton soils in association 32 are currently being mapped with the Keomah and Rushville soils in association 34. Clinton and Rozetta soils are located on narrow, rounded ridgetops and on side slopes. They are moderately well drained but are subject to erosion. Some have already lost part of their naturally light-colored surface soil and now have subsoil material mixed into the plow layer. Fortunately, the subsoil material has some favorable characteristics. The eroded areas have poorer tilth than the uneroded ones; during most years, however, high levels of production can still be experienced in those areas under good management.

Keomah and Rushville soils occur on gently sloping to nearly level areas on moderately wide to wide ridgetops. They are naturally wet and require artificial drainage for optimum productivity. Keomah soils are somewhat poorly drained and can be tile drained. They are located on moderately wide ridgetops and along the edges or on the slightly elevated areas of the wide ridgetops. Rushville soils, which are poorly drained, occur on the flattest areas toward the center of the wider ridgetops. Generally, tile do not function adequately in Rushville soils.

Downs and Clarksdale soils, which are among the minor soils in this association, developed under both grass and trees and differ from Clinton and Keomah soils by having darker colored surface soils. Hickory and Blair soils developed in Illinoian glacial till on sloping to very steep lower side slopes. Ursa, Atlas, Fishhook, and Elco soils developed in less than 40 inches of loess and the underlying paleosol in glacial till. They commonly occur at intermediate levels in coves, on upper side slopes, and on narrow, sloping ridgetops. Negley, Parke, and Pike soils are in loess and an underlying paleosol developed in gravelly or loamy glacial outwash material. The moderately well drained to well drained El Dara soils are located on sloping to steep areas mainly in Adams and Pike counties, where Cretaceous, sandy materials are exposed on the surface.

The soils in this association are well structured, moderately slowly to slowly permeable, high in silt, and very low in sand. Because of their high silt content, these soils have a high capacity to store water for crop growth. They respond well to management, although uses for many of them are limited by steep slopes. The steeper areas are used primarily for timber or forage production. Production of row crops, often in rotation with wheat and forage crops, is limited to the gently to moderately sloping areas on ridgetops. Many of those areas are small and irregularly shaped.

Except on the nearly level to gently sloping Clarksdale, Koemah, and Rushville soils, this soil association has serious erosion problems. Many sloping and steep, eroded areas in association 34, especially on those soils having paleosolic influence in their lower profiles, should be used for pasture or timber production or the development of wildlife areas. Soils of association 34 are considered as the light-colored, forested analogues of the dark-colored soils of associations 3 and 4. Various characteristics and the productivity indexes of the soils in association 34 are given in Table 29.

Soil Association 35

Hosmer-Stoy-Weir Soils

The soils in association 35 are moderately productive, light colored, and developed under trees in moderately thick loess. They occur on the hilly land along major streams in the general region that extends from Montgomery County on the north, to Jackson and Williamson County on the south, and to Clark County on the east. In addition, a fairly narrow band of these soils parallels the Wabash River valley from Clark County on the north to Gallatin County on the south. Along the Mississippi and Wabash River valleys, these soils are located between the Alford and related soils of association 33 in the bluff area and the Ava and related soils of association 36 in

Table 28. Characteristics and Productivity Indexes of Soil Association 33 — Alford-Muren-Iva Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
308 *Alford*	1-40	9	sil	2.0	C	40	sicl	Well	Moderate	M	M	sil loess	14.2	0.37	125	100
7 Atlas	4-18	9	sil	1.5	C	60	sicl-c	SW. poor	V. slow	L	L	cl paleosol	7.6	0.43	55	42
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	lo wash on till paleosol	10.6	0.37	105	80
35 Bold	5-35	7	sil	1.0	C	10	sil	Well	Moderate	L	L	sil loess	12.5	0.43	70	55
119 Elco	3-18	12	sil	2.0	C	48	sicl-cl	Well-mod. well	Mod.-mod. slow	M	M	l paleosol	11.4	0.37	110	88
30 Hamburg	7-60	4	si	1.0	C	10	si	Well	Moderate	L	L	sil loess	11.5	0.43	65	50
8 Hickory	5-60	11	l	1.5	C	35	cl	Well-mod. well	Moderate	L	M	l till	10.1	0.37	80	58
307 Iona	0-5	10	sil	2.0	C	35	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	120	95
454 *Iva*	1-4	13	sil	2.0	C	36	sicl	SW. poor	Slow	M	M	sil loess	12.1	0.43	135	108
453 *Muren*	1-6	11	sil	2.0	C	36	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	130	102
585 Negley	6-35	10	l	1.5	C	60	gl l-gl cl	Well	Mod.-mod. rapid	L	L	cl ow paleosol	6.9	0.32	105	80
15 Parke	0-35	12	sil	1.5	C	48	sicl-cl	Well	Moderate	L	L	cl paleosol	10.9	0.37	115	88
583 Pike	1-12	10	sil	1.5	C	50	sicl-cl	Well	Moderate	M	M	cl paleosol	12.3	0.37	120	92
723 Reesville	0-6	12	sil	2.0	C	25	sicl	SW. poor	Mod. slow-slow	L	M	sil loess	10.9	0.37	125	100
19 Sylvan	2-30	12	sil	2.0	C	18	sicl	Well	Moderate	M	M	sil loess	12.5	0.37	110	85
605 Ursa	4-20	8	sil	1.5	C	55	cl-c	Mod. well	Mod. slow-slow	L	L	cl paleosol	9.1	0.37	60	45
116 Whitson	0-3	11	sil	2.0	C	35	sicl	Poor	Mod. slow-slow	M	M	sil loess	12.1	0.43	115	92

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 29. Characteristics and Productivity Indexes of Soil Association 34 — Clinton-Keomah-Rushville Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
7 Atlas	4-18	9	sil	1.5	C	60	sicl-c	SW. poor	V. slow	L	L	l-cl till	7.6	0.43	55	42
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	lo wash on till paleosol	10.6	0.37	105	80
257 Clarksdale	0-5	12	sil	3.0	C	36	sicl	SW. poor	Mod. slow	M	M	sil loess	12.1	0.37	135	112
18 *Clinton*	2-18	12	sil	2.0	C	48	sicl	Mod. well-well	Mod. slow	H	M	sil loess	11.9	0.37	125	100
386 Downs	2-20	12	sil	3.0	C	40	sicl	Mod. well-well	Moderate	H	H	sil loess	11.9	0.32	140	115
119 Elco	3-18	12	sil	2.0	C	48	sicl-cl	Well-mod. well	Mod.-mod. slow	M	M	l paleosol	11.4	0.37	110	88
264 El Dara	7-30	10	sl	1.0	D	38	scl	Mod. well-well	Moderate	L	L	sl-ls Cretaceous ow.	8.6	0.24	90	72
6 Fishhook	2-12	5	sil	2.0	C	55	sicl-c	SW. poor	Slow-v. slow	L	L	cl paleosol	9.4	0.43	70	55
8 Hickory	5-60	11	l	1.5	C	35	cl	Mod. well-well	Moderate	L	M	l till	10.1	0.37	80	58
17 *Keomah*	1-5	12	sil	2.0	C	36	sicl-sic	SW. poor	Mod. slow	H	M	sil loess	11.9	0.37	125	100
585 Negley	6-35	10	l	1.5	C	60	gl l-gl cl	Well	Mod.-Mod. rapid	L	L	cl ow. paleosol	6.9	0.32	105	80
15 Parke	0-35	12	sil	1.5	C	48	sicl-cl	Well	Moderate	L	L	cl paleosol	10.9	0.37	115	88
583 Pike	1-12	10	sil	1.5	C	50	sicl-cl	Well	Moderate	M	M	cl paleosol	12.3	0.37	120	92
16 *Rushville*	0-3	14	sil	1.5	C	40	sicl-sic	Poor	Slow-v. slow	M	L	sil loess	10.8	0.43	110	85
605 Ursa	4-20	8	sil	1.5	C	55	cl-c	Mod. well	Mod. slow-slow	L	L	cl paleosol	9.1	0.37	60	45

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

the center of southern Illinois. Soil association 35 occupies 1,221,400 acres or 3.4 percent of the state's land area. It is often considered to be the light-colored, forested counterpart of soil association 5.

The major soils in this association, Hosmer, Stoy, and Weir, form a drainage sequence that ranges from moderately well drained (Hosmer) to poorly drained (Weir). Hosmer soils occur on narrow, rounded ridgetops and on side slopes. They are well to moderately well drained but are subject to erosion and somewhat drouthy. Some have already lost part of their natural surface soil, and now have subsoil material mixed into the plow layer. The eroded Hosmer soils have poorer tilth and are less productive than the uneroded ones. Hosmer soils have very slow permeability in the lower part.

Stoy and Weir soils are located on the moderately sloping to flat areas of moderately wide to wide ridgetops. They are naturally wet but do not respond well to tile drainage. Stoy soils are somewhat poorly drained and occur on moderately wide ridgetops and on the more sloping areas near the wide ridgetops. Weir soils are poorly drained and occur on the flattest areas toward the center of the wider ridgetops.

Wartrace soils, which are among the minor soils in this association, are much like Hosmer soils in the upper part but lack the very slowly permeable layer below 30 inches. Hickory and Blair soils developed in Illinoian glacial till on sloping to very steep lower side slopes. Ursa and Atlas soils have developed in less than 20 inches of loess and the underlying paleosol in glacial till. They commonly occur at intermediate levels in coves, on upper side slopes and on narrow, sloping ridgetops. Negley, Parke, and Pike soils are developed in loess and an underlying paleosol that developed in gravelly or loamy glacial outwash. Frondorf soils developed in 12 to 24 inches of loess and underlying residuum from interbedded sandstone, silt stone and shale.

These soils have slow to very slow permeability and moderate available-water holding capacity. The lower subsoil of Hosmer and Stoy soils contains a root-restricting layer, which is, if not a fragipan, a fragizone bordering a fragipan. The Weir subsoil is high in clay and resembles a claypan. Erosion is a major problem on the sloping areas of these soils. Many areas on cultivated slopes have lost all of their topsoil. Erosion is especially damaging on soils such as Hosmer because it reduces the depth to root-restricting layers in the lower subsoil. Strongly sloping and steep areas should be used for forage or timber production. On the gently to moderately sloping areas on ridgetops, row crops are commonly grown in rotation with wheat and forage crops. Many of the areas that are suitable for row-crop production are small and irregularly shaped. Although their response to high management is moderate to good, use of many of these soils is limited by steep slopes. Fertility management should involve soil testing and soil treatment programs. Various characteristics and the productivity indexes of soils in association 35 are given in Table 30.

Table 30. Characteristics and Productivity Indexes of Soil Association 35 — Hosmer-Stoy-Weir Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
7 Atlas	4-18	9	sil	1.5	C	60	sicl-c	SW. poor	V. slow	L	L	l-cl till	7.6	0.43	55	42
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	lo wash on till paleosol	10.6	0.37	105	80
786 Frondorf	6-50	4	l	1.5	C	26	ch. sicl-l	Well	Moderate	L	L	ss. sis. sh. bedrock	7.0	0.32	70	55
8 Hickory	5-60	11	l	1.5	C	35	cl	Mod. well-well	Moderate	L	M	l till	10.1	0.37	80	58
214 *Hosmer*	1-25	12	sil	1.5	C	40	sicl-sil	Mod. well	Mod. slow	L	M	sil loess	11.1	0.43	115	88
585 Negley	6-35	10	l	1.5	C	60	gl l-gl cl	Well	Mod.-mod. rapid	L	L	cl ow. paleosol	6.9	0.32	105	80
15 Parke	0-35	12	sil	1.5	C	48	sicl-cl	Well	Moderate	L	L	cl paleosol	10.9	0.37	115	88
583 Pike	1-12	10	sil	1.5	C	50	sicl-cl	Well	Moderate	M	M	cl paleosol	12.3	0.37	120	92
164 *Stoy*	0-10	13	sil	2.0	C	35	sicl	SW. poor	Slow	L	M	sil loess	10.9	0.43	115	90
605 Ursa	4-20	8	sil	1.5	C	55	cl-c	Mod. well	Mod. slow-slow	L	L	cl paleosol	9.1	0.37	60	45
215 Wartrace	1-30	10	sil	2.0	C	36	sicl	Well	Mod.-mod. slow	M	M	sil loess	11.0	0.37	120	92
165 *Weir*	0-3	16	sil	2.0	C	30	sicl	Poor	V. slow-slow	L	L	sil loess	11.0	0.43	110	85

[a] See abbreviations at end of Key to Illinois Soils, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Soil Association 36

Ava-Bluford-Wynoose Soils

Soil association 36 occurs in the central part of southern Illinois, where the loess on nearly level, stable areas is about 30 to 55 inches thick over the very slowly permeable Sangamon paleosol. A layer of loamy material 1 foot to several feet thick is usually present between the loess and the very slowly permeable subsoil of the Sangamon paleosol. The loamy zone is a mixture of Roxana loess with the surface soil or wash of the Sangamon paleosol. It is thinnest on areas that were sloping and, consequently, eroding during its formation. This loamy zone is the same or very similar to the loamy layer in soil association 6, which is considered to be the prairie analogue of association 36. This extensive association occupies about 2,387,500 acres or 6.7 percent of the state's land area.

These soils formed under deciduous forest and are light colored. Although loess is from 30 to 55 inches on the nearly level areas, the soils on steeper slopes formed in very thin or no loess and glacial till or in paleosols that developed from the till.

The moderately well drained Ava soils form a drainage sequence with the somewhat poorly drained Bluford soils and the poorly drained Wynoose soils. These soils formed in loess and the underlying Illinoian loamy soil materials or glacial till. Wynoose and Ava soils are slowly to very slowly permeable and Bluford soils are slowly permeable. Wynoose has a claypan subsoil. Bluford also has high clay content in its subsoil, but its claypan is not as strongly developed as that of Wynoose. Ava has a silt pan or fragipan in its lower subsoil that limits permeability and restricts root penetration. The fragipan has high bulk density, and its structure is poorly developed. The gently sloping to strongly sloping Ava soils occur on crests of ridges or on the upper sides of drainageways. Wynoose soils are located on the edges of nearly level or flat drainage divides that border drainageways. Bluford soils, which are in a position intermediate between Ava and Wynoose soils, are nearly level or gently sloping.

The somewhat poorly drained Atlas soils and moderately well drained Ursa soils formed in clayey glacial till. They are very slowly to slowly permeable, respectively, and occur in the upper parts of the sloping and strongly sloping sides of drainageways. Hickory soils are well and moderately well drained. They formed in glacial till and are moderately permeable. The sloping to very steep Hickory soils occur on the sides of valleys. The somewhat poorly drained Blair soils formed in loess, local wash, and glacial till. They are moderately slowly permeable. Blair soils are located on the sloping to moderately steep sides of drainageways. Creal soils are somewhat poorly drained and formed in loess and underlying local wash or alluvium. They are moderately slowly permeable, nearly level to gently sloping, and occur near the base of long slopes. Racoon soils are poorly drained and formed in alluvium on low terraces along streams. They are slowly permeable and nearly level or gently sloping. The well-drained Frondorf soils formed in loess and residuum from sandstone, siltstone, and shale bedrock. They are moderately permeable and occur on the sloping to very steep sides of valleys. Kell soils are moderately well drained and formed in loess, till, and residuum from bedrock. These moderately slowly permeable soils are sloping and strongly sloping and occur on the sides of drainageways. The well-drained Negley soils formed in sandy and gravelly glacial outwash. They are moderately and moderately rapidly permeable, sloping to steep, and occur on the sides of ridges and drainageways. The well-drained Parke soils formed in 20 to 40 inches of loess on reddish paleosols, which developed in sandy and gravelly outwash similar to that in the Negley soils. Parke soils are moderately permeable and occur on nearly level to steep areas.

The major problems on these soils are erosion on sloping land, clayey subsoils on level land, low fertility, and low organic matter in the surface soil layer. Erosion control should be practiced on the sloping areas. To meet the high fertility needs of these soils, it is necessary to base soil treatment upon a good testing program. Wet soils such as Wynoose must be drained by surface ditches because tile do not function in them. Steep slopes are a problem on some of these soils such as Hickory. Soils in association 36 are only moderately productive but respond well to high levels of management. Corn, soybeans, wheat, hay, and milo are the main crops grown in this association. Some areas are used for pasture and others are in woodlands. Various characteristics and the productivity indexes of the soils in association 36 are given in Table 31.

Soil Association 37

Westville-Pecatonica-Flagg Soils

Soil association 37 occurs in extreme northern Illinois in Boone, Winnebago, Stephenson, Ogle, and Carroll counties, the largest area being in the northern half of Boone County. This association occupies about 127,900 acres or 0.4 percent of the state's land area.

The soils of this association have light or moderately dark-colored surface horizons, and prior to cultivation supported forest of mixed prairie-forest vegetation. They developed mainly in gently sloping to strongly sloping, upland areas. These upland areas were glaciated, and the parent materials are predominantly loam or sandy loam till of Illinoian age, with a loess cover ranging from 0 to 50 inches in thickness. Some areas developed in poorly

Table 31. Characteristics and Productivity Indexes of Soil Association 36 — Ava-Bluford-Wynoose Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
										Supply of						
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
7 Atlas	4-18	9	sil	1.5	C	60	sicl-c	SW. poor	Very slow	L	L	l-cl-till	7.6	0.43	55	42
14 *Ava*	1-18	9	sil	1.5	C	40	sicl-sil	Mod. well	Slow-v. slow	L	M	loamy wash on till paleosol	10.2	0.43	105	80
5 Blair	4-25	8	sil	1.5	C	50	sicl-cl	SW. poor	Mod. slow	L	M	loamy wash on till paleosol	10.6	0.37	105	80
13 *Bluford*	0-7	14	sil	1.5	C	36	sicl-sic	SW. poor	Slow	L	L	loamy wash on till paleosol	10.6	0.43	110	82
337 Creal	0-7	28	sil	1.5	C	22	sicl	SW. poor	Mod. slow	L	M	loamy wash on till paleosol	12.6	0.37	115	88
786 Frondorf	6-50	4	l	1.5	C	26	ch sicl-l	Well	Moderate	L	L	ss. sis. sh. bedrock	7.0	0.32	70	55
8 Hickory	5-60	11	l	1.5	C	35	cl	Mod. well-well	Moderate	L	M	l till	10.1	0.37	80	58
421 Kell	7-18	10	l-sil	1.5	C	30	cl-sicl	Mod. well	Moderate slow	L	L	ss. bedrock	7.7	0.43	70	55
585 Negley	6-35	10	l	1.5	C	60	gl l-gl cl	Well	Mod. to mod. rapid	L	L	cl ow. paleosol	6.9	0.32	105	80
15 Parke	0-35	12	sil	1.5	C	48	sicl-cl	Well	Moderate	L	L	cl paleosol	10.9	0.37	115	88
109 Racoon	0-5	30	sil	1.5	C	28	sicl-sic	Poor	Slow	L	L	loamy wash	11.6	0.43	115	88
605 Ursa	4-20	8	sil	1.5	C	55	cl-c	Mod. well	Mod. slow-slow	L	L	cl paleosol	9.1	0.37	60	45
12 *Wynoose*	0-3	18	sil	1.5	C	42	c-sicl	Poor	Very slow	L	L	loamy wash on till paleosol	10.0	0.43	105	78

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

stratified, water-deposited sediments, and the paleosol portion of the profiles is predominantly reddish. These soils developed in the same kinds of materials as those in association 7 and are their forested counterparts.

The soils of this association are all naturally well drained and have moderate permeability. Artificial drainage is not needed for crop production. The Flagg, Pecatonica, and Westville soils all have light-colored surface horizons and differ mainly in the thickness of the loess cover over the weathered, reddish drift. Flagg soils have 30 to 50 inches, Pecatonica soils 15 to 30 inches, and the Westville soils less than 15 inches of loess cover. The Myrtle and Argyle soils have moderately dark-colored surface horizons. Myrtle soils developed in 30 to 50 inches and Argyle soils developed in 15 to 30 inches of loess over drift.

Much of this association is used for the production of corn, soybeans, small grains, and hay. The more strongly sloping areas, particularly of the Pecatonica and Westville soils, are maintained in permanent pasture, and a few small areas are still in native forest. All of these soils respond to good management. The Westville soils tend to be somewhat drouthy during prolonged periods of dry weather. In order for these soils to remain productive, their fertility must be maintained. The major problem in this association is controlling erosion on the more sloping areas, where moderate erosion is common and severe erosion has occurred to some extent. Various characteristics and the productivity indexes of the soils in association 37 are given in Table 32.

Soil Association 38

Middletown-Tell-Thebes Soils

Soil association 38 occurs in central and northwestern Illinois in small, scattered areas. In central Illinois, it occurs mainly in Christian, Logan, Menard, and Sangamon counties; in northwestern Illinois, it is found in Carroll, Rock Island, Henry, Whiteside, Bureau, and Mercer counties. This association occupies about 90,400 acres or 0.3 percent of the state's land area.

The three soils in association 38 are light colored, having supported forest prior to cultivation. They developed in less than 40 inches of loess over loamy sand or sand deposits, except Middletown, which has a loess cover of 40 to 60 inches. These soils occur in upland areas and in outwash plains or on terraces, and occupy nearly level to strongly sloping landscape positions. In most areas, the underlying loamy sand to sand material is believed to have been deposited by wind. This association occurs with or near the dark-colored soils of soil association 8, which developed in the same kinds of materials.

The soils of association 38 are well or moderately well drained, and all have moderate permeability. They do not require artificial drainage. The Middletown soils are slightly more productive than the others because of their thicker loess cover and the slightly higher available-water holding capacity of their profile. Tell and Thebes soils are quite similar, except that the Tell soils have slightly weaker developed subsoils that contain less clay than the Thebes soils. The Tell soils are dominant in the areas in the northwestern part of the state, and Middletown and Thebes are the major soils in areas near the central part of Illinois.

Corn, soybeans, and small grains are most commonly grown on these soils. The more sloping areas are used for hay and pasture, and a few areas support native forest. All three soils respond well to good management. The major problems are maintaining fertility and controlling erosion on the more sloping areas. Thebes and Tell soils are drouthy during periods of low rainfall. Various characteristics and the productivity indexes of the soils in association 38 are given in Table 33.

Soil Association 39

Birkbeck-Sabina-Sunbury Soils

Soil association 39 occurs in the north central and east central parts of Illinois. Its total area is about 454,300 acres or 1.3 percent of the state's land area. It occurs near or with the dark-colored soils of association 9, which developed in the same kinds of materials. Except for the Hennepin soils, which developed in till on steep slopes, the soils in association 39 formed in 40 to 60 inches of loess and the underlying loamy glacial till. These nearly level to strongly sloping soils are located on upland till plains. The native vegetation of the Birkbeck, Sabina, and Hennepin soils was deciduous trees, and that of the Sunbury soils was prairie grasses and widely spaced deciduous trees.

These soils have a high available-water holding capacity. The moderately well to well drained Birkbeck soils have moderate permeability. They range from nearly level to strongly sloping and occur primarily on side slopes along drainageways. They also occur on some of the upper portion of the landscape. Surface runoff is medium to rapid on these soils. The somewhat poorly drained Sabina soils have moderately slow permeability. They contain more clay in the subsoil than the Birkbeck or Sunbury soils and range from nearly level to gently sloping. They are located on higher portions of the landscape. Surface runoff is medium to slow. The somewhat poorly drained Sunbury soils have moderate permeability and more organic matter and a darker surface soil than the Birkbeck or Sabina soils. They range from very gently sloping to gently sloping and occur on the higher portions of the landscape. Surface runoff is medium to slow. The well-drained Hennepin soils have moderately slow to slow permeability in the underlying material and a low available-water holding capacity. They range from strongly sloping to very steep and occur on side slopes along drainageways. Surface runoff is rapid to very rapid.

These soils respond to good management, and most areas are used for cultivated crops. Tile drainage of the Sabina and Sunbury soils will help improve crop yields in some years. Fertility needs can usually be met by good soil testing and soil treatment programs. The gently to

Table 32. Characteristics and Productivity Indexes of Soil Association 37 — Westville-Pecatonica-Flagg Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thickness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thickness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Subsoil: Supply of P	Subsoil: Supply of K	Substratum: Texture and material	Available water to 60 inches, in.	Erodibility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
227 Argyle	2-18	13	sil	3	C	47	sicl-cl	Well-mod. well	Moderate	M	H	cl-sl paleosol	10.5	0.32	120	98
419 *Flagg*	0-20	11	sil	2	C	49	sicl-cl	Well	Moderate	M	H	cl paleosol	10.8	0.37	120	98
414 Myrtle	2-18	13	sil	3	C	47	sicl-cl	Well	Moderate	M	H	cl paleosol	11.9	0.32	125	102
31 *Pecatonica*	2-18	11	sil	2	C	49	cl-scl	Well-mod. well	Moderate	M	H	cl-sl paleosol	10.8	0.37	115	92
22 *Westville*	2-30	8	sil	2	C	52	cl-scl	Well-mod. well	Moderate	M	M	cl-sl paleosol	10.6	0.37	110	88

[a] See abbreviations at end of Key to Illinois Soils, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 33. Characteristics and Productivity Indexes of Soil Association 38 — Middletown-Tell-Thebes Soils[a]

	Surface soil					Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
685 *Middletown*	2-12	14	sil	2	C	34	sicl	Well-mod. well	Moderate	M	M	lo s-fs aeolian	10.5	0.37	110	90
565 *Tell*	1-20	14	sil	2	C	18	sil-l	Well	Mod.-rapid	M	L	lo s-fs aeolian	8.0	0.37	105	85
212 *Thebes*	0-15	12	sil	2	C	23	sicl-scl	Well-mod. well	Mod.-rapid	M	L	lo s-fs aeolian	8.4	0.37	105	85

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

strongly sloping soils of this association are subject to erosion. The strongly sloping to very steep soils such as Hennepin should generally be used only for forage or timber production. Various characteristics and the productivity indexes of the soils in association 39 are given in Table 34.

Soil Association 41

St. Charles-Camden-Drury Soils

Soil association 41 occurs most commonly in the northern and north central parts of the state on glacial outwash and sandy loam till plains. A few areas occur in the counties along the Wabash and Mississippi rivers. This association occupies about 371,500 acres or 1.0 percent of the state's land area. It commonly occurs with the dark-colored soils of association 11, which developed in similar parent materials under grass vegetation.

The soils of association 41 formed mainly under deciduous forest, although some formed under a combination of prairie grasses and deciduous forest. They developed in variable thicknesses of loess over sandy outwash or sandy loam till. Most of these soils have moderate permeability; however, Starks and Virgil soils have moderate to moderately slow permeability, and Sexton soils have slow permeability.

The well and moderately well drained St. Charles soils form a drainage sequence with the somewhat poorly drained Kendall soils. These soils formed in 40 to 60 inches of loess and the underlying loamy outwash or sandy loam till. St. Charles soils occur on nearly level to sloping parts of the landscape, and the Kendall soils on nearly level or gently sloping parts. The well and moderately well drained Batavia soils form a drainage sequence with the somewhat poorly drained Virgil soils. These moderately dark-colored soils formed in 40 to 60 inches of loess and the underlying outwash, sandy loam till, or alluvial terrace soil materials. Batavia soils occur on nearly level and sloping parts of the landscape and are transitional between Plano and St. Charles soils. Virgil soils are located on nearly level and gently sloping areas and are transitional between Elburn and Kendall soils. Camden soils are well and moderately well drained and form a drainage sequence with the somewhat poorly drained Starks soils and the poorly drained Sexton soils. These soils formed in 24 to 40 inches of loess and loamy outwash or alluvium on outwash plains and alluvial terraces. Camden soils occur on nearly level to steep parts of the landscape, Sexton soils on the nearly level parts, and Starks soils on nearly level to gently sloping areas.

The well and moderately well drained Harvard soils form a drainage sequence with the somewhat poorly drained Millbrook soils. These moderately dark-colored soils formed in 24 to 40 inches of loess or silty material and the underlying loamy outwash or alluvium. Harvard soils occur on nearly level to sloping parts of the landscape, and Millbrook soils on nearly level and gently sloping areas. Harvard soils are transitional between Proctor and Camden soils, and Millbrook soils are transitional between Brenton and Starks soils.

The well or moderately well drained Zurich soils form a drainage sequence with the somewhat poorly drained Aptakisic soils. These soils formed in 24 to 40 inches of loess or silty material over loamy or silty outwash that is calcareous (limey) at depths of less than 40 inches. Zurich soils occur on gently sloping to moderately steep parts of the landscape and are commonly above the nearly level and gently sloping Aptakisic soils. Well and moderately well drained Grays soils form a drainage sequence with the somewhat poorly drained Wauconda soils. These moderately dark-colored soils formed in 24 to 40 inches of loess or silty material over loamy or silty outwash that is calcareous at depths of less than 40 inches. Gray soils are located on gently sloping and sloping parts of the landscape and Wauconda soils on nearly level and gently sloping areas. Grays soils are transitional between Barrington and Zurich soils, and Wauconda soils are transitional between Mundelein and Aptakisic soils. The well-drained Rush soils formed in

30 to 50 inches of loess or silty material over sandy or gravelly outwash that is leached more than 50 inches. These soils occur on nearly level and gently sloping parts of the landscape. The well and moderately well drained Bowes soils formed in 30 to 50 inches of loess or silty material over gravel and sand that is leached more than 50 inches. These moderately dark soils are located on nearly level to sloping parts of the landscape and are transitional between the Rush soils and the dark-colored Waupecan soils of association 11. Drury soils are well and moderately well drained. They formed in silty colluvium or alluvium on nearly level to sloping parts of the landscape, and commonly occur in colluvial positions below very thick loess bluffs, much in the same way as the Worthen and Raddle soils of association 11.

The major problems on these soils are erosion on sloping land, low fertility, and low organic matter in the surface layer. Most areas of this association are cultivated primarily in corn, soybeans, wheat, and hay. A few areas are in woods. The soils in this association are productive and respond to good management. Various characteristics and the productivity indexes of the soils in association 41 are given in Table 35.

Soil Association 42

Dodge-Russell-Miami Soils

Soil association 42 occurs on nearly level to strongly sloping uplands in northeastern and east central Illinois and covers about 381,000 acres or 1.1 percent of the

Table 34. Characteristics and Productivity Indexes of Soil Association 39 — Birkbeck-Sabina-Sunbury Soils[a]

		Surface soil				Subsoil				Supply of		Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
233 *Birkbeck*	0-12	10	sil	2	C	36	sicl	Mod. well-well	Moderate	M	H	l, sicl till or lac.	10.8	0.37	125	100
25 Hennepin	10-65	6	l	2	D	7	l	Well	Mod. slow-slow	M	H	l till	6.6	0.32	60	45
236 *Sabina*	0-5	12	sil	2	C	36	sicl	SW. poor	Mod. slow	M	H	l, sicl till or lac.	11.0	0.37	130	105
234 *Sunbury*	0-7	12	sil	3	C	35	sicl	SW. poor	Moderate	M	H	l, sicl till or lac.	11.0	0.32	140	115

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 35. Characteristics and Productivity Indexes of Soil Association 41 — St. Charles-Camden-Drury Soils[a]

		Surface soil				Subsoil				Supply of		Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
365 Aptakisic	0-5	10	sil	2.0	C	26	sicl	SW. poor	Moderate	L	M	lo ow.	8.9	0.37	115	92
105 Batavia	0-12	12	sil	2.5	C	38	sicl	Well-mod. well	Moderate	L	M	lo ow. or till	11.6	0.32	135	110
792 Bowes	0-10	13	sil	2.5	C	38	sicl	Well-mod. well	Moderate	L	M	s-g ow.	9.2	0.32	140	118
134 *Camden*	0-30	12	sil	2.0	C	40	sicl-sl	Well-mod. well	Moderate	L	M	lo ow.	10.8	0.37	120	95
75 *Drury*	1-12	12	sil	2.0	C	24	sil	Well-mod. well	Moderate	M	M	sil-l wash.	12.4	0.37	125	105
698 Grays	1-12	11	sil	2.5	C	20	sicl-l	Well-mod. well	Moderate	L	M	lo ow.	8.7	0.32	120	98
344 Harvard	0-10	11	sil	2.5	C	36	sicl-cl	Well-mod. well	Moderate	L	M	lo ow.	10.6	0.32	130	105
242 Kendall	1-7	11	sil	2.0	C	42	sicl	SW. poor	Moderate	L	M	lo ow. or till	11.6	0.37	130	105
219 Millbrook	1-5	12	sil	3.0	C	36	sicl-cl	SW. poor	Moderate	L	M	lo ow.	11.0	0.32	140	115
791 Rush	0-6	13	sil	2.0	C	42	cl-scl	Well	Moderate	L	M	s-g ow.	10.7	0.37	130	110
208 Sexton	0-2	16	sil	2.0	C	30	sicl	Poor	Slow	L	L	lo ow.	11.4	0.43	115	92
243 *St. Charles*	0-12	13	sil	2.0	C	42	sicl	Well-mod. well	Moderate	L	M	lo ow. or till	11.8	0.37	125	100
132 Starks	1-5	13	sil	2.0	C	36	sicl-cl	SW. poor	Mod.-mod. slow	L	M	lo ow.	11.1	0.37	125	100
104 Virgil	0-7	13	sil	3.0	C	40	sicl	SW. poor	Mod.-mod. slow	L	M	lo ow. or till	11.7	0.32	140	115
697 Wauconda	0-5	11	sil	3.0	C	26	sicl-l	SW. poor	Moderate	L	M	lo ow.	8.9	0.32	125	105
696 Zurich	1-18	9	sil	2.0	C	22	sicl-l	Well-mod. well	Moderate	L	M	lo ow.	10.2	0.37	115	90

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

state's land area. The largest areas of these soils are in Boone, DeKalb, Kane, Kendall and McHenry counties in the north and Clark, Coles, Cumberland, Edgar, and Shelby counties in the east central part. These light and moderately dark-colored soils formed in less than 40 inches of loess over loam-textured Wisconsinan till under forest or mixed grass and forest, and are similar to the dark-colored prairie soils of association 12.

The light-colored Russell, Xenia, and Fincastle soils are well, moderately well, and somewhat poorly drained, respectively. The moderately dark-colored Mellott, Wingate, and Toronto soils comprise a similar drainage sequence. All of these soils formed in 20 to 40 inches of loess over loam till, and have silty clay loam and clay loam-textured subsoils that are free of carbonates to depths below 42 inches. Mellott, Wingate, and Toronto are transitional between the Russell, Xenia, Fincastle sequence and the corresponding dark-colored Sidell, Dana, and Raub soils of association 12. Dodge and Herbert soils are similar in texture but are calcareous at depths between 24 and 42 inches. The light-colored Miami and the transitional Octagon and Montmorenci soils formed in less than 15 inches of loess on loam till and have silt loam surface horizons and clay loam textured subsoils that become calcareous at depths between 24 and 42 inches. Strawn and Hennepin soils, which occur on steeper slopes in the association, have formed from the glacial till and are calcareous at very shallow depths. Metea soils formed from sandy materials 20 to 40 inches thick on loam till and have a fairly low available-water holding capacity.

With the exception of the sandy Metea soils, these soils are moderately or moderately slowly permeable and have moderate to high available-water holding capacities. Tile can be used if needed on the somewhat poorly drained soils. The subsoil nutrient-supplying capacities of these soils are moderate, and crops respond well to limestone, nitrogen, phosphorus, and potassium where soils tests indicate a need for application.

Soil erosion is the principal management problem on these soils. Contouring and terracing are often difficult to practice because of short, irregular slopes, but grass waterways and minimum tillage can be used in most fields. Crop rotations that include legume hay and pasture effectively reduce erosion on these soils. The principal crops grown on them are corn, soybeans, and legume hay. Dairy and mixed livestock farms are common in this association in northern Illinois; much of the association's less productive, steeper land is in pasture. Various characteristics and the productivity indexes of the soils in association 42 are given in Table 36.

Soil Association 43

Kidder-McHenry Soils

Soil association 43 occurs on gently to strongly sloping uplands in northeastern Illinois in Boone, Cook, Kane, McHenry, and Winnebago counties. Its total area is 65,800 acres or 0.2 percent of the state's land area.

This association is composed of only a few soils, the Kidder and McHenry soils being the major ones. Well and moderately well drained Kidder soils formed in less than 15 inches of loess and McHenry soils formed in 15 to 30 inches of loess and the underlying calcareous sandy loam till. These light-colored forest soils are similar to the prairie soils of association 13. Kidder soils generally

Table 36. Characteristics and Productivity Indexes of Soil Association 42 — Dodge-Russell-Miami Soils[a]

		Surface soil				Subsoil						Sub-stratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thick-ness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thick-ness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	High mgmt.	Avg. mgmt.
24 *Dodge*	0-20	11	sil	2.0	C	24	sicl-cl	Well	Moderate	M	H	l till	9.9	0.37	125	100
496 Fincastle	1-3	11	sil	2.0	C	34	sicl-cl	SW. poor	Mod.-mod. slow	M	H	l till	10.5	0.37	130	102
25 Hennepin	12-65	6	l	2.0	D	6	l	Well	Mod.-mod. slow	L	M	l till	6.4	0.32	60	45
62 Herbert	0-3	12	sil	3.0	C	24	sicl-cl	SW. poor	Moderate	M	H	l till	10.0	0.32	135	110
407 Mellott	0-12	13	sil	2.5	C	44	sicl-cl	Well	Moderate	M	M	l till	11.0	0.32	130	102
205 Metea	0-15	10	sl	2.0	D	32	scl	Well	Mod.-rapid	M	L	l till	8.7	0.17	105	82
27 *Miami*	0-25	12	sil	2.0	C	24	cl	Well	Moderate	M	M	l till	9.8	0.37	120	95
57 Montmo-renci	0-5	11	sil	3.0	C	20	cl	Mod. well	Mod. slow	M	M	l till	9.5	0.32	125	100
656 Octagon	0-12	12	sil	3.0	C	24	cl	Well	Moderate	M	M	l till	10.0	0.32	125	100
322 *Russell*	3-18	10	sil	2.0	C	38	sicl-cl	Well	Moderate	M	M	l till	10.5	0.37	125	97
224 Strawn	5-45	7	sil	2.0	C	15	cl	Well-mod. well	Moderate	M	M	l till	8.0	0.37	105	82
353 Toronto	0-6	10	sil	3.0	C	38	sicl-cl	SW. poor	Moderate	M	M	l till	10.6	0.32	135	110
348 Wingate	1-6	13	sil	3.0	C	35	sicl-cl	Mod. well	Mod. slow	M	M	l till	10.7	0.32	130	105
291 Xenia	1-5	11	sil	2.0	C	44	sicl-cl	Mod. well	Mod. slow	M	M	l till	11.0	0.37	125	97

[a] See abbreviations at end of Key to Illinois Soils, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

have a silt loam A horizon and a loam, sandy clay loam, or clay loam subsoil over the glacial till. McHenry soils, which formed in thicker loess, have a silty clay loam upper subsoil.

The minor soils include Strawn and Hennepin, which occur on steeper slopes and formed in calcareous loam textured glacial till. Strawn is calcareous (limey) at depths of less than 24 inches, and Hennepin is limey at less than 10 inches. Metea soils formed in sandy materials that overlie the glacial till and have fairly low available-water holding capacities.

The soils in association 43 are permeable and have moderate available-water holding capacities. These soils respond well to fertilizer applications, and are moderately productive. The major crops include corn, soybeans, oats, forages, and pasture. Much of the association is devoted to dairy and livestock farms.

Soil erosion is the chief management problem on the steeper slopes. Contouring is often difficult on the short, irregular slopes that are often present in this association, but erosion can be controlled by minimum tillage, grass waterways, and rotations that include forage crops. Various characteristics and the productivity indexes of the soils in association 43 are given in Table 37.

Soil Association 44

Morley-Blount-Beecher Soils

Soil association 44 occurs in the upland of northeastern Illinois and occupies about 642,200 acres or approximately 1.8 percent of the state's land area. This soil association occurs principally in Vermilion, Champaign, Grundy, Kankakee, Will, Cook, DuPage, Lake, McHenry, and Kane counties. Its soils are mostly light colored, although it does include two moderately dark-colored prairie-forest transition soils. The soils developed in 0 to 20 inches of loess over silty clay loam glacial till. Both the loess and glacial till are of Wisconsinan glacial age, and the soils are leached and weathered to shallow depths, with lime at depths of less than 42 inches. Soil association 44 occurs near or with the dark-colored soils of association 14, and are considered to be their light-colored analogues.

The major soils in this association range from nearly level to steep; most of the landscape is sloping to strongly sloping. The major soils, Morley, Blount, Beecher, and Markham, developed under native deciduous forest.

The Morley and Blount soils form a toposequence on the landscape, with the Blount soils occupying the more level positions and the Morley soils the more sloping positions. The Blount soils are somewhat poorly drained, and the Morley soils are moderately well drained for the most part, although some are well drained. The permeability of both soils is slow to moderately slow.

The Beecher and Markham soils are included in this soil association because they developed from the same kind of parent materials as the Morley and Blount soils and share the same sequence of horizons in the soil profile. They differ from the Morley-Blount soils in having darker, thicker surface horizons. The Beecher soils occur on nearly level to sloping areas and are somewhat poorly drained. They are transitional between the Blount soils and the Elliott soils of association 14. The Markham soils occur on gently sloping to moderately steep slopes, and most are moderately well drained, although some areas are well drained. These soils are transitional between the Morley soils and the Varna soils of association 14. The permeability of both soils is slow to moderately slow.

The Chatsworth soils are minor in extent in this soil association. They are light colored, having developed under native deciduous forest on strongly sloping to very steep areas. Their permeability is very slow. They are moderately well drained, have relatively thin profiles, and usually have carbonates at less than 10 inches.

The major problem in this soil association is soil erosion. Some erosion control measures, such as terracing,

Table 37. Characteristics and Productivity Indexes of Soil Association 43 — Kidder-McHenry Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
										Supply of						
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	P	K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
25 Hennepin	12-65	6	l	2	D	6	l	Well	Mod.-mod. slow	L	M	l till	6.4	0.32	60	45
361 *Kidder*	0-35	7	sil	2	D	23	cl-scl	Well	Moderate	M	M	sl till	8.8	0.32	105	82
310 *McHenry*	0-12	13	sil	2	C	21	sicl-cl	Mod. well-well	Moderate	M	M	sl till	10.1	0.37	115	90
205 Metea	0-15	10	sl	2	D	32	scl	Well	Mod.-mod. rapid	M	L	l till	8.4	0.17	105	82
224 Strawn	5-45	7	sil	2	C	15	cl	Mod. well-well	Moderate	M	M	l till	7.9	0.37	105	82

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois,* or from county Extension and Soil Conservation Service district offices.

are sometimes difficult to apply on the sloping soils in this association because short slopes and depressions are often intermingled on the landscape. Conservation tillage is an especially useful means of erosion control. The generally slow permeability of the soils limits tiling on the soils that require drainage. On the more level areas of Beecher and Blount soils, surface drains are recommended. The relatively shallow depth to calcareous silty clay loam till limits root penetration in these soils and is largely responsible for only moderate water-holding capacities and moderate productivity. Erosion on these soils results in substantial loss of productivity. Various characteristics and the productivity indexes of the soils in association 44 are given in Table 38.

Soil Association 45

St. Clair-Nappanee-Frankfort Soils

Soil association 45 occurs in the uplands of northeastern Illinois, principally in Will, Cook, Lake, and LaSalle counties, and occupies over 149,200 acres of Illinois or approximately 0.4 percent of the state's land area. These soils are light colored and developed in less than 20 inches of loess on silty clay or clay till or lacustrine materials. All of the soil materials are of Wisconsinan glacial age. These soils are the light-colored counterparts of the dark-colored soils of both associations 16 and 17.

The major soils, St. Clair and Nappanee, form a drainage sequence on the landscape. The well to moderately well drained St. Clair soils range from gently sloping to very steep; the somewhat poorly drained Nappanee soils occur on nearly level to gently sloping areas; and the somewhat poorly drained Frankfort soils occur on nearly level to strongly sloping areas. The Frankfort soils are similar to the Nappanee soils, except that their surface horizon is darker and thicker. The Frankfort soils are transitional between the Nappanee soils and the Swygert and Clarence soils of associations 16 and 17, respectively. The largest area of the Frankfort soils is located in northeastern Will County in an area underlain by silty clay glacial till.

The moderately well drained Chatsworth soils also occur in this soil association. They are normally found on steep slopes, are frequently eroded, have a thin solum, and are calcareous at depths of less than 10 inches. All of the above-mentioned soils in this association have very slow or slow permeability.

The somewhat poorly drained Kernan soils formed in thicker loess than the other soils of association 45, but are underlain by silty clay or clay till or lacustrine material similar to that underlying association 45.

The major problems in this soil association are inadequate permeability and erosion on the areas where slopes are greater than 2 percent. Erosion control measures are often difficult to apply on soils in this area. Terracing is difficult on slopes because it tends to expose heavy-textured subsoils and parent materials that are extremely unproductive, and because short slopes and depressions are often intermingled on the landscape. Conservation tillage is an especially useful means of erosion control on these soils. The presence of the very fine textured, unweathered, and calcareous till or lacustrine material at shallow depths in these soils limits plant root penetration and is the main reason that available water and productivity are generally moderate to low. Another consequence of the shallow depth to the unfavorable subsoil is that erosion damage is especially serious and more permanent than on more favorable soils. The very slow permeability of the soils in this association limit tiling as an accepted practice where drainage is needed. On the more level areas of Nappanee and Frankfort soils, surface drains are recommended. Various characteristics and the productivity indexes of soils in association 45 are given in Table 39.

Table 38. Characteristics and Productivity Indexes of Soil Association 44 — Morley-Blount-Beecher Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
298 *Beecher*	0-6	13	sil	3.0	C	24	sic-sicl	SW. poor	Slow-mod. slow	L	M	sicl till	10.0	0.37	115	90
23 *Blount*	0-6	11	sil	2.0	C	22	sic-sicl	SW. poor	Slow-mod. slow	L	M	sicl till	9.8	0.43	105	82
241 Chatsworth	4-50	5	sic	2.0	C	12	sic-c	Mod. well	V. slow	L	M	sic, c sicl, till or lac.	4.2	0.43	45	38
531 Markham	1-18	10	sil	2.5	C	28	sic-sicl	Mod. well-well	Slow-mod. slow	L	M	sicl till	9.8	0.37	110	88
194 *Morley*	1-35	9	sil	2.0	C	26	sic-sicl	Mod. well-well	Slow-mod. slow	L	M	sicl till	9.6	0.43	105	80

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 39. Characteristics and Productivity Indexes of Soil Association 45 — St. Clair-Nappanee-Frankfort Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
241 Chatsworth	4-50	5	sic	3	C	12	sic-c	Mod. well	V. slow	L	M	sicl, sic, c till or lac.	4.2	0.43	45	38
320 *Frankfort*	1-12	11	sil	3	C	22	sic-c	SW. poor	Slow	L	M	sic, c till or lac.	7.8	0.37	95	75
554 Kernan	1-5	14	sil	2	C	28	sicl-sic	SW. poor	Mod. slow-slow	L	M	sic, c till or lac.	9.5	0.37	110	88
228 *Nappanee*	0-4	10	sil	2	C	18	c	SW. poor	V. slow	L	M	sic, c till or lac.	7.4	0.43	90	68
560 *St. Clair*	2-45	9	sil	2	C	16	c	Mod. well-well	V. slow	L	M	sic, c till or lac.	7.2	0.37	85	62

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Soil Association 46

Markland-Colp-Del Rey Soils

Soil association 46 is located primarily in the larger side valleys, the Embarras, Bonpas, Little Wabash, Skillet Fork, and Saline rivers, along the Wabash River valley in southeastern Illinois, and the Big Muddy and Kaskaskia River valleys in southwestern Illinois. Other areas of these soils occur in the Green River basin and Plum River valley in northwestern Illinois and in glacial lakebeds in Iroquois, Grundy, Cook, and Lake counties. This association occupies about 298,900 acres or 0.8 percent of the state's land area.

Soil association 46 includes light-colored soils that formed under forest in moderately fine- to fine-textured lacustrine sediments of Wisconsinan age. Except for their light-colored surfaces, these soils are comparable in many respects to the dark-colored grassland soils of associations 18 and 19, with which they normally occur and with which they share a common origin. In both the lakebeds and side valleys, quiet waters or backwaters existed long enough for fine-textured sediments to settle and form the lacustrine deposits.

The Uniontown, Reesville, and Marissa soils are largely restricted to southeastern Illinois, and are not as fine-textured in their subsoils as the other soils in this association. Reesville and Marissa can usually be tile drained satisfactorily. Although Uniontown does not require drainage improvements, the other somewhat poorly and poorly drained soils in this area do benefit from improved drainage. Because these soils have slow or very slow permeability, however, tile seldom function adequately in them, and they must be drained by means of surface ditches. The Markland, McGary, Zipp, and Bungay soils are found mostly in southeastern Illinois. In general, they are less deeply leached than the Colp, Hurst, Okaw, and Wagner soils, which occur predominantly in side valleys of the Mississippi River valley in southwestern Illinois. Niota and Zwingle soils are largely confined to side valleys of the Mississippi River valley in northwestern Illinois. The Saylesville and Del Rey soils are most extensive in glacial lakebeds in northeastern Illinois.

The major problems on these light-colored soils are drainage improvement on the somewhat poorly and poorly drained soils and maintenance of fertility, organic matter, and good physical condition. The more sloping Colp, Markland, Uniontown, and Saylesville soils have more problems with erosion than with drainage. The soils of this association generally require moderate to high applications of limestone and phosphorus and moderate amounts of potassium to produce high yields. Corn and wheat respond very well to nitrogen applications. Soybeans are also commonly grown in this association. Some areas, particularly of Okaw soils, are in forest. Most of these soils are moderately productive under high management, but their fine- to very fine-textured subsoils restrict underdrainage and root penetration. Various characteristics and the productivity indexes of the soils in association 46 are given in Table 40.

Soil Association 48

Casco-Fox-Ockley Soils

Soil association 48 occurs primarily on terrace and outwash areas along the Fox, DuPage, and Des Plaines rivers in northeastern Illinois. The larger areas are located in McHenry, western Lake, northern Cook, western DuPage, Kane, Kendall, and LaSalle counties along the Fox River and in Will County along the DuPage and Des Plaines rivers. There are small, scattered areas in Winnebago, Boone, and Ogle counties along the Rock River and other streams in northern Illinois, but

Table 40. Characteristics and Productivity Indexes of Soil Association 46 — Markland-Colp-Del Rey Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
444 Bungay	0-2	10	sicl-sic	2.0	B	40	sic	Poor	Slow	L	M	sic-sicl lac.	8.9	0.32	105	82
122 *Colp*	1-18	11	sil	2.0	C	40	sic-sicl	Mod. well	Slow	L	M	sil-c lac.	9.9	0.43	90	68
192 *Del Rey*	0-5	10	sil	2.5	C	32	sic-sicl	SW. poor	Slow	L	M	sicl-sil lac.	9.9	0.43	115	92
338 Hurst	1-6	12	sil	1.5	C	32	sic	SW. poor	Very slow	L	M	sicl-c lac.	9.2	0.43	90	70
176 Marissa	0-3	16	sil	3.5	C	35	sicl	SW. poor	Mod.-mod. slow	L	M	sil-sicl lac.	11.8	0.37	135	110
467 *Markland*	1-35	9	sil	2.0	C	22	sic	Mod. well-well	Slow	L	M	sicl-c lac.	7.6	0.43	95	72
173 McGary	0-6	10	sil	1.5	C	23	sic	SW. poor	Slow-v. slow	L	M	sicl-c lac.	7.8	0.43	95	72
261 Niota	0-3	12	sil	2.0	C	35	sic-sicl	Poor	Very slow	M	M	sil-sicl lac.	10.0	0.37	90	70
568 Niota, thin A	0-4	7	sicl	2.0	B	30	sic-sicl	Poor	Very slow	M	M	sil-sicl lac.	9.1	0.37	75	58
84 Okaw	0-5	10	sil	1.5	C	32	sic-sicl	Poor	Very slow	L	L	sicl-c lac.	8.9	0.43	85	65
723 Reesville	0-6	12	sil	2.0	C	25	sicl	SW. poor	Mod.-mod. slow	L	H	sil-sicl lac.	10.9	0.37	125	100
370 Saylesville	0-20	10	sil	2.0	C	24	sicl-sic	Mod. well-well	Mod. slow	L	M	sicl-sil lac.	9.8	0.37	105	85
482 Uniontown	0-12	10	sil	1.5	C	25	sicl	Well-mod. well	Mod.-mod. slow	L	H	sil-sicl lac.	10.8	0.37	115	92
26 Wagner	0-3	15	sil	3.0	C	32	sic-sicl	Poor	Very slow	L	L	sicl lac.	10.7	0.28	105	85
524 Zipp	0-2	10	sicl	2.0	B	28	sic	Poor	Slow-v. slow	L	M	sic-c lac.	7.7	0.28	115	90
576 Zwingle	0-2	13	sil	1.5	C	35	sic	Poor	Very slow	M	M	l-sl ow.	8.9	0.43	95	75

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois,* or from county Extension and Soil Conservation Service district offices.

these land areas are too small to be shown on the General Soil Map.

The soils in association 48 developed under forest in thin loamy and silty sediments over sandy and gravelly outwash. Many of these soils have profiles that are similar to those of the dark-colored prairie soils in association 20, and are often considered to be the light-colored, forested counterparts of those soils. The thickness of the loamy and silty sediments over sand and gravel varies from 20 to 40 inches in most of the soils of association 48. In a few soils, such as Casco and Stonington, the depth to sandy and gravelly materials is only 10 to 20 inches, and in two soils, Longlois and Ockley, the depth is somewhat more than 40 inches.

Generally, the soils of association 48 are well drained and moderately permeable in their subsoils. Only two soils, Homer and Matherton, are somewhat poorly drained and may benefit from improved drainage. Because the soils of this association are gently to strongly sloping, erosion control is often needed, especially on the more sloping areas. Other problems on these soils are maintenance of fertility and organic matter in the surface soils. Because of their fairly low clay content, some of these soils do not hold large supplies of plant nutrients and water. Application of lime and fertilizers to soils that are low in clay should be based upon the immediate needs of the crop to be grown. Improving and maintaining organic matter in the surface horizons will help these soils store more water for crops and reduce runoff and erosion. Wind erosion is sometimes a problem in dry, early springs if the soils do not have enough vegetative cover. The more sandy soils, which are lower in clay, may contribute to groundwater pollution if waste disposal systems such as septic tank absorption fields or sewage lagoons are located in them.

Corn, soybeans, and wheat are the major crops grown in soil association 48. Most of the steep areas are in pasture or timber. Where the sand and gravel deposits underlying these soils are thick, they are usually good sources of well water for irrigation of corn and soybeans. These soils also have good potential for vegetable crop production where underground water supplies are sufficient for irrigation. Various characteristics and the productivity indexes of the soils in association 48 are given in Table 41.

Soil Association 49

Martinsville-Sciotoville Soils

Soil association 49 occurs primarily on the terrace areas in the Ohio and lower Wabash River valleys. There are also small, scattered areas in a number of other counties in northeastern Illinois, but many of these areas are not shown on the General Soil Map. The soils of association 49 often occur near or with the dark-colored soils of association 21 that formed in the same kind of materials. This association occupies 101,300 acres or 0.3 percent of the state's land area.

The soils of association 49 are light colored and formed in thin silty or loamy materials on sandy, Wisconsinan outwash under forest. The well-drained Martinsville soils and the somewhat poorly drained Whitaker soils form a drainage sequence and are among the major soils in this association in northeastern Illinois. They have sandy loam or sandy clay loam subsoils and are moderately permeable. Another extensive drainage sequence comprises the well-drained Wheeling, moderately well drained Sciotoville, somewhat poorly drained Weinbach, and poorly drained Ginat soils. It occurs primarily in extreme southern Illinois where sediments were deposited by the Ohio River. One of the larger areas is in the valley now occupied by the Cache River. These soils have silt loam surface soils but loamy subsoils that are high in mica minerals. The permeability of these soils ranges from moderate in Wheeling to very slow in Weinbach and Ginat. The moderately well drained Emma soils formed in acid silty clay loam sediments that were also deposited by the Ohio River. The well to moderately well drained Grellton soils formed in 20 to 40 inches of loamy material on 15 to 30 inches of silty material on sandy loam material.

Most soils in this association have moderate water-holding capacity and are moderately productive if managed properly. Many areas have sources of water for irrigation. Erosion is a problem on sloping areas. Some wind erosion is possible on areas that are tilled or do not have enough vegetative cover in dry spring seasons. Fertility is generally low, but can be corrected if good soil testing and soil treatment programs are followed. Corn and soybeans are the main crops on these soils. Various characteristics and the productivity indexes of the soils in association 49 are given in Table 42.

Soil Association 50

Oakville-Lamont-Alvin Soils

Soil association 50 occurs in many counties around the state. The three major areas are in Kankakee and Mason counties and in the Green River lowland regions of Henry and Lee counties. Many small areas are found in the Wabash River valley. The soils of this association are located in areas where materials high in sand have been deposited either by wind or water from rivers or streams or glacial outwash. This association occupies about 467,700 acres or 1.3 percent of the state's land area.

These soils formed in sandy glacial outwash, sandy alluvium, or sandy aeolian material. In general, they are very sandy and occur on nearly level to very steep terraces and on uplands. These light-colored soils formed under deciduous forest, except for the moderately dark-

Table 41. Characteristics and Productivity Indexes of Soil Association 48 — Casco-Fox-Ockley Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
706 Boyer	0-40	12	ls	1.5	D	20	sl-scl	Well	Mod. rapid-rapid	L	L	s and g ow.	5.0	0.17	85	70
323 *Casco*	0-45	8	sil-l	2.0	C	10	l-scl	Well	Mod.-rapid	M	M	s and g ow.	4.5	0.32	90	72
346 Dowagic	0-12	10	sil	3.0	C	40	sl-cl	Well	Mod.-rapid	M	M	s and g ow.	8.1	0.28	105	85
325 Dresden	1-10	11	sil	3.0	C	24	sicl-cl	Well	Mod.-mod. rapid	M	M	s and g ow.	7.6	0.28	110	88
137 Ellison	0-10	11	sil	2.0	C	30	sicl-cl	Well	Mod.-mod. rapid	M	M	s and g ow.	7.3	0.32	105	82
327 *Fox*	1-30	10	sil	2.0	C	22	sicl-cl	Well	Mod.-mod. rapid	M	M	s and g ow.	6.9	0.32	105	82
771 Hayfield	0-3	12	l	3.0	C	28	l-cl	Mod. well SW. poor	Mod.-rapid	M	M	s and g ow.	8.3	0.32	105	85
326 Homer	0-6	10	sil	2.0	C	22	sicl-cl	SW. poor	Mod.-rapid	M	M	s and g ow.	7.1	0.37	115	92
394 Longlois	1-6	12	sil	3.0	C	45	sicl-cl	Well	Mod.-rapid	M	M	s and g ow.	11.0	0.37	130	115
342 Matherton	0-6	11	sil	3.0	C	24	scl-cl	SW. poor	Mod.-rapid	M	M	s and g ow.	7.4	0.28	120	98
387 *Ockley*	1-18	12	sil	2.0	C	45	cl-sicl	Well	Mod.-rapid	M	M	s and g ow.	11.0	0.37	125	105
253 Stonington	5-30	9	l-sl	1.5	D	15	l-sl	Well	Mod.-rapid	L	L	s and g ow.	4.7	0.24	75	60

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois,* or from county Extension and Soil Conservation Service district offices.

colored Billett soils, which developed under prairie grasses and widely scattered deciduous trees. Many of the soils in association 50 are the forested counterparts of the dark-colored, sandy soils of association 22.

The soils of this association typically have a moderate to low available-water holding capacity. Two exceptions are the poorly drained Ruark and moderately well to well drained, thick A Alvin soils, which have a high available-water holding capacity. Permeability is rapid or very rapid in the subsoil or substratum of all the soils in this association, except for the Roby, which has moderate to moderately rapid permeability in the subsoil, and the Ruark soils, which have moderately slow to moderate permeability. Surface runoff ranges from very slow to medium. The poorly drained Ruark and somewhat poorly drained Roby soils form a drainage sequence with the well and moderately well drained Alvin soils.

The Alvin, Bloomfield, Chelsea, Chute, Lamont, Oakville and Plainfield soils are nearly level to very steep and formed in aeolian sand and sandy loams. These soils range from excessively drained to well drained, and the depth to water table is greater than 6 feet. Some areas of the Alvin soils in Alexander County have a thicker surface soil than is typical (Alvin, thick A variant). The very gently sloping to moderately steep, well-drained Billett soils formed in sandy loam alluvium or glacial outwash. The nearly level to gently sloping, somewhat poorly drained Morocco soils are formed in sandy or sandy loam glacial outwash or alluvium. The depth to water table is 1 to 3 feet.

Erosion and drouthiness are the main problems with these soils. Wind erosion is frequently a problem in the spring when the soil surface is unprotected. In some areas there is also some erosion by runoff. These soils are drouthy for crops such as corn and soybeans in the late summer when there is a normal or less than normal amount of rainfall. The Ruark soils are the only soils in this association that need drainage. Surface and subsurface drainage will improve yields on Ruark, although there may be problems if tile are laid in the sandy substratum.

Except for the Roby and Ruark soils, these soils are poor filters for sewage disposal systems. If the soils are used for that purpose, the ground water may become contaminated because of the low clay content in their subsoils and consequent rapid permeability. Another result of the rapid permeability is that these soils do not hold plant nutrients well and usually require fertilization for the crop being grown. Soil treatments must sometimes be applied in smaller amounts but with more frequency than in soils with higher water- and nutrient-holding capacities.

Most areas of these soils are used for cultivated crops. Some areas have trees growing on them, and the more sloping ones are used for pasture. Some areas are irrigated; many are good sources of water from wells. The characteristics and the productivity indexes of the soil in association 50 are given in Table 43.

Soil Association 51

Ritchey-New Glarus-Palsgrove Soils

Soil association 51 occurs in northwestern Illinois and in Kankakee County in the northeastern part of the state. It often occurs with or near the dark-colored soils of association 23, which formed in similar kinds of materials. The soils in this association developed under forest vegetation and are light colored except for the moderately dark-colored Oneco, Nassett, and Backbone soils, which formed under mixed grass and scattered trees. This association occupies about 205,700 acres or 0.6 percent of the state's land area.

The soils of this association developed in silty or loamy material (loess, till, or outwash) with or without residuum on limestone at depths ranging from about 10 to more than 60 inches. In some areas in northwestern Illinois, the clayey residuum is very thick (greater than 60 inches); in others, especially in northeastern Illinois, it is absent because of erosion that occurred before the silty loess or loamy material was deposited.

All of these soils are well drained and moderately permeable except Oneco, which is well and moderately well drained, and New Glarus, which has moderate to moderately slow permeability. Available-water holding capacity is low in those soils that have limestone at depths of less than 20 inches, such as Ritchey, Dunbarton, and Dunbarton-cherty, and moderate in those with limestone at depths approaching 40 or more inches. Because these soils limit root penetration and are low in available-water holding capacity, crop yields on them are low to moderate. All of these soils tend to be sloping. As a result, erosion is a serious problem in many areas because it further reduces the thickness of the already thin rooting medium. Various properties and the productivity indexes of the soils in association 51 are given in Table 44.

Table 42. Characteristics and Productivity Indexes of Soil Association 49 — Martinsville-Sciotoville Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thick-ness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thick-ness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Supply of P	Supply of K	Sub-stratum: Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
469 Emma	0-12	8	sicl	2.0	B	48	sicl	Mod. well	Mod. slow	M	L	acid sicl ow.	11.0	0.37	110	90
460 Ginat	0-2	9	sil	1.5	C	48	sicl	Poor	V. slow	L	L	acid sicl ow.	8.9	0.43	105	82
780 Grellton	0-20	5	sl	2.0	D	42	sil-fsl	Well-mod. well	Moderate	M	M	sl-sil till	10.5	0.24	105	82
570 *Martinsville*	1-18	12	sil	2.0	C	36	cl-sicl	Well	Moderate	M	M	sl-scl ow.	10.0	0.37	115	92
462 *Sciotoville*	0-12	10	sil	2.0	C	44	sicl-sil	Mod. well	Mod. slow	L	M	sl-l ow.	9.3	0.37	105	82
461 Weinbach	0-5	15	sil	2.0	C	39	sicl-sil	SW. poor	V. slow	L	M	sicl-sl ow.	10.4	0.43	115	90
463 Wheeling	0-5	14	sil	2.0	C	36	sicl-fsl	Well	Moderate	L	M	sl, s ow.	7.6	0.32	105	82
571 Whitaker	0-6	12	sil	2.0	C	36	cl-l	SW. poor	Moderate	M	M	sl, sil ow.	10.7	0.37	120	90

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 43. Characteristics and Productivity Indexes of Soil Association 50 — Oakville-Lamont-Alvin Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thick-ness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thick-ness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Supply of P	Supply of K	Sub-stratum: Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
131 *Alvin*	1-30	18	fsl	1.0	D	26	l-sl	Well-mod. well	Mod.-mod. rapid	L	L	fs ow. & aeolian	8.4	0.24	105	85
131V Alvin, thick A	0-4	28	fsl	1.0	D	22	l-scl	Well-mod. well	Mod.-mod. rapid	L	L	fs ow. & aeolian	9.0	0.24	110	90
332 Billett	0-20	8	sl	1.5	D	47	sl	Well	Mod. rapid-rapid	L	L	s ow. & aeolian	7.6	0.20	90	72
53 Bloomfield	1-20	35	fs	1.0	D	22	fs-fsl	Well	Mod. rapid-rapid	L	L	s ow. & aeolian	6.1	0.15	85	65
779 Chelsea	0-20	34	fs	1.0	D	20	fs	Well	Rapid	L	L	s ow. & aeolian	4.5	0.17	70	55
282 Chute	5-40	10	fs	1.0	D	18	fs	Well	Rapid	L	L	s ow. & aeolian	4.0	0.15	60	45
175 *Lamont*	3-25	7	fsl	1.5	D	25	fsl	Well	Mod. rapid-rapid	L	L	lfs ow. & aeolian	7.7	0.24	105	82
501 Morocco	0-2	14	fs	1.0	D	16	fs	SW. poor	Rapid	L	L	fs-s ow. & aeolian	4.3	0.17	90	72
741 *Oakville*	0-50	7	fs	1.0	D	27	fs	Well	Rapid	L	L	fs ow. & aeolian	4.3	0.15	65	55
54 Plainfield	0-30	8	s-ls	1.0	D	12	s	Well	Rapid	L	L	s ow. & aeolian	3.5	0.17	60	48
184 Roby	0-5	10	fsl	1.5	D	22	fsl	SW. poor	Mod.-mod. rapid	L	L	lfs-fsl ow. & aeolian	8.0	0.20	105	85
178 Ruark	0-2	18	fsl	1.5	D	19	cl, scl	Poor	Mod. slow-mod.	L	L	fsl ow. & aeolian	9.5	0.24	105	82

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 44. Characteristics and Productivity Indexes of Soil Association 51 — Ritchey-New Glarus-Palsgrove Soils[a]

		Surface soil				Subsoil						Sub-stratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thick-ness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thick-ness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodi-bility factor, K	High mgmt.	Avg. mgmt.
768 Backbone	2-18	8	ls	1	D	20	sl	Well	Moderate	L	L	thin resi. on lims.	4.0	0.24	80	62
29 Dubuque	3-30	11	sil	2	C	16	sicl-sil	Well	Moderate	L	L	thin resi. on lims.	5.9	0.37	80	62
505 Dunbarton	2-45	7	sil	2	C	11	sicl	Well	Moderate	L	L	thin resi. on lims.	4.1	0.37	70	52
511 Dunbarton, chr.	2-45	8	chr. sil	2	C	11	chr. sicl	Well	Moderate	L	L	thin resi. on lims.	3.6	0.37	60	45
731 Nassett	5-20	15	sil	3	C	26	sicl	Well	Moderate	M	M	thin resi. on lims.	8.8	0.32	110	90
928 *New Glarus*	1-30	8	sil	2	C	20	sicl	Well	Mod.-mod. slow	M	M	thick c resi. on lims.	6.5	0.37	90	70
752 Oneco	1-12	7	sil	3	C	34	sicl-cl	Well-mod. well	Moderate	M	M	thin resi. on lims.	8.3	0.32	105	85
429 *Palsgrove*	2-30	8	sil	2	C	32	sicl	Well	Moderate	M	M	thin resi. on lims.	8.5	0.32	110	88
311 *Ritchey*	1-12	7	sil	2	C	10	cl	Well	Moderate	L	L	limestone	3.3	0.37	75	58
509 Whalan	0-25	9	l	2	D	18	l-cl	Well	Moderate	M	M	thin resi. on lims.	5.8	0.32	95	75
410 Woodbine	2-25	9	sil	2	C	30	sicl-cl	Well	Moderate	M	M	thin resi. on lims.	7.9	0.37	105	82

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Soil Association 52

Alford-Goss-Baxter Soils

Soil association 52 occurs in southern Illinois in counties that border the Mississippi and Ohio rivers and in other counties as well. This association occupies about 188,100 acres or 0.5 percent of the state's land area.

These soils formed under deciduous forest on steep and strongly dissected upland areas where Devonian and Mississippian limestone bedrock dominates the landforms. Outcrops of bedrock are common. The Lower Devonian rocks are predominantly siliceous limestone, dolomite, and chert. The large amount of silica appears to have originated as finely divided quartz silt or to have been a product of intensive weathering. The Mississippian rocks that influence this soil association are dominated by limestone, which in places contains interbedded planes of chert or siltstone. The entire region received a mantle of loess, which varies from very thin on most steep slopes to as much as 20 feet or more on the crests of ridges.

The well-drained, moderately permeable Goss soils formed in the clayey residuum from cherty limestone on side slopes. They contain chert fragments throughout and have a clayey subsoil. The well-drained, moderately rapidly permeable Clarksville and Bodine soils formed in residuum weathered from the more siliceous cherty limestones. They have a high content of chert fragments throughout and contain a moderate amount of clay in the subsoil. The well-drained, moderately permeable Alford soils formed in thick loess on the crests of ridges. Baylis soils formed partly in 20 to 40 inches of loess and partly in thick, cherty residuum weathered from limestone and occur in narrow areas along the middle or upper parts of slopes. The moderately well drained Bedford soils have a dense and brittle fragipan horizon. They are silty clay or clay in the lower part of the solum. They are moderately permeable above the fragipan and very slowly permeable in and beneath it. The well-drained, moderately permeable Baxter soils formed in cherty residuum weathered from limestone and have a high clay content in the subsoil.

The moderately well drained Muren soils and somewhat poorly drained Iva soils formed in thick loess on ridgetops or nearly level and gently sloping parts of the landscape. They form a drainage sequence with the well drained Alford soils. These three soils also occur in thick loess on ridgetops and nearly level areas in associations 33 and 53.

The major problems on these soils are low available-water storage capacity (except on the soils that formed in loess), low fertility, and susceptibility to erosion. Their surface layer is low in organic matter. In many areas the variable size and irregular shape of fields on narrow ridgetops often hinders the use of large machinery. The use of many other areas is limited by the steep slopes and high content of coarse fragments.

Most of these soils respond well to good management. The soils that formed in thick loess are among the most productive upland soils of southern Illinois. The steep areas are in forest, as are some of the very narrow ridgetops. Many of the ridgetops and sloping hillsides have been cleared and are used for hayland, meadow, or cropland. The soils on steep, cherty hillsides are very low in productivity. Various characteristics and the productivity indexes of soils in association 52 are given in Table 45.

Soil Association 53

Alford-Wellston Soils

Soil association 53 occurs in southern Illinois in several counties along the Mississippi and Ohio rivers. It occupies about 116,400 acres or 0.3 percent of the state's land area.

The soils in this association formed under deciduous forest on steep and strongly dissected upland areas where the shape of the landscape is determined by the bedrock. The bedrock is predominantly sandstone, with interbedded layers of siltstone and shale. Outcrops of bedrock are common, and many hillsides are broken by rock escarpments or strewn with boulders and talus. The region in which these soils occur received a mantle of loess that varies from very thin on steep slopes to as much as 20 feet or more thick on the crests of some ridges. In general, these soils are well drained, although some of the associated soils that formed in loess are moderately well drained or somewhat poorly drained.

The well-drained, moderately permeable Alford soils formed in loess. They commonly occur on the upper parts of slopes and on ridgetops. They have silty clay loam subsoil and lack coarse fragments. The well-drained, moderately permeable Wellston soils formed in 20 to 40 inches of loess and residuum weathered from sandstone, siltstone or shale. They are silt loam or silty clay loam in the upper part of the solum and are loamy and contain coarse fragments in the lower part. They are the dominant soil on the slopes in many parts of this soil association. The well-drained Westmore soils also formed in 20 to 40 inches of loess and loamy residuum, with limestone at depths of more than 48 inches. The well drained Berks, Muskingum, and Neotoma soils are located on the most rugged parts of the topography. They formed in residuum weathered from interbedded siltstone, sandstone, and shale. Berks soils contain more than 35 percent coarse fragments in the subsoil and Muskingum contains between 10 and 30 percent. Neotoma soils contain more than 35 percent coarse fragments in the subsoil and have a more highly developed subsoil than Berks soils. Zanesville soils formed in 24 to 48 inches of loess over residuum weathered from interbedded sandstone, siltstone, and shale. They have a fragipan horizon in the lower part of the subsoil.

The moderately well drained Muren soils and the somewhat poorly drained Iva soils formed in thick loess and are nearly level or gently sloping. They form a drainage sequence with the well drained Alford soils, and also occur in associations 33 and 52.

The major problems on these soils are low available-water holding capacity in soil layers that contain coarse fragments or fragipan horizons, low fertility, low organic matter in the surface layer, and susceptibility to erosion. The rock escarpments, steep slopes, and rugged topography limit the use of many areas. The irregular size and shape of fields on the narrow ridgetops hinder the use of large machinery on many farms.

Table 45. Characteristics and Productivity Indexes of Soil Association 52 — Alford-Goss-Baxter Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
308 *Alford*	1-40	9	sil	2	C	40	sicl	Well	Moderate	M	M	sil loess	12.0	0.37	125	100
599 *Baxter*	2-30	9	chr. sil	2	C	51	chr. sicl-c	Well	Moderate	L	L	chr. c resi. on lims.	7.6	0.32	50	40
472 Baylis	8-30	9	sil	2	C	51	sicl-chr. sicl	Well	Moderate	L	L	chr. c resi. on lims.	8.6	0.37	95	75
598 Bedford	1-7	9	sil	2	C	51	sicl-c	Mod. well	Slow-v. slow	L	L	sic-c resi. on lims.	8.7	0.43	75	58
471 Bodine	4-60	8	chr. sil	2	C	52	v. chr. sicl-sic	Well	Mod. rapid	L	L	chr. sic-c resi. on lims.	5.1	0.28	35	30
471 Clarksville	2-60	13	chr. sil	2	C	47	v. chr. sicl-sic	Well	Mod. rapid	L	L	chr. sic-c resi. on lims.	5.3	0.28	35	30
606 *Goss*	2-45	19	chr. sil	2	C	41	chr. sic	Well	Moderate	L	L	chr. sic-c resi. on lims.	7.2	0.24	50	38
454 Iva	1-4	13	sil	2	C	36	sicl	SW. poor	Slow	M	M	sil loess	12.1	0.43	135	108
453 Muren	1-6	11	sil	2	C	36	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	130	102

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.

[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

The steep and rocky parts of this association are predominantly wooded. Many other parts, particularly the ridgetops and upper parts of side slopes, are cleared and used for cropland. Corn, soybeans, wheat, milo, and hay are the principal crops. These soils respond well to good management. The Alford, Muren, and Iva soils, which formed in thick loess on ridgetops, are among the most productive soils of southern Illinois. Various characteristics and the productivity indexes of the soils in association 53 are given in Table 46.

Soil Association 54

Hosmer-Zanesville-Berks Soils

Soil association 54 occurs in a number of counties in extreme southern Illinois in the region of the Ozark uplift that extends across the southern part of the state. This association is beyond the limit of continental glaciation, and its topography is determined by the bedrock. It occupies about 489,800 acres or 1.4 percent of the state's land area.

This association occurs on rough, sloping, and dissected uplands. The slopes range from nearly level to steep. Outcrops of bedrock, rock escarpments, and talus boulders are common in many places. Many areas of this association are located on the sides of entrenched drainageways. Good drainage of the landforms is afforded by the streams and tributaries. The bedrock is primarily interbedded sedimentary rocks of Pennsylvanian or Mississippian age. The strata are broken by a complex of faults and have been tilted by the sinking of the central part of the basin. Hicks Dome, a prominent feature in this association, is probably the result of a deep igneous intrusion. Some cretaceous rocks on the coastal plains and some Pleistocene materials in the form of loess and till are also included in this area. The soils formed under deciduous forest and are light colored.

The moderately well drained Hosmer soils are in a drainge sequence with the well drained Wartrace, somewhat poorly drained Stoy and poorly drained Weir soils. Hosmer and Stoy soils, which are among the major soils of this association, occur in areas that have about 7 to 12 feet of loess over residuum weathered from interbedded sandstone, siltstone, or shale. This drainage sequence also occurs in association 35, which is underlain by till rather than bedrock.

Zanesville, Wellston, and Westmore soils occur in the more sloping areas where the loess is thinner. These soils formed in both loess and the underlying residuum weathered from stratified sandstone, siltstone, and shale. Zanesville and Lax soils contain a dense, brittle fragipan horizon in the lower part of the subsoil that restricts root growth and water movement. Hosmer and Stoy soils also have a restrictive horizon. The well-drained Berks, Muskingum, and Neotoma soils occur on the most rugged parts of the topography. They formed in residuum weathered from interbedded siltstone, sandstone, and shale. Both Berks and Neotoma soils contain more than 35 percent coarse fragments in the subsoil, but Neotoma soils have a more highly developed subsoil than Berks soils. Muskingum soils contain between 10 and 30 percent coarse fragments in the subsoil. The well drained Beasley soils formed in calcareous shale or limestone and have clayey subsoil. The moderately well drained Lax soils and the well drained Brandon and Saffell soils formed in the gravelly coastal plains sediments. Brandon and Lax soils contain a component of loess or silty material in the upper part.

The major problems on these soils are susceptibility to erosion, low organic matter in the surface layer, low fertility, and low available-water holding capacity in soil layers that contain coarse fragments or fragipan horizons. Rock escarpments, steep slopes, and rugged topography limit the use of many areas. The fields of irregular size and shape on the more narrow ridgetops are often difficult to farm with large farm machinery.

Most of the sides of the incised drainageways and the steep and rocky parts of this association are wooded. Many other parts are cleared and used for cropland, including ridge crests, upper parts of side slopes and some sloping benched areas between escarpments. Corn, soybeans, wheat, milo, and hay are the principal crops; some areas are used for pasture. These soils respond well to good management. Various characteristics and the productivity indexes of the soils in association 54 are given in Table 47.

Soil Association 55

Grantsburg-Zanesville-Wellston Soils

Soil association 55 occurs in relatively small areas in several counties of extreme southern and southeastern Illinois. The topography of these areas is determined by bedrock, and glaciation has had little or no effect on them. They occur on high domes of bedrock, and are dissected by the major drainage network. Association 55 occupies about 388,000 acres or 1.1 percent of the state's land area.

This association is located on dissected and sloping uplands, and most of it is covered with a mantle of loess ranging from very thin to as much as 7 feet thick. The loess is thickest on the crests of the ridges and thinner on the secondary point ridges and sides of the hills. The underlying bedrock is primarily interbedded sedimentary rocks. Rock outcrops or rock escarpments occur in many places. The areas are afforded good drainage by the sloping topography and the network of streams and tributaries. Slopes range from nearly level to steep. The

Table 46. Characteristics and Productivity Indexes of Soil Association 53 — Alford-Wellston Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thickness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thickness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Subsoil: Supply of P	Subsoil: Supply of K	Substratum: Texture and material	Available water to 60 inches, in.	Erodibility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
308 *Alford*	1-40	9	sil	2	C	40	sicl-sil	Well	Moderate	M	M	sil loess	12.0	0.37	125	100
955, 986 } Berks	3-45	10	l	2	D	16	sh l-l	Well	Mod.-mod. rapid	L	L	sh-l resi. on ss, sis, sh	4.9	0.24	35	30
454 Iva	1-4	13	sil	2	C	36	sicl	SW. poor	Slow	M	M	sil loess	12.1	0.43	135	108
453 Muren	1-6	11	sil	2	C	36	sicl	Mod. well	Mod. slow	M	M	sil loess	12.1	0.37	130	102
425 Muskingum	5-70	11	stony sil	2	D	21	sil, ch sil	Well	Moderate	L	L	ch sil-l resi. on ss, sis, sh	5.9	0.28	35	30
976, 977 } Neotoma	6-35	9	stony sil	2	D	31	ch sil	Well	Mod. rapid	L	L	fl l resi. on sis, ss	7.0	0.20	35	30
339 *Wellston*	0-35	7	sil	2	C	29	sicl-sil, ch l	Well	Moderate	L	L	ch l resi. on sis, ss, sh	8.2	0.37	70	50
940 Westmore	2-50	6	sil	2	C	54	sicl-c	Well	Mod.-slow	L	L	c resi. on ss, sis, sh, lims.	9.2	0.37	90	72
340 Zanesville	0-20	7	sil	2	C	32	sicl, sil, l	Well-mod. well	Mod.-slow	L	L	scl resi. on ss, sis, sh	8.7	0.37	85	65

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Table 47. Characteristics and Productivity Indexes of Soil Association 54 — Hosmer-Zanesville-Berks Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thickness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thickness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Subsoil: Supply of P	Subsoil: Supply of K	Substratum: Texture and material	Available water to 60 inches, in.	Erodibility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
691 Beasley	2-20	7	sil	2.0	C	22	sic, c	Well	Mod. slow	L	L	c, sic resi. on calc. sis, sh, lims.	8.8	0.43	60	45
955, 986 } *Berks*	3-45	10	l	2.0	D	16	sh l-l	Well	Mod.-mod. rapid	L	L	sh l resi. on ss, sis, sh	4.9	0.24	35	30
956 Brandon	2-30	9	sil	2.0	C	21	sil, sicl	Well	Mod.-mod. rapid	L	L	gl sl on coastal plains gl mat.	8.5	0.37	85	68
214 *Hosmer*	1-25	12	sil	1.5	C	40	sicl-sil	Mod. well	Mod.-slow	L	M	sil loess	11.1	0.43	115	88
628 Lax	2-12	7	sil	2.0	C	53	sicl-gl cl	Mod. well	Mod.-slow	L	L	gl cl on coastal plains gl mat.	8.3	0.43	80	65
425 Muskingum	5-70	11	stony sil	2.0	D	21	sil, ch sil	Well	Moderate	L	L	ch sil-l resi. on ss, sis, sh	5.9	0.28	35	30
976, 977 } Neotoma	6-35	9	stony sil	2.0	D	31	ch sil	Well	Mod. rapid	L	L	fl l resi. on sis, ss	7.0	0.20	35	30
956 Saffell	1-30	8	gl sil	2.0	D	42	gl scl	Well	Moderate	L	L	gl sl on coastal plains gl mat.	5.6	0.28	60	48
164 Stoy	0-10	13	sil	2.0	C	35	sicl	SW. poor	Slow	L	M	sil loess	10.9	0.43	115	90
215 Wartrace	1-30	10	sil	2.0	C	30	sicl	Well	Mod.-mod. slow	M	M	sil loess on lims.	10.9	0.37	120	92
165 Weir	0-3	16	sil	2.0	C	30	sicl	Poor	V. slow-slow	L	L	sil loess	11.0	0.43	110	85
339 Wellston	0-35	7	sil	2.0	C	29	sicl, sil, ch l	Well	Moderate	L	L	ch l resi. on sis, ss, sh	8.2	0.37	70	50
940 Westmore	2-50	6	sil	2.0	C	54	sicl-c	Well	Mod.-slow	L	L	c resi. on ss, sis, sh, lims.	9.2	0.37	90	72
340 *Zanesville*	2-20	7	sil	2.0	C	32	sicl, sil	Well-mod. well	Mod.-slow	L	L	s cl resi. on ss, sis, sh	8.7	0.37	85	65

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

soils formed under deciduous forest and are light colored.

The moderately well drained Grantsburg soils and the somewhat poorly drained Robbs soils form a drainage sequence. The Grantsburg soils, which are among the major soils in this association, formed in loess and contain root-restricting fragipan horizons in the lower part of the subsoil. They generally occur on the crests of the ridges. The well-drained and moderately well drained Zanesville soils and the well-drained Wellston soils are located on the lower secondary ridges and on the side slopes where the loess is thinner. They formed in both the loess and the underlying residuum weathered from stratified sandstone, siltstone, and shale. The Zanesville soils also contain a fragipan horizon. The well drained Berks, Muskingum, and Neotoma soils occur on the more rugged parts of the topography, commonly on the lower parts of the slopes. They formed in residuum weathered from interbedded siltstone, sandstone, and shale. Berks and Neotoma soils both contain more than 35 percent coarse fragments in the subsoil, but Neotoma soils have a more highly developed subsoil than Berks. Muskingum soils formed in materials similar to those of Berks and Neotoma, but contain between 10 and 20 percent coarse fragments in the soil. The well-drained Beasley soils formed in calcareous shale or limestone and have clayey subsoils.

The major problems on these soils are susceptibility to erosion, low organic matter in the surface layer, low fertility, and low available-water holding capacity in soil layers that contain coarse fragments or fragipan horizons. The steep slopes, rock outcrops, and rock escarpments limit the use of many areas. Irregularly sized and shaped fields on narrow ridgetops hinder use of large farm machinery in much of this association.

Many of the steep and rocky areas are in woodland. Many of the nearly level to moderately steep areas have been cleared and used for cropland. The principal crops are corn, milo, wheat, and hay, although some areas are used for pasture. These soils respond well to good management. Some areas are idle and host a succession of plants as the areas revert to woodland. Various characteristics and the productivity indexes of soils in association 55 are given in Table 48.

Soil Association 56

Derinda-Schapville-Eleroy Soils

Soil association 56 occurs in several counties in north central and northwestern Illinois. It occupies about 89,100 acres or 0.3 percent of the state's land area.

The soils in this association occur on nearly level to very steep uplands, many on the steep side slopes of ravines or other drainageways. They formed in thin to moderately thick loess or medium-textured drift on either shale or sandstone, with interbedded limestone in a few areas. Some of these soils formed under grass and are dark colored, others under forest and are light-colored. The soils range from very poorly drained to well drained.

The well-drained and moderately well drained Derinda and Schapville soils formed in about 15 to 30 inches of loess and in the underlying clayey residuum weathered from calcareous shale. They have silty clay loam texture

Table 48. Characteristics and Productivity Indexes of Soil Association 55 — Grantsburg-Zanesville-Wellston Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
691 Beasley	2-20	7	sil	2.0	C	22	sic, c	Well	Mod. slow	L	L	c, sic resi. on calc. sis, sh, lims.	8.8	0.43	60	45
955, 986 Berks	3-45	10	l	2.0	D	16	sh l-l	Well	Mod.-mod. rapid	L	L	sh l resi. on ss, sis, sh	4.9	0.24	35	30
301 *Grantsburg*	2-15	7	sil	1.5	C	45	sil-sicl	Mod. well	Mod.-v. slow	L	L	sil loess on ss, sis, sh	9.4	0.43	105	80
425 Muskingum	5-70	11	stony sil	2.0	D	21	sil, ch-sil	Well	Moderate	L	L	ch sil-l resi. on ss, sis, sh	5.9	0.28	35	30
976, 977 Neotoma	6-35	9	stony sil	2.0	D	31	ch sil	Well	Mod. rapid	L	L	fl l resi. on sis, ss	7.0	0.20	35	30
335 Robbs	0-3	13	sil	2.0	C	36	sicl-sil	SW. poor	Slow-v. slow	L	L	sil loess on ss, sis, sh	9.9	0.43	105	80
339 *Wellston*	0-35	7	sil	2.0	C	29	sicl, sil ch l	Well	Moderate	L	L	ch l resi. on sis, ss, sh	8.2	0.37	70	50
340 *Zanesville*	2-20	7	sil	2.0	C	32	sicl, sil	Well-mod. well	Moderate-slow	L	L	scl resi. on ss, sis, sh	8.7	0.37	85	65

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

in the upper part of the subsoil and silty clay or clay in the lower part. The light-colored Derinda soils formed under forest and the dark-colored Schapville under prairie grass. The somewhat poorly drained Shullsburg and the poorly drained Calamine soils form a drainage sequence with Schapville soils and developed in similar materials. The well-drained and moderately well drained Keltner, Massbach, and Eleroy soils formed in about 30 to 50 inches of loess and in residuum weathered from shale. They are clayey in the lower part of the subsoil. The light-colored Eleroy soils formed under forest, the dark-colored Keltner soils under prairie grass, and the moderately dark Massbach soils under both forest and prairie grass in transition zones. The somewhat poorly drained, moderately dark Ridott soils form a drainage sequence with Massbach soils and developed in similar materials. The somewhat poorly drained Loran and poorly drained Calamine soils form a drainage sequence with Keltner soils.

The moderately well drained Gosport soils formed in residuum weathered from acid shale and contain little or no loess on the surface. They have a high content of clay in the subsoil, but the development of their subsoil is not strongly expressed. They occur mostly on the lower part of slopes along incised drainageways. The well-drained and moderately well drained, light-colored Marseilles series formed under forest in about 15 to 30 inches of loess and in the underlying residuum weathered from acid shale, and contain more clay in the lower part of the subsoil than in the upper part. These soils were mapped in LaSalle County. A somewhat poorly drained variant, Marseilles gray subsoil, was also mapped in similar materials. The well-drained and moderately well drained High Gap soils and the somewhat poorly drained Shadeland soils formed in thin (less than 10 inches) loess, glacial drift, and residuum weathered from acid, stratified sandstone, siltstone, and shale. They formed under forest and are light colored. They are mapped in Rock Island and Grundy counties. The well- or excessively drained Boone and Eleva soils formed in residuum weathered from sandstone. They occur in Ogle County. The sandy Boone soils are also located in LaSalle County. The light-colored, well-drained Gale soils formed in 18 to 36 inches of loess and in residuum weathered from acid sandstone under forest. They are located in Carroll and LaSalle counties. The dark-colored, well-drained Hesch soils formed in loamy residuum weathered from acid sandstone under grass. They are located in LaSalle County. Two variants of the Hesch soils are also recognized; one is thin to sandstone bedrock and the other poorly drained.

The major problems on these soils are steep slopes, generally shallow depths to bedrock, low available-water holding capacity, and low fertility. The high clay content of the soils formed in residuum weathered from shale, and the generally low clay content of the soils formed in residuum weathered from sandstone contribute to the lower available-water holding capacity and low fertility of these soils. Steep areas along ravines are very susceptible to erosion.

These soils are predominantly in pasture or woodland or are idle. Although some areas are in cropland, most are too steep for that use. These soils are not highly productive but respond favorably to good management practices, especially the ones that have thicker loess covers. Various characteristics and the productivity indexes of the soils in association 56 are given in Table 49.

Soil Association 57

Haymond-Petrolia-Karnak Soils

Soil association 57 occurs in large and small floodplains in the southern half of Illinois, and in the western and northwestern parts of the state in floodplains draining areas of light-colored soils. This association occupies about 1,738,700 acres or 4.9 percent of the state's land area.

These soils formed in stratified clayey to sandy alluvium under deciduous forests. They are all low to medium in organic matter content, and all have light-colored surfaces. Most are nearly level but some are gently sloping.

Haymond soils are well drained and form a drainage sequence with the somewhat poorly drained Wakeland soils and the poorly drained Birds soils. All of these soils formed in silty soil materials. Haymond and Wakeland soils are moderately permeable and Birds soils moderately slowly permeable. Haymond soils usually occur on natural levees and higher in the floodplain than Wakeland soils. Birds soils are located in the lower parts of the floodplain. The well and moderately well drained Sharon soils form a drainage sequence with the somewhat poorly drained Belknap soils and the poorly drained Bonnie soils. This sequence is similar, except for being more acid, to the Haymond, Wakeland, and Birds sequence. All of these soils formed in silty alluvium. The moderately permeable Sharon soils occur on nearly level and gently sloping natural levees and higher parts of the floodplain. Belknap soils are located on nearly level and gently sloping parts of the floodplain and are moderately to moderately slowly permeable. Bonnie soils occur on nearly level or depressional parts of the floodplain; they are moderately slowly permeable. Arenzville soils, which are well and moderately well drained, form a drainage sequence with the somewhat poorly drained Orion soils. These soils

Table 49. Characteristics and Productivity Indexes of Soil Association 56 — Derinda-Schapville-Eleroy Soils[a]

		Surface soil				Subsoil						Substratum			Productivity index[b]	
No. and name of soil series	Slope range, %	Avg. thickness, in.	Texture	Avg. OM in plow layer, %	Lime group	Avg. thickness, in.	Texture	Natural drainage	Permeability	Supply of P	Supply of K	Texture and material	Available water to 60 inches, in.	Erodibility factor, K	High mgmt.	Avg. mgmt.
397 Boone	2-40	3	lfs	1.5	D	4	fs	Well	Rapid	L	L	san. resi. on ss	4.4	0.15	50	42
746 Calamine	0-12	20	sil	4.0	B	20	sicl-sic	Poor	Slow-v. slow	L	L	sic-c resi. on calc. sh	9.4	0.28	115	88
417 *Derinda*	4-12	7	sil	2.0	C	18	sicl-sic	Mod. well-well	Slow-v. slow	L	L	sic-c resi. on calc. sh	5.5	0.43	80	62
547 *Eleroy*	2-30	12	sil	2.0	C	29	sicl-sic	Mod. well-well	Mod.-slow	L	L	sic-c resi. on calc. sh	8.7	0.37	105	80
761 Eleva	2-35	5	sl	1.5	D	25	sl	Well	Mod.-mod. rapid	L	L	fs-sl on ss	6.8	0.24	65	50
413 Gale	2-60	8	sil	2.0	C	21	sil-sicl	Well	Mod.-mod. rapid	L	L	l-sl on ss	8.5	0.37	85	68
551 Gosport	5-45	7	sil	2.0	C	20	sic-c	Mod. well	Very slow	L	L	c resi. on sh	6.9	0.43	60	45
390 Hesch	2-45	12	fsl	3.0	C	20	sl-l	Well	Mod.-mod. rapid	L	L	san. resi. on ss	6.4	0.20	100	78
389 Hesch, thin to ss	0-5	5	ls	3.0	C	2	ls	Well	Rapid	L	L	sandstone	2.0	0.20	50	40
537 Hesch, gray subs	0-5	13	fsl	4.0	C	24	sl-l	Poor	Mod. or mod. rapid	L	L	San. resi. on ss	7.1	0.20	115	95
556 High Gap	1-12	7	l	2.0	C	27	cl-scl	Well-mod. well	Moderate	L	L	sl resi. on ss, sh, sis	7.2	0.37	100	78
546 Keltner	2-15	13	sil	3.5	B	28	sicl-sic	Mod. well-well	Mod.-slow	L	L	sic-c resi. on calc. sh	8.8	0.32	110	88
572 Loran	1-10	13	sil	4.0	B	32	sicl-sic	SW. poor	Mod. slow	L	L	sic-c resi. on calc. sh	9.5	0.28	120	95
549 Marseilles	1-15	11	sil	2.0	C	28	sicl-sic	Mod. well-well	Mod.-slow	L	L	cl resi. on sh	10.5	0.37	105	82
393 Marseilles, gray subs.	0-4	10	sil	2.0	C	33	sic	SW. poor	Mod. slow	L	L	cl resi. on sh	9.6	0.37	85	68
753 Massbach	1-15	11	sil	3.0	C	35	sicl-sic	Well-mod. well	Mod.-slow	L	L	sic-c resi. on calc. sh	9.5	0.32	105	82
743 Ridott	1-10	11	sil	3.0	C	33	sicl-sic	SW. poor	Mod.-v. slow	L	L	sic-c resi. on calc. sh	8.9	0.32	110	90
418 *Schapville*	2-20	12	sil	3.5	B	15	sicl-sic	Mod. well-well	Mod. v. slow	L	L	sic-c resi. on calc. sh	6.3	0.32	90	72
555 Shadeland	0-6	10	l	2.0	C	23	sicl-cl	SW. poor	Mod. slow	L	L	sl resi. on ss, sh, sis	8.5	0.37	105	82
745 Shullsburg	1-25	17	sil	3.0	B	20	sicl-sic	SW. poor	Mod.-v. slow	L	L	sic-c resi. on calc. sh	8.0	0.32	115	90

[a] See abbreviations at end of Key to Illinois Soils, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

are light colored and silty in the upper part and dark colored and silty or moderately fine-textured in the lower part. Arenzville and Orion soils are moderately permeable and nearly level, although Arenzville soils commonly occur in higher parts of the floodplain.

The well-drained Genesee soils form a drainage sequence with the somewhat poorly drained Shoals soils. These soils formed in silty and loamy alluvium that is calcareous in the lower part. They are moderately permeable and nearly level. The well and moderately well drained Juneau soils form a drainage sequence with the poorly drained Washtenaw soils. These soils formed in silty or loamy alluvium and underlying glacial drift. Juneau soils are located on nearly level and gently sloping parts of the landscape. They are moderately permeable. Wastenaw soils occur on nearly level parts of the landscape and are moderately slowly or slowly permeable.

Banlic soils are somewhat poorly drained and formed in silty alluvium. They are located on nearly level parts of the floodplain, are slowly permeable, and have dense layers in the lower part. Bungay soils are poorly drained and slowly permeable. Burnside soils are well and moderately well drained, formed in silty alluvium in the upper part and flaggy loam in the lower part, and are moderately permeable. They occur on nearly level and gently sloping parts of the floodplain. The poorly drained Cape soils formed in moderately fine-textured alluvium over clayey alluvium. They are slowly or very slowly permeable and are located on nearly level parts of the floodplain.

Dorchester soils are well and moderately well drained. They formed in light or moderately dark, calcareous, silty alluvium. These soils have moderate permeability. They are on nearly level parts of the floodplain. Dorchester soils, cobbly subsoil variant, are well drained. They formed in calcareous silty alluvium in the upper part and cobbly loam in the lower part. These soils are located on nearly level parts of the floodplain and are moderately permeable. Dupo soils are somewhat poorly drained. They formed in silty alluvium over clayey

...ick loess (> 60 inches)

II Moderately thick to thin loess (10-60 ± inches) on Illinoian drift with or without paleosols

III Moderately thick to thin loess (20-60 inches) on Aeolian, Wisconsinan loamy sands or sands

IV Moderately thick loess (40-60 inches) on medium- to fine-textured, Wisconsinan till or lacustrine sediments

V Moderately thick to thin loess or silty material (24-60 ± inches) on medium-textured, Wisconsinan outwash

VI Thin loess (10-40 inches) on loam or sandy loam, Wisconsinan till

VII Thin loess (< 20 inches) on silty clay loam, Wisconsinan till or lacustrine sediments

VIII Thin loess (< 20 inches) on silty clay or clay, Wisconsinan till or lacustrine sediments

IX Loamy, silty, and clayey, Wisconsinan lacustrine sediments

X Thin loamy or silty materials on gravelly, Wisconsinan outwash

XI Thin silty or loamy materials on sandy and loamy, Wisconsinan outwash

XII Thick sandy, Wisconsinan outwash and Aeolian materials

XIII Thin to thick loess or loamy materials with or without residuum on limestone

XIV Thin to thick loess or loamy materials with or without residuum on interbedded sandstone, siltstone, and shale

XV Sandy to clayey alluvial sediments on bottomlands

XVI Organic materials (peats and mucks). Not shown on map.

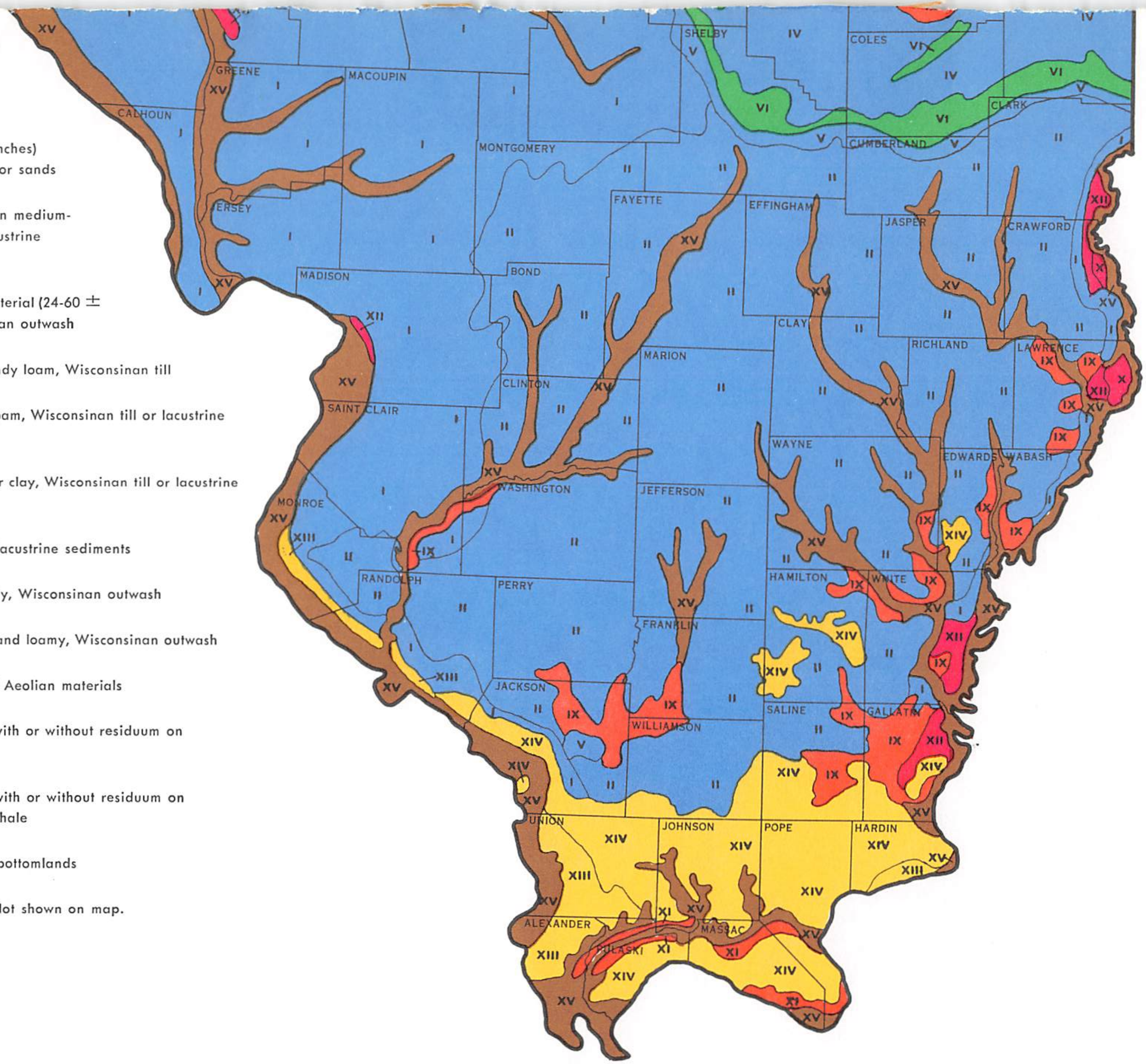
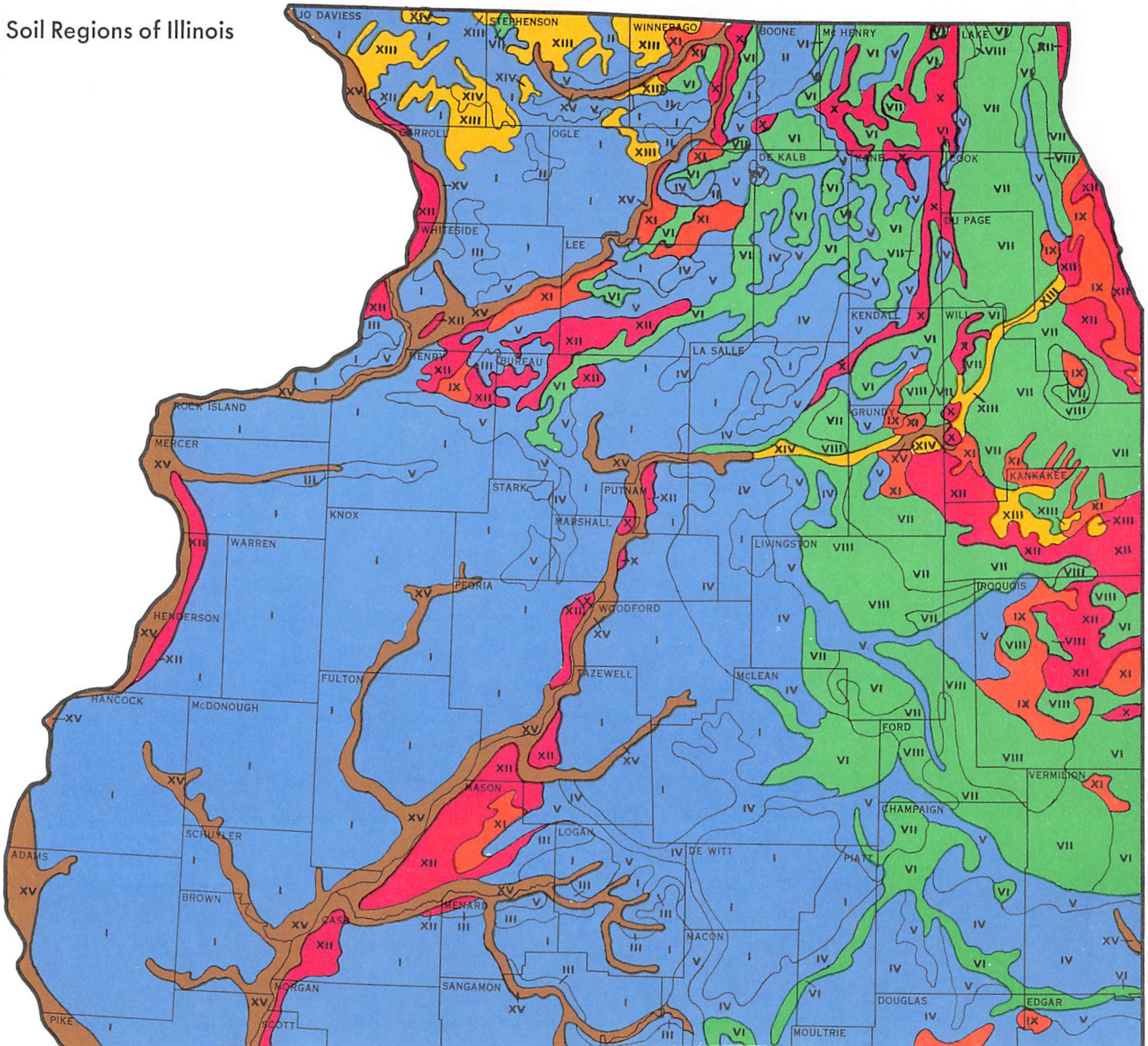


Figure 2. Parent Material Soil Regions of Illinois



alluvium, are moderately slowly to slowly permeable, and occur on nearly level parts of the floodplain. Elsah soils are well or somewhat excessively drained. They formed in silty and cherty loam alluvium, are moderately or moderately rapidly permeable, and occur on nearly level and gently sloping parts of the floodplain. Jacob soils are poorly or very poorly drained, formed in very clayey alluvium and are very slowly permeable. These soils are located on nearly level or depressional parts of the floodplain. The well and moderately well drained Jules soils formed in calcareous silty alluvium, are moderately permeable, and occur on nearly level parts of the floodplain. Poorly drained Karnak soils formed in acid, clayey alluvium. They are often located in sloughs and swales and are slowly to very slowly permeable. The poorly drained Petrolia soils formed in moderately fine-textured, slightly acid alluvium. They are moderately slowly permeable and occur on nearly level parts of the floodplain. Piopolis soils are poor and very poorly drained. They formed in moderately fine-textured, strongly acid alluvium, are slowly permeable, and occur on nearly level parts of the floodplain. The excessively drained Sarpy soils formed in calcareous sandy alluvium, are rapidly or very rapidly permeable, and occur on gently sloping or sloping parts of the floodplain. Stonelick soils are well drained and formed in calcareous sandy and silty alluvium. They are moderately rapidly permeable and occur on nearly level parts of the floodplain. The very poorly drained Wallkill soils formed in silty or sandy alluvium over organic soil materials. They are moderately or rapidly permeable and are located on nearly level or depressional parts of the floodplain.

The major problems on these soils are flooding, wetness, and low organic matter content in the surface soil. Other problems on some of these soils are clayey surface textures and slow or very slow permeability.

Most areas of these soils are cultivated, except where the floodplains are narrow or where they are cut up by streams or flood frequently. Some areas are protected from flooding by levees. The principal crops are corn and soybeans; some small grains are grown in areas that are protected from flooding. These soils respond well to good management. The wet soils can be drained by tile or surface ditches. However, in the fine-textured soils, such as Karnak and Jacob, tile do not function adequately. Various characteristics and the productivity indexes of the soils in association 57 are given in Table 50, page 66.

DEVELOPMENT OF ILLINOIS SOILS

The development of Illinois soils has been determined primarily by soil parent materials, climate, vegetation, relief and natural drainage, and time. Some of the above factors may have been altered by artificial drainage, clearing, irrigation, cultivation, and fertilization, but these practices (with the exception of excavating and land filling) have not greatly influenced soil development in Illinois.

The most important kind of excavating and land filling or soil disturbance currently taking place in the state is surface mining for coal. Soils and geological materials (overburden above coal veins) are first removed and then replaced after the coal layers have been hauled away to a coal processing center. The surface mining industry is under strict regulations to leave mined and reclaimed areas with high potential for producing crops commonly grown in that area. Because surface mining and reclamation disturb or mix the soil thoroughly, they initiate what is essentially a new cycle of soil formation.

By 1982 about 220,000 acres had been surface-mined in Illinois. Most of this acreage is in the southern, southwestern, and western parts of the state. Partly because several thousand acres are surface-mined in Illinois each year, these areas of disturbed soils are not shown on the General Soil Map of Illinois. Information on surface mining in Illinois is available from the Illinois State Department of Mines and Minerals in Springfield, Illinois.

Illinois is located in the central or midwestern part of the United States between 87.5 and 91.5 degrees west longitude and 37 and 42.5 degrees north latitude. The state is in the south central part of the north central states, and is nearly 400 miles in length from north to south and about 200 miles at its maximum width from west to east. Illinois has a lower mean elevation than the surrounding states of Indiana, Wisconsin, Iowa, Missouri, and Kentucky. Its elevation ranges from 268 feet at the southern tip to 1,241 feet above sea level at Charles Mound in Jo Daviess County in the northwestern part of the state. Mean elevation is about 600 feet above sea level.

The relatively low elevation of Illinois and its location near the confluence of the major drainage lines in the Midwest probably influenced the direction and extent of the various ice sheets that moved down from the north during glacial times and greatly influenced the development of present-day soils. The Mississippi River is on the west side of the state, the Ohio River on the south, the Wabash River on the southeast, and Lake Michigan on the northeast. The Illinois River and its tributaries drain much of the central part of the state. These rivers were important in the distribution of the loess and outwash soil parent materials in the state. Lake Michigan, in part gouged by glacial action, was the path of one of the major ice lobe invasions during glacial times.

Generally favorable soil parent materials and a lack of extreme weathering and soil development since glacial times have given Illinois productive soils. Good soils, a favorable climate for crop production, a high percentage of nearly level to gently sloping land, and favorable markets have all contributed to Illinois's high ranking as an agricultural state.

Soil Parent Materials

The parent materials of mineral soils are formed by the disintegration and decomposition of rock. These materials may be moved from place to place by water, wind, or glaciers, and may have been sorted or mixed to varying degrees. Organic soils (peats and mucks) are formed from the remains of plants.

Fifteen different areas of soil parent materials (designated by Roman numerals) are shown on the Illinois map in Figure 2. The sixteenth area, organic materials (peats and mucks) is not indicated because of its small extent. Figure 2 shows soil parent material regions in

Table 50. Characteristics and Productivity Indexes of Soil Association 57 — Haymond-Petrolia-Karnak Soils[a]

No. and name of soil series	Slope range, %	Surface soil: Avg. thickness, in.	Surface soil: Texture	Surface soil: Avg. OM in plow layer, %	Surface soil: Lime group	Subsoil: Avg. thickness, in.	Subsoil: Texture	Subsoil: Natural drainage	Subsoil: Permeability	Subsoil: Supply of P	Subsoil: Supply of K	Substratum: Texture and material	Available water to 60 inches, in.	Erodibility factor, K	Productivity index[b]: High mgmt.	Productivity index[b]: Avg. mgmt.
78 Arenzville	0-3	10	sil	2.0	C	30	sil	Mod. well-well	Moderate	M	M	sil-sicl alluvium	11.5	0.37	135	110
787 Banlic	0-2	7	sil	2.0	C	18	sil	SW. poor	Slow	L	L	sil alluvium	9.6	0.43	115	88
382 Belknap	0-5	13	sil	2.0	C	27	sil	SW. poor	Mod. slow-mod.	L	L	sil alluvium	12.6	0.37	120	95
334 Birds	0-2	8	sil	2.0	C	32	sil	Poor	Mod. slow	L	M	sil alluvium	12.8	0.43	125	100
108 Bonnie	0-2	8	sil	2.0	C	17	sil	Poor	Slow-mod.	L	L	sil alluvium	12.0	0.43	110	85
444 Bungay	0-2	10	sicl-sic	2.0	B	40	sic	Poor	Slow	L	M	sic-sicl alluvium	9.0	0.32	105	82
427 Burnside	0-4	8	sil	1.5	C	40	sil-fl. l	Well-mod. well	Moderate	L	L	ss. br.	7.4	0.37	105	80
422 Cape	0-2	10	sicl	2.0	B	32	sic	Poor	Slow-v. slow	L	M	sic-sicl alluvium	8.4	0.32	105	82
239 Dorchester	0-3	8	sil	2.5	C	32	sil	Well-mod. well	Moderate	M	M	sil alluvium	12.6	0.37	130	105
578 Dorchester, cobbly	0-3	8	sil	2.5	C	16	sil	Well	Moderate	M	M	cobbly l	8.6	0.37	120	95
180 Dupo	0-2	7	sil	1.5	C	25	sil	SW. poor	Mod. slow-slow	L	M	sic. alluvium	10.5	0.37	130	108
475 Elsah	0-5	10	sil	1.5	C	22	ch. sil	Well	Mod.-mod. rapid	L	L	v. ch. l alluvium	6.9	0.37	115	90
431 Genesee	0-2	8	sil	2.0	C	24	sil-l	Well	Moderate	L	L	sl-sil alluvium	10.8	0.37	135	108
331 *Haymond*	0-5	10	sil	2.0	C	34	sil	Mod. well-well	Moderate	L	M	sil-l alluvium	12.8	0.37	140	112
85 Jacob	0-1	6	c	2.0	B	28	c-sic	Poor-v. poor	V. slow	L	L	c-sic alluvium	6.6	0.28	70	52
28 Jules	0-2	7	sil	1.5	C	14	sil	Well-mod. well	Moderate	L	M	sil alluvium	12.1	0.37	125	98
782 Juneau	0-6	6	sil	1.5	C	32	sil	Well-mod. well	Moderate	L	M	sil-sicl wash	11.3	0.37	130	105
426 *Karnak*	0-1	6	sic	2.5	B	40	sic	Poor	Slow-v. slow	L	M	sic-c alluvium	7.2	0.32	100	78
415 Orion	0-2	6	sil	2.0	C	16	sil	SW. poor	Moderate	M	M	sil-sicl alluvium	10.6	0.37	130	105
288 *Petrolia*	0-2	8	sicl	2.5	B	30	sicl	Poor	Mod. slow	L	M	sil-sicl alluvium	11.0	0.32	130	102
420 Piopolis	0-2	7	sicl	2.0	B	31	sicl	Poor	Slow	L	M	sil-sicl alluvium	11.0	0.43	115	90
92 Sarpy	1-12	8	fs	1.0	D	12	fs	Well	V. rapid-rapid	L	L	lfs alluvium	5.4	0.15	75	60
72 Sharon	0-5	10	sil	1.5	C	25	sil	Mod. well-well	Moderate	L	M	sil-sl alluvium	12.3	0.37	125	98
424 Shoals	0-2	9	sil	2.0	C	19	sil	SW. poor	Mod.-mod. rapid	L	L	sil-sl alluvium	10.5	0.37	140	118
665 Stonelick	0-2	12	fsl	1.5	D	16	sl	Well	Mod. rapid	L	L	sl alluvium	6.2	0.24	90	75
333 Wakeland	0-4	8	sil	2.0	C	23	sil	SW. poor	Moderate	L	M	sil alluvium	12.4	0.37	135	108
292 Wallkill	0-2	8	sil	3.0	C	20	sil	Poor	Mod.-rapid	L	M	Muck & peat	14.4	0.32	125	100
296 Washtenaw	0-2	10	sil	2.0	C	14	sil-cl	Poor	Mod. slow-slow	L	M	sil-l wash	12.3	0.37	130	105

[a] See abbreviations at end of **Key to Illinois Soils**, page 13.
[b] The productivity indexes listed here apply to uneroded soil on a 0 to 2 percent slope. Guidelines for adjusting productivity indexes to reflect other slope and erosion conditions can be obtained from Extension circular 1156, *Soil Productivity in Illinois*, or from county Extension and Soil Conservation Service district offices.

Illinois, and is *not* a soil map. For general soils information, use the General Soil Map at the back of this publication. Some of the areas in Figure 2 are distinguished from one another by variations in the thickness of loess or other geological materials or combinations of materials. In addition, the various soil parent materials are grouped by color. For example, the first five parent material regions, which have soils formed primarily from loess, are indicated in blue. The definitions of these areas or soil parent material regions are given in the legend in Figure 2 and in the Key to Illinois Soils.

The main types of parent materials of Illinois soils are **loess, outwash, till,** and **alluvium.** Other soil parent materials, such as bedrock weathered in place and plant remains, are present but are not extensive in Illinois.

Loess is the principal parent material in soil regions I through V, and is the most extensive in Illinois. Soils developed primarily from loess occupy about 63 percent of the state's land area, predominating in the western, central, and southern parts. Loess is a silty wind deposit. During glacial times, the melting of the glaciers produced tremendous floods of meltwater that were channeled down the major river valleys — the Mississippi, Illinois, Wabash, and Ohio.

During the periods of low melting, when the floodwaters receded, the wind picked up dust from the dry valley floors and deposited it as loess on the uplands. The loess is the thickest east of the valleys because of prevailing westerly winds. It is thicker near the valley source areas and gradually becomes thinner with increasing distance from the source. In uniform loess deposits, the less weathered, less developed, and more fertile soils are generally formed in the thicker loess near the source. More highly weathered, more acid, and less fertile soils are formed in the thinner loess that is farther from the source.

There are at least three main loess blankets in Illinois. The total thickness of the three loess sheets is shown in Figure 3. The Loveland, which is the oldest of the three, is present in some areas of the unglaciated part of the state. Since it is covered by the later loess sheets, however, it is of little importance as a soil parent material. The second or middle loess sheet, the Roxana, is present in significant amounts near the upper and lower Mississippi River valley, the lower Illinois River valley, and the lower Wabash and Ohio River valleys. The Roxana is not of great importance as a soil parent material because it is covered by the Peorian loess. In many areas, however, it adds to the total thickness of loess, and has had some influence on the soils that have developed in thin overlying Peorian loess. The Peorian loess, which was deposited during the Wisconsinan glacial period, when most of northeastern Illinois was last glaciated, is the main parent material of the loess soils in the state.

The Peorian loess is a good soil parent material. When deposited, it was calcareous and well supplied with plant nutrients (except nitrogen). It was a friable, medium-textured silt loam with a high available-water holding capacity. In some areas of soil associations in which the soils developed primarily from loess, the loess has been worn away by erosion, particularly on steep slopes. In these areas, the soils formed from glacial till, thin loess on glacial till, or from bedrock or bedrock residuum. In some places, bedrock outcrops on very steep slopes. Many of the state's other soil associations, in which the soils developed primarily from glacial drift or outwash, have thin loess covers that have influenced at least the upper part of the profile of many soils outside the predominately loess areas in Illinois. Soil parent material V, moderately thick to thin loess or silty material on medium-textured Wisconsinan outwash, could be grouped with soils formed from outwash materials; however, to emphasize the silty nature of region V soils, these soils were grouped with loess soils.

Outwash materials are important in soil regions IX, X, XI, XII, and part of region V, which occupy about 8 percent of the state's land area. These materials are most extensive in northern Illinois but also occur along the Mississippi, Illinois, Wabash, and Ohio River valleys as stream terraces (Figure 2). The parent materials in these valleys and outwash areas that had an important influence on present-day soils were deposited by Wisconsinan glacial meltwaters. These materials vary in texture from gravel to clay. The coarse, gravelly materials were deposited near the glacier front or in the upper reaches of the river valleys. Sand was usually carried somewhat farther than gravel, depending upon the velocity of the running water. Gravelly outwash (area X) and very sandy outwash (area XII) are indicated in red in Figure 2. The finer materials, such as silt and clay, were deposited in quiet water. These silty and loamy outwash areas (IX and XI) are indicated in orange. In bodies of quiet water such as glacial lakes, the sediments are high in clay and silt and are known as lacustrine or lake-bed sediments. Soil region IX is composed mainly of soils formed in lacustrine sediments.

In many places the outwash is stratified; that is, it consists of layers of various textured material. The medium-textured outwash is the most desirable outwash parent material. Soils developed from medium-textured outwash compare favorably in crop production with the better loess and till soils.

Glacial till is an important soil parent material in northeastern Illinois. Soils developed primarily from till make up soils regions VI, VII, and VIII. They occupy about 12 percent of the state's land area, and are indicated in green in Figure 2. In northeastern Illinois, the glacial tills are of Wisconsinan age. Older till of Illinoian

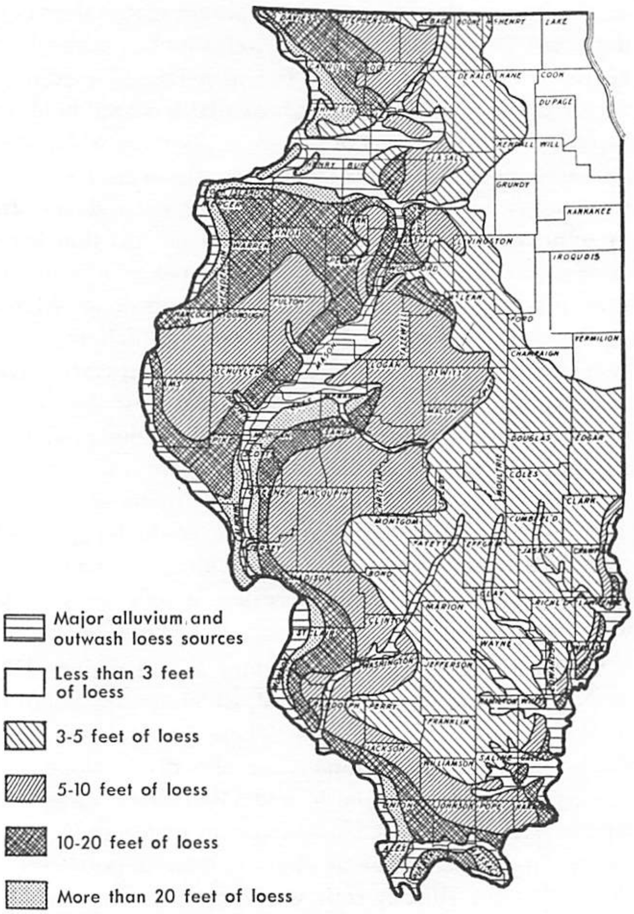


Figure 3. Approximate loess depths (feet) on uneroded topography in Illinois.

age, in which a few soils have formed on the steeper slopes, are present throughout much of the rest of Illinois. In western Illinois, soils that formed from Kansan till, which is older than the Illinoian, are found on some steep slopes, especially in western and southern Adams County and in northwestern Pike County. The Wisconsinan tills in northeastern Illinois are extremely variable in texture, ranging from loamy gravel to clay and including sandy loam, loam and silt loam, silty clay loam, and silty clay. In general, till contains more sand than loess, and commonly includes pebbles and various sizes of boulders. Most of the Wisconsinan tills in Illinois were deposited by a glacial lobe that was channeled southward through Lake Michigan. The Lake Michigan ice lobe crossed mixed areas of limestone, shale, and sandstone and some igneous rocks. It left a blanket of tills that often vary from moraine to moraine. Where the moraines are closely spaced, the soils developed from these tills often vary widely in permeability over short distances. The medium-textured tills, especially loams and silt loams, are good soil parent materials. The coarser or finer the texture, the less desirable the till as a parent material. When they were deposited, the tills were calcareous and well supplied with plant nutrients except nitrogen and possibly phosphorus. In general, the tills have considerably lower available-water holding capacities and higher bulk densities and are more compact than loess.

Alluvium includes the sediments recently deposited by streams on their floodplains. It is the main soil parent material in soil region XV, which occupies about 12 percent of the state, and is indicated in brown in Figure 2. Alluvium occurs throughout Illinois in stream valleys. It is most extensive in southern Illinois because that region is more dissected and has older, more mature, and wider valleys. Many of the small valleys or alluvial areas in the state are too small to be shown on the General Soil Map.

Alluvial sediments in Illinois vary in reaction from acid to calcareous, in color from light to dark, and in texture from sands to clays. The acid alluvial sediments occur in southern Illinois, and the slightly acid to neutral and the calcareous sediments occur primarily in the central and northern parts of Illinois, although they are found throughout the state. Medium-textured alluvial sediments predominate. The smaller stream valleys usually have silty or loamy sediments, and the moderately fine- and fine-textured sediments are found mainly in the larger bottomlands along the Mississippi, Illinois, Wabash, and Ohio rivers.

Soils formed from bedrock weathered in place are of minor extent in Illinois. These soils are most important on steep slopes in the unglaciated sections of northwestern Illinois and in extreme southern Illinois. Often the residual soils have been eroded in the geologic past and now have upper horizons that formed in later deposited materials. Soils formed from thin loess, till, or outwash on various kinds of bedrock are most extensive in soil parent material regions XIII and XIV, which occupy about 5 percent of the state. These two regions are indicated in yellow in Figure 2. Many of the ridgetops and more level areas of regions XIII and XIV have moderately thick to thick loess soil parent materials, but are too narrow to show in Figure 2.

Organic materials or the remains of plants are also of minor importance as soil parent materials in Illinois. They occur mainly in extreme northeastern Illinois in soil region XVI, which occupies only about 0.2 percent of the state; a few areas are found in some of the major river valleys. Soil region XVI is not shown in Figure 2 because the individual areas of this region are too small. However, these areas are shown on the General Soil Map at the back of this publication. Mucks and peats are the main soils formed from the decay of plant remains. Both are very high in organic matter. Muck is more decomposed than peat.

Climate

Climate plays an important role in soil development, and is responsible for many of the differences between soils. It largely determines the type of weathering that takes place in an area and also influences the type of vegetation that grows on soils. The humid, temperate climate of Illinois is conducive to the breakdown of soil minerals, the formation of clay, and the translocation or movement of these materials downward in the soil profile. Materials such as clay tend to be removed from A horizons and accumulate in B horizons. This is the reason why B horizons or subsoils are usually heavier textured than A horizons in soils that developed in uniform parent materials.

Temperature and rainfall are the major components of climate, and their effects are often closely related. In general, both clay formation and clay destruction increase as temperature and rainfall increase. Current evidence indicates that a zone of maximum clay accumulation exists in the soils of central Illinois. In northern Illinois, the rate of clay formation is lower than in the central part of the state. In southern Illinois, the rate of clay destruction and movement downward from the B horizon appear to be greater than the current rate of clay accumulation. These relationships are likely to change with geologic time and advanced weathering of soils. In general, chemical weathering is more intense in humid, warm climates and physical weathering is more important in dry climates.

The climate of Illinois during the development of our soils is difficult to characterize. The best evidence seems to indicate that there were significant fluctuations in temperature and rainfall. For some time during and after the retreat of the last Wisconsinan glacial ice from Illinois, some 12,000 years ago, the climate in Illinois was cooler and wetter than at present. A rather warm, dry period 4,000 to 6,000 years ago led to an expansion of grassland in the state. Since that time, our climate seems to have remained similar to that of today.

The present climate in the state is of the continental type, with hot summers and cold winters. The average annual temperature ranges from about 47° F. in the north to 59° F. in the south (Figure 4). January is normally the coldest month; the mean temperature ranges from about 22° F. in the north to 36° F. in the south. The mean temperature in July (usually the hottest month) ranges from about 73° F. in the north to 80° F. in the south. The latitudinal extent of the state from 37 to 42.5 degrees north is largely responsible for these temperature variations.

The average annual precipitation in Illinois ranges from about 32 inches in the north to 47 inches in the south (Figure 5). Although total precipitation is greatest in southern Illinois, about the same amount falls during the growing season (April to September) throughout the state. Because southern Illinois is closer to the Gulf of Mexico and has more cyclonic activity in winter, it has more winter and early spring precipitation than the remainder of the state.

The average number of frost-free days in Illinois ranges from less than 160 in the north to more than 200 in the south (Figure 6). Although the growing season is shorter in northern Illinois, frost damage is usually not a serious problem because crop varieties and corn hybrids with shorter maturity periods are used in that part of the state.

In the southern one-third of the state, where the average growing season is more than about 180 days, double cropping of soybeans following wheat has been widely practiced in recent years. If there is enough moisture to germinate soybeans planted directly in wheat stubble during June and July, the growing season is usually long enough to mature the second-crop soybeans. Yields of the second-crop soybeans are rather variable, but add to net farm income in most years.

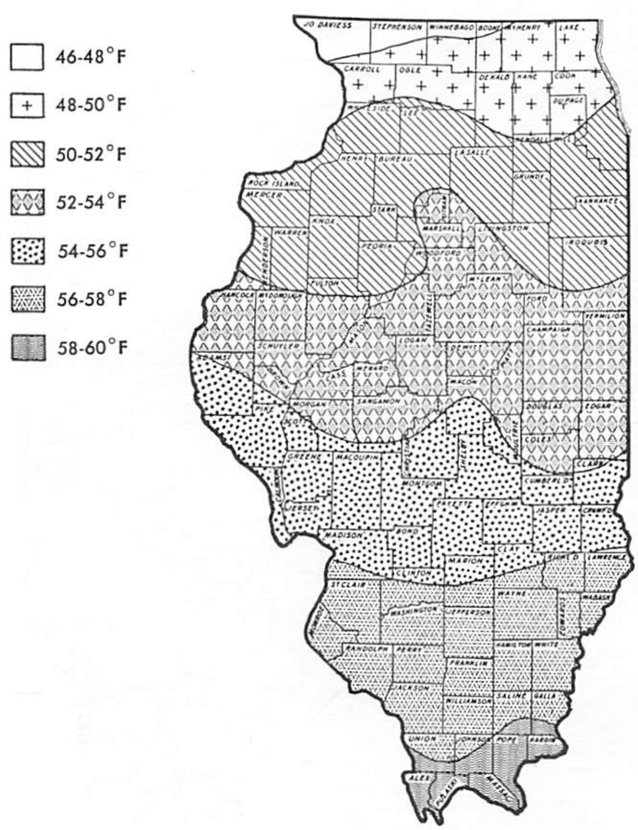


Figure 4. Average annual temperature (degrees Fahrenheit) in Illinois, 1931 to 1960. (Data from U.S. Weather Bureau.)

Vegetation

Soil development is influenced by the native vegetation under which the soils formed. The two main types of native vegetation that influenced Illinois soils are grass or prairie and trees or forest. Although the climate of Illinois is conducive to the growth of forest, about 55 percent of the state had prairie vegetation during and for some time before settlement (Figure 7). The prairie vegetation is believed to be a relict from the warm, dry period that prevailed some 4,000 to 6,000 years ago. In central and northern Illinois, where prairie vegetation predominated, forests were largely confined to the better drained, more rolling areas bordering stream valleys.

Soils formed under grass are normally dark colored and high in organic matter content unless they are highly weathered and strongly developed. Soils formed under forest in Illinois are light colored and usually low in organic matter content. Similar types of soil weathering occur under prairie and forest vegetation, but soil development is more intense under forest in climates such as that of Illinois. Although the largest area of the soils of Illinois formed under grass, it is evident that at the time of settlement the forests were encroaching upon the prairies. Along the prairie-forest border, it is common to find moderately dark-colored soils under forest. In these areas, the forest has not been present for sufficient time to entirely change soil features imparted by a previous grass or prairie vegetation.

Vegetation is not the only living matter that influences soil development. Soil development is also affected by animal life such as earthworms, crayfish, ground squirrels and other burrowing animals, and various insects. These creatures incorporate organic matter into the soil and mix soils to varying depths and degrees.

Relief and Drainage

In most parent materials under a given climate, the moisture status of soils is controlled largely by relief, which includes elevation, topography or lay and slope of the land, and water table levels. As previously mentioned, the mean elevation of Illinois is about 600 feet above sea level. The highest and most rolling areas are in northwestern and southern Illinois, and the counties with the highest percentages of nearly level land are in the central part of the state. Topography influences the amount of infiltration, runoff and drainage water, and erosion.

The amount of moisture in the soil while it is developing affects the rate of weathering and the development

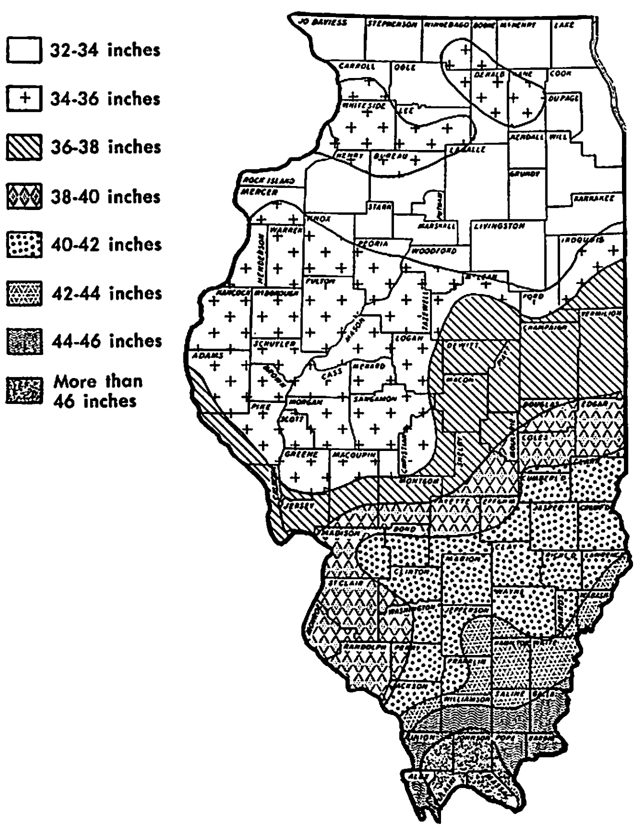


Figure 5. Average annual precipitation (inches) in Illinois, 1931 to 1960. (Data from U.S. Weather Bureau.)

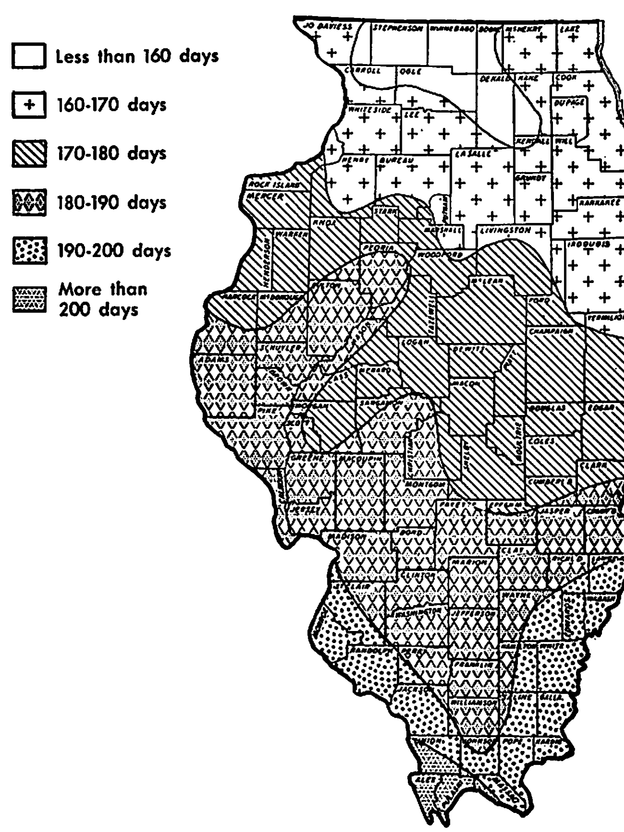


Figure 6. Average number of frost-free days in Illinois.

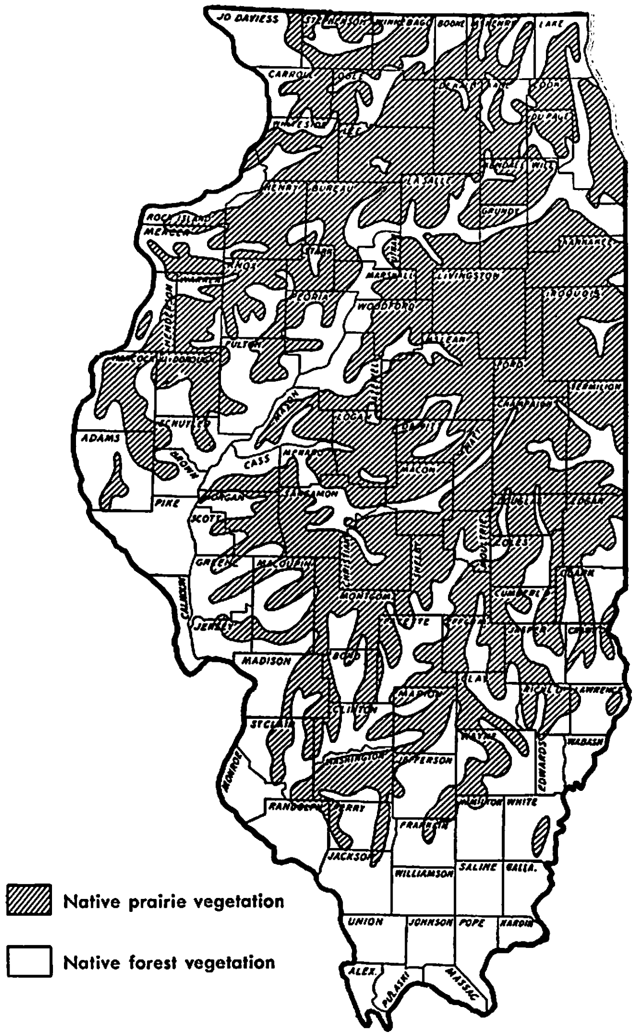


Figure 7. Native vegetation in Illinois.

of soil colors. Soil colors are a reflection of the moisture status of the soil during its development. Well-drained soils have uniformly brownish or yellowish brown subsoils; poorly drained soils have grayish subsoils; and somewhat poorly drained soils have mottled yellowish, brownish, and grayish subsoils. Water table levels are usually highest in depressional and nearly level, poorly drained areas and lowest in rough or rolling, well-drained areas.

In uniform soil materials such as loess, differences in natural soil drainage are usually closely associated with slope. The shape, direction, and length of slope also affect soil development. Convex slopes tend to be drier than concave slopes because they usually shed water faster. Slopes facing south are drier than slopes facing north because those facing south are more directly exposed to the sun. On long slopes, wash from the upper portion is often added as colluvial material to the lower portion.

Time

The effect of time on soil development cannot be measured precisely in years because the time required for a soil to develop depends upon the other factors that influence soil formation. For example, in humid climates that support good growth of vegetation, soils develop more rapidly than in dry climates. The pace of soil development is also determined by the parent material. Plant nutrients and materials such as carbonates leach more rapidly in coarse-textured, permeable parent materials than in fine-textured, slowly permeable materials; an acid soil develops much faster in materials that are low in limestone than in those that are high in limestone. Topography can also have a marked effect on the time required for a soil to develop. On steep slopes, where erosion often removes the soil nearly as fast as it is formed, soils may be very thin and youthful or weakly developed, even if they have been exposed to weathering for very long periods. On stable landscapes, however, soils tend to be more strongly developed and more highly leached, and their horizons become more differentiated the longer they are exposed to weathering.

Most of the soil parent materials of Illinois, with the exception of rock residuum, which is older, were deposited during Pleistocene or glacial times. The Peorian loess, most of the outwash, and the glacial tills of the northeastern part of the state were deposited during the Wisconsinan glacial stage, which receded from Illinois some 12,000 years ago. Most of the soils of Illinois developed during and since Wisconsinan times.

MAJOR SOIL ORDERS IN ILLINOIS

Soils may be grouped in a variety of ways, depending upon the characteristics on which the groupings are based and on the uses to be made of the groups. In soil classification, soils are grouped on the basis of properties at various levels or categories. The lowest and most detailed level is the individual kind of soil or soil series that is given a place name, such as Muscatine, Flanagan, Elliott, or Cisne. The soil order is the highest and most generalized level.

There are 10 orders or major soil groups in the soil classification system; they are believed to include all of the soils of the world. The soil orders are separated from one another on the basis of several critical horizons that give a key to the main soil-forming processes; the absence of these horizons indicates a lack of development. Soils that have undergone similar development and have similar kinds of horizons tend to be grouped in the same order. For example, most (but not all) soils with thick dark-colored A horizons are included in the Mollisol order. Soils that lack distinctive horizons, such as the light-colored, recently deposited alluvial soils, are placed in the Entisol order.

Between the soil order and soil series, there are four other categories of soils: suborders or subdivisions of the orders, great groups, subgroups, and soil families. The soil family is the category immediately above the soil series.

Only five of the 10 soil orders are important in Illinois: the Mollisols, Alfisols, Entisols, Inceptisols, and Histosols. The Mollisols and the Alfisols are by far the most extensive in the state. The distribution and extent of three of the five major soil groups or soil orders in Illinois (the Mollisols, Alfisols, and Entisols) are shown in Figure 8. Areas of the Inceptisols and Histosols are generally too small to be shown at the scale used in Figure 8.

Mollisols

The Mollisols in Illinois are the dark-colored soils formed under grass, although some of the ones on the major river floodplains had a forest or mixed forest and grass cover at the time of settlement. The thick, dark surface layer of the Mollisols was formed by the decomposition of underground vegetative remains consisting mostly of roots but also including surface vegetation that had been incorporated into the soil by animal life such as earthworms and various burrowing animals. For a soil to be classified as a Mollisol, its surface layer must not only be dark colored and have an average of more than 1 percent organic matter throughout, it must also be at least 10 inches thick (unless the total soil is very thin) and have sufficient soil structure so that it is not massive and hard or very hard when dry. In addition, the dark-colored layer and the B horizon must have a base saturation of more than 50 percent with calcium as the predominant base. The Mollisols vary widely in texture, permeability, degree of subsoil development, and many other properties.

As shown in Figure 8, Mollisols are most extensive in central and northern Illinois. In southern Illinois, they are confined largely to the floodplains and some of the terraces of the major rivers. The Mollisols shown in the river valleys in Figure 8 include some areas of Entisols and Inceptisols that were too small to be shown separately on the map. Mollisols occupy about 49 percent of the state's land area.

Alfisols

In Illinois, the Alfisols are generally the light-colored soils that formed under forest. Some major exceptions are Cowden and the related soils of soil association 5 and Cisne and the related soils of association 6. Although

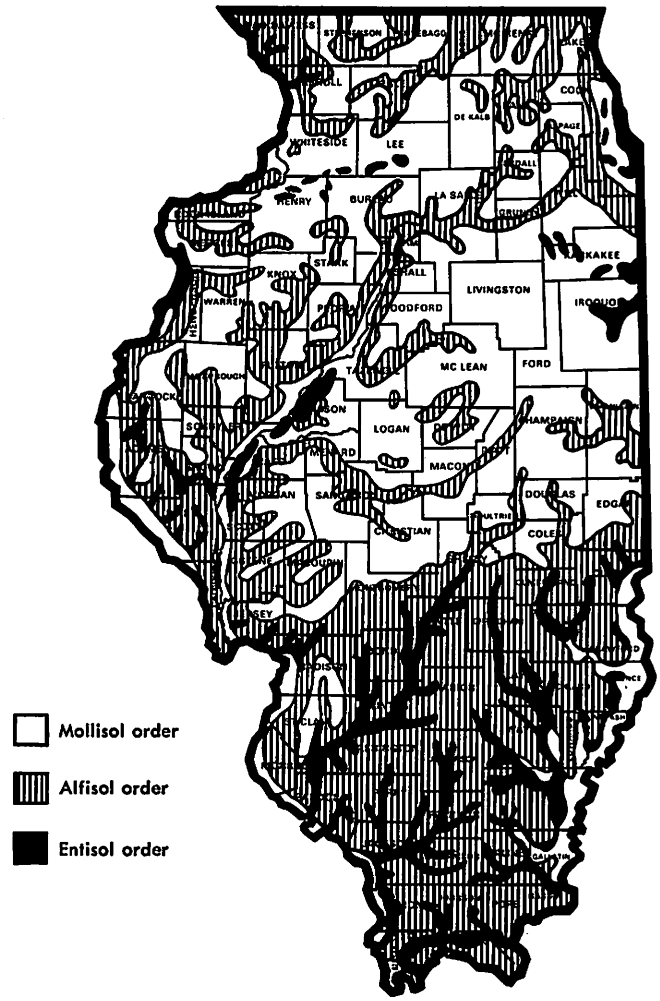


Figure 8. Major soil orders in Illinois.

both soil groups formed under grass, their surface soil layers are too thin, too light colored, or too low in base saturation to be grouped with the Mollisols. Low base saturation in the B horizon may also exclude some of these soils from the Mollisols.

The Alfisols either have light-colored surface layers or dark-colored surface layers that are only a few inches thick. For a soil to be classified as an Alfisol, its surface layer must have an average of less than 1 percent organic matter content throughout, and it must have a recognizable B horizon of clay accumulation that has a base saturation of more than 35 percent at a depth of 50 inches below the top of the B horizon.

The Alfisols predominate in southern Illinois, although they are present throughout the state (Figure 8). In central and northern Illinois, they are confined largely to the more rolling, better drained sites bordering stream valleys or to the drier morainic positions. Alfisols occupy about 46 percent of the state.

Entisols

In Illinois, the Entisols include most of the light-colored, recently deposited alluvial soils in the southern and western parts of the state. These soils have not been in place long enough to develop recognizable horizons, although they may have a darkened plow layer (Figure 7). This order also includes a few very sandy soils that lack sufficient weatherable minerals to form recognizable horizons. The light-colored sandy Entisols in Figure 12 are located mainly in central and northern Illinois and near the Mollisols in the Wabash River valley. Although some Entisols may have buried surface horizons of former soils, these soils are classified as Entisols only if recent alluvium has accumulated to a depth of more than 20 inches over the former soil.

The Entisols occur along streams that receive sediments from flooding and in very sandy areas where soils such as Plainfield predominate. A few Entisols, such as Hamburg and Bold, occur on steep slopes where geologic erosion has limited soil development. Entisols are estimated to occupy about 3¼ percent of the state.

Inceptisols

The Inceptisols include soils that have weakly developed horizons. They lack the thick, dark-colored surface layer of the Mollisols and the B horizon of clay accumulation of the Alfisols. They differ from the Entisols in having some recognizable horizons or showing evidence of the beginning of horizon development. Changes in horizon development may have taken place over relatively short periods. Processes such as leaching of carbonates, oxidation or reduction of iron compounds, and formation of structure have taken place in these soils.

The Inceptisols of Illinois include only about a dozen soil series. Some are nearly level stream terrace or bottomland soils, but most are steep soils in which geologic erosion has allowed only weak development of soil horizons. Inceptisols are estimated to occupy about 1½ percent of Illinois. The Inceptisols are included with the Entisol areas in the bottomlands and with the Alfisols in the uplands in Figure 8. Because areas of Inceptisols are often small or narrow, they could not be shown separately.

Histosols

The Histosols include the organic soils — the peats and mucks — which formed from the remains of plants. Mucks are more thoroughly decomposed than peats. These soils commonly occur in low-lying areas, remain wet unless artificially drained, and contain high amounts of organic matter. The exact amount of organic matter in the Histosols varies with the amount of clay in any mineral matter that may be mixed with the organic remains. In general, the Histosols contain much more organic matter than the Mollisols in Illinois. The organic matter content of Histosols is generally more than 20 percent.

The Histosols occur mainly in extreme northeastern Illinois, although some scattered areas are present in various counties in the northern half of the state. Areas of Histosols are too small to be shown in Figure 8. They are estimated to occupy about one-fourth of 1 percent of the state.

PROGRESS OF SOIL SURVEYS IN ILLINOIS

For most users, the two essential elements of a soil survey are (1) the soil map, which shows the location and extent of the various soil types on a suitable base map of the area; and (2) the soil report, which describes and gives the properties of the soils and their characteristics for various purposes and uses such as agriculture, engineering, and woodland.

Soil surveys have been made in Illinois since 1902. Over the years, soil survey techniques and skills have been developed and improved, resulting in more accurate, larger, and more detailed soil maps and more comprehensive soil reports.

The current status of soil survey maps and reports for Illinois is shown in Figure 9. Forty-five counties have modern published soil surveys. The soil maps in these surveys have an aerial photo base and indicate the soil type, slope, and degree of erosion. The scale of most of these surveys is 4 inches to 1 mile. Surveys for 12 more counties are essentially complete and scheduled to be published soon. Modern surveys are in progress in 20 other counties, but none is currently being conducted in the remaining 25 counties. Some of these 25 counties have older surveys with soil maps that are small and considerably out of date. General information on soils in these counties is available through the Soil Conservation Service, USDA, or the Department of Agronomy, University of Illinois at Urbana-Champaign.

Counties with Modern Published Soil Surveys

Published soil reports are listed below with their numbers in the Illinois Agricultural Experiment Station series as well as the county name and year of publication. Published reports can be obtained from the Office of Agricultural Publications, 47 Mumford Hall, 1301 W. Gregory Drive, or the Department of Agronomy, W-201 Turner Hall, 1102 S. Goodwin Avenue, both at the University of Illinois, Urbana, Illinois 61801, or from the local district office of the Soil Conservation Service, USDA, or local county Extension office.

101	Adams (1979)
85	Alexander-Pulaski (1968)
107	Boone-Winnebago (1980)
98	Carroll (1975)
114	Champaign (1982)
103	Clark (1979)
108	Cook-DuPage (1979)
96	DeKalb (1978)
89	Douglas (1971)
108	DuPage-Cook (1979)
90	Edwards-Richland (1972)
87	Gallatin (1969)
93	Greene (1974)
112	Grundy (1980)
94	Hardin-Pope-Massac (1975)
77	Henderson (1956)
115	Iroquois (1982)
106	Jackson (1979)
84	Jersey (1966)
82	Johnson (1964)
109	Kane (1979)
105	Kankakee (1979)
95	Kendall (1978)
88	Lake (1970)
91	LaSalle (1972)
78	Lawrence (1956)
92	Logan (1974)
94	Massac-Pope-Hardin (1975)
81	McHenry (1965)
76	Menard (1953)
86	Montgomery (1969)
113	Ogle (1980)
94	Pope-Hardin-Massac (1975)
85	Pulaski-Alexander (1968)
90	Richland-Edwards (1972)
97	Rock Island (1977)
102	Saline (1978)
111	Sangamon (1980)
104	St. Clair (1978)
99	Stephenson (1976)
110	Union (1979)
83	Wabash (1964)
80	Will (1962)
79	Williamson (1959)
107	Winnebago-Boone (1980)

Counties with Completed Surveys to be Published Soon

Bond	Henry	Madison	Perry
Brown	Knox	Monroe	Randolph
Hamilton	Lee	Morgan	Scott

Counties with Soil Surveys in Progress

Bureau	Ford	Piatt
Calhoun	Jasper	Shelby
Cass	Macon	Tazewell
Christian	Macoupin	Vermilion
Coles	Marion	Wayne
DeWitt	Mercer	Whiteside
Effingham	Peoria	

Counties in Need of Modern Soil Surveys

Some counties have older surveys. Most of these surveys are considerably out of date; those indicated with an asterisk (*) are no longer available.

1	Clay (1911)
57	Clinton (1936)
	Crawford
69	Cumberland (1940)
15	Edgar (1917)
52	Fayette (1932)
	Franklin
51	Fulton (1932)
27	Hancock (1924)
	Jefferson
	Jo Daviess
*72	Livingston (1949)
59	Marshall (1937)
28	Mason (1924)
7	McDonough (1913)
10	McLean (1915)
2	Moultrie (1911)
11	Pike (1915)
60	Putnam (1937)
56	Schuyler (1934)
64	Stark (1939)
*70	Warren (1941)
58	Washington (1937)
	White
36	Woodford (1927)

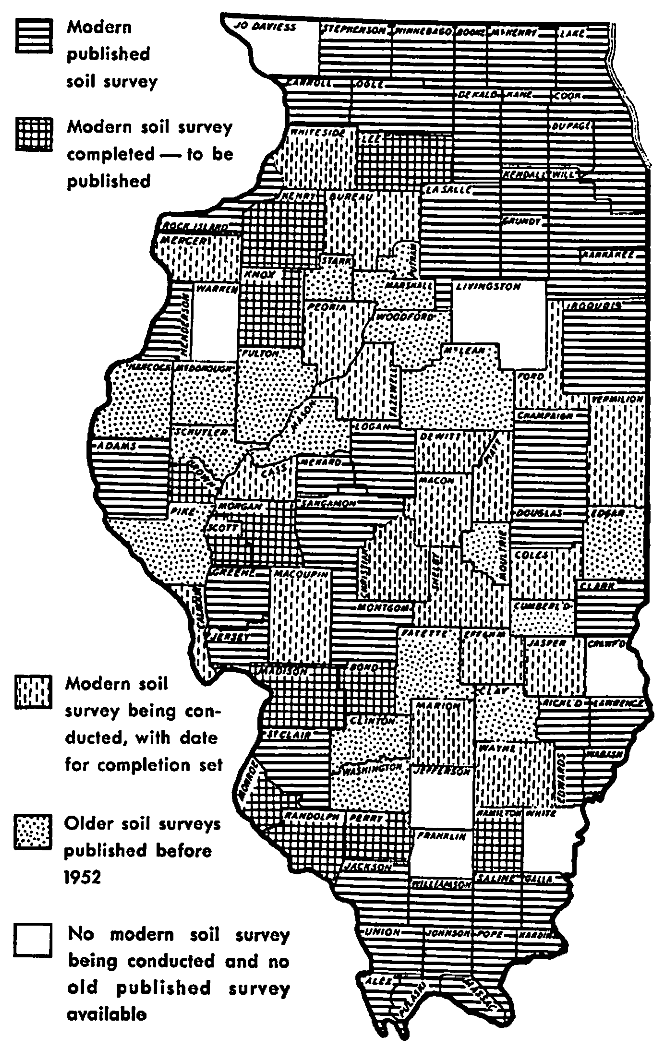


Figure 9. Status of soil survey maps in Illinois.

Alphabetical List of Illinois Soils (Number, Series, Family, Line in Soil Key, and Soil Association Area)

No.	Series	Family	Line in Soil Key	Soil association area
98	Ade	Coarse-loamy, mixed, mesic Psammentic Argiudolls	185	22
777	Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists	305	25
670	Aholt	Very-fine, montmorillonitic (calcareous), mesic Vertic Haplaquolls	144	19
308	Alford	Fine-silty, mixed, mesic Typic Hapludalfs	17, 228, 243	33, 52, 53
306	Allison	Fine-silty, mixed, mesic Cumulic Hapludolls	285	24
131	Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs	193	50
131V	Alvin, thick A	Coarse-loamy, mixed, mesic Typic Hapludalfs	194	50
302	Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls	267	24
293	Andres	Fine-loamy, mixed, mesic Aquic Argiudolls	116	15
365	Aptakisic	Fine-silty, mixed, mesic Aeric Ochraqualfs	87	41
78	Arenzville	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents	274	57
227	Argyle	Fine-loamy, mixed, mesic Mollic Hapludalfs	55	37
597	Armiesburg	Fine-silty, mixed, mesic Fluventic Hapludolls	284	24
411	Ashdale	Fine-silty, mixed, mesic Typic Argiudolls	212	23
232	Ashkum	Fine, mixed, mesic Typic Haplaquolls	112	14
259	Assumption	Fine-silty, mixed, mesic Typic Argiudolls	45	2, 3, 4
661	Atkinson	Fine-loamy, mixed, mesic Typic Argiudolls	220	23
7	Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs	41	32, 33, 34, 35, 36
61	Atterberry	Fine-silty, mixed, mesic Udollic Ochraqualfs	12	32
14	Ava	Fine-silty, mixed, mesic Typic Fragiudalfs	33	36
204	Ayr	Fine-loamy, mixed, mesic Typic Argiudolls	106	12, 13
768	Backbone	Coarse-loamy, mixed, mesic Mollic Hapludalfs	216	51
787	Banlic	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts	273	57
443	Barrington	Fine-silty, mixed, mesic Typic Argiudolls	85	11
105	Batavia	Fine-silty, mixed, mesic Mollic Hapludalfs	73	41
599	Baxter	Fine, mixed, mesic Typic Paleudalfs	224	52
472	Baylis	Fine-silty, mixed, mesic Typic Paleudalfs	226	52
188	Beardstown	Fine-loamy, mixed, mesic Udollic Ochraqualfs	176	21
691	Beasley	Fine, mixed, mesic Typic Hapludalfs	255	54, 55
70	Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls	284	24
598	Bedford	Fine-silty, mixed, mesic Typic Fragiudults	227	52
298	Beecher	Fine, illitic, mesic Udollic Ochraqualfs	113	44
382	Belknap	Coarse-silty, mixed, acid, mesic Aeric Fluvaquents	272	57
955, 986	Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts	230	53, 54, 55
332	Billett	Coarse-loamy, mixed, mesic Mollic Hapludalfs	189	50
334	Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents	271	57
233	Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs	69	39
603	Blackoar	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls	281	24
5	Blair	Fine-loamy, mixed, mesic Aquic Hapludalfs	39	31, 32, 33, 34, 35, 36
53	Bloomfield	Coarse-loamy, mixed, mesic Psammentic Hapludalfs	186	50
23	Blount	Fine, illitic, mesic Aeric Ochraqualfs	114	44
13	Bluford	Fine, montmorillonitic, mesic Aeric Ochraqualfs	33	36
471	Bodine	Loamy-skeletal, siliceous, thermic Typic Paleudults	223	52
35	Bold	Coarse-silty, mixed (calcareous), mesic Typic Udorthents	16	31, 32, 33
493	Bonfield	Loamy-skeletal, mixed, mesic Aquic Hapludolls	215	23
108	Bonnie	Fine-silty, mixed, acid, mesic Typic Fluvaquents	272	57
457	Booker	Very-fine, montmorillonitic, mesic Vertic Haplaquolls	145, 301	19, 24
397	Boone	Mesic, uncoated Typic Quartzipsamments	229	56
589	Bowdre	Clayey over loamy, montmorillonitic, thermic Fluvaquentic Hapludolls	292	24
792	Bowes	Fine-silty, mixed, mesic Mollic Hapludalfs	89	41
706	Boyer	Coarse-loamy, mixed, mesic Typic Hapludalfs	165	48
956	Brandon	Fine-silty, mixed, thermic Typic Hapludults	246	54
149	Brenton	Fine-silty, mixed, mesic Aquic Argiudolls	82	11
684	Broadwell	Fine-silty, mixed, mesic Typic Argiudolls	61	8
136	Brooklyn	Fine, montmorillonitic, mesic Mollic Albaqualfs	80	11
235	Bryce	Fine, mixed, mesic Typic Haplaquolls	118	16

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
444	Bungay	Fine, mixed, nonacid, mesic Typic Haplaquepts	294	46, 57
961	Burkhardt	Sandy, mixed, mesic Typic Hapludolls	149	20
427	Burnside	Loamy-skeletal, mixed, acid, mesic Typic Udifluvents	258	57
590	Cairo	Clayey over sandy or sandy-skeletal, montmorillonitic, thermic Vertic Haplaquolls	290	24
746	Calamine	Fine, mixed, mesic Typic Argiaquolls	250, 252	56
400	Calco	Fine-silty, mixed (calcareous), mesic Cumulic Haplaquolls	288	24
134	Camden	Fine-silty, mixed, mesic Typic Hapludalfs	84	41
347	Canisteo	Fine-loamy, mixed (calcareous), mesic Typic Haplaquolls	76	11
422	Cape	Fine, montmorillonitic, acid, mesic Typic Fluvaquents	293	57
286	Carmi	Coarse-loamy, mixed, mesic Typic Hapludolls	153	20
323	Casco	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	155	48
171	Catlin	Fine-silty, mixed, mesic Typic Argiudolls	67	9
315	Channahon	Loamy, mixed, mesic Lithic Argiudolls	199	23
241	Chatsworth	Fine, illitic, mesic Typic Eutrochrepts	123	44, 45
287	Chauncey	Fine, montmorillonitic, mesic Typic Argialbolls	30	6
779	Chelsea	Mixed, mesic Alfic Udipsamments	184	50
282	Chute	Mixed, mesic Typic Udipsamments	179	50
2	Cisne	Fine, montmorillonitic, mesic Mollic Albaqualfs	29	6
147	Clarence	Fine, illitic, mesic Aquic Argiudolls	124	17
257	Clarksdale	Fine, montmorillonitic, mesic Udollic Ochraqualfs	21, 25	34
471	Clarksville	Loamy-skeletal, siliceous, mesic Typic Paleudults	222	52
18	Clinton	Fine, montmorillonitic, mesic Typic Hapludalfs	22, 26	34
660	Coatsburg	Fine, montmorillonitic, mesic, sloping Typic Argiaquolls	40	4, 5, 6
428	Coffeen	Coarse-silty, mixed, mesic Fluvaquentic Hapludolls	92	11
402	Colo	Fine-silty, mixed, mesic Cumulic Haplaquolls	286	24
122	Colp	Fine, montmorillonitic, mesic Aquic Hapludalfs	143	46
776	Comfrey	Fine-loamy, mixed, mesic Cumulic Haplaquolls	266	24
495	Corwin	Fine-loamy, mixed, mesic Typic Argiudolls	100	12
112	Cowden	Fine, montmorillonitic, mesic Mollic Albaqualfs	27	5
764	Coyne	Coarse-loamy, mixed, mesic Typic Argiudolls	129	11, 19
609	Crane	Fine-loamy, mixed, mesic Aquic Argiudolls	166	20
337	Creal	Fine-silty, mixed, mesic Aquic Hapludalfs	34	36
379	Dakota	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls	159	20
56	Dana	Fine-silty, mixed, mesic Typic Argiudolls	97	12
620	Darmstadt	Fine-silty, mixed, mesic Albic Natraqualfs	36	4, 5, 6
740	Darroch	Fine-loamy, mixed, mesic Aquic Argiudolls	172	21
71	Darwin	Fine, montmorillonitic, mesic Vertic Haplaquolls	298	24
192	Del Rey	Fine, illitic, mesic Aeric Ochraqualfs	135	46
45	Denny	Fine, montmorillonitic, mesic Mollic Albaqualfs	11	2, 3
262	Denrock	Fine, mixed, mesic Aquic Argiudolls	138	19
417	Derinda	Fine, mixed, mesic Typic Hapludalfs	251	56
87	Dickinson	Coarse-loamy, mixed, mesic Typic Hapludolls	187	22
742	Dickinson, loamy sub.	Coarse-loamy, mixed, mesic Typic Hapludolls	188	22
266	Disco	Coarse-loamy, mixed, mesic Cumulic Hapludolls	196	22
24	Dodge	Fine-silty, mixed, mesic Typic Hapludalfs	96	42
40	Dodgeville	Fine-silty over clayey, mixed, mesic Typic Argiudolls	208	23
239	Dorchester	Fine-silty, mixed (calcareous), mesic Typic Udifluvents	279	57
578	Dorchester, cobbly	Fine-silty, mixed (calcareous), mesic Typic Udifluvents	280	57
128	Douglas	Fine-silty, mixed, mesic Typic Argiudolls	50	4, 5
346	Dowagiac	Fine-loamy, mixed, mesic Mollic Hapludalfs	160	48
386	Downs	Fine-silty, mixed, mesic Mollic Hapludalfs	12, 21, 25	32, 34
325	Dresden	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Mollic Hapludalfs	157	48
152	Drummer	Fine-silty, mixed, mesic Typic Haplaquolls	67, 72, 82, 94, 97	9, 11, 12

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
75	Drury	Fine-silty, mixed, mesic Dystric Eutrochrepts	93	41
29	Dubuque	Fine-silty, mixed, mesic Typic Hapludalfs	211	51
505	Dunbarton	Clayey, montmorillonitic, mesic Lithic Hapludalfs	203	51
511	Dunbarton, cher.	Clayey, montmorillonitic, mesic Lithic Hapludalfs	204	51
321	Du Page	Fine-loamy, mixed, mesic Cumulic Hapludolls	265	24
180	Dupo	Coarse-silty over clayey, mixed, nonacid, mesic Aquic Udifluvents	276	57
416	Durand	Fine-loamy, mixed, mesic Typic Argiudolls	54	7
48	Ebbert	Fine-silty, mixed, mesic Argiaquic Argialbolls	31	6
272	Edgington	Fine-silty, mixed, mesic Argiaquic Argialbolls	9	1, 2
249	Edinburg	Fine, montmorillonitic, mesic Typic Argiaquolls	19	3
769	Edmund	Clayey, montmorillonitic, mesic Lithic Argiudolls	202	23
312	Edwards	Marly, euic, mesic Limnic Medisaprist	307	25
198	Elburn	Fine-silty, mixed, mesic Aquic Argiudolls	72	11
119	Elco	Fine-silty, mixed, mesic Typic Hapludalfs	46	32, 33, 34
264	El Dara	Fine-loamy, mixed, mesic Typic Hapludalfs	197	34
547	Eleroy	Fine-silty, mixed, mesic Typic Hapludalfs	254	56
761	Eleva	Coarse-loamy, mixed, mesic Typic Hapludalfs	232	56
567	Elkhart	Fine-silty, mixed, mesic Typic Argiudolls	20	3
146	Elliott	Fine, illitic, mesic Aquic Argiudolls	112	14
137	Ellison	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	161	48
475	Elsah	Loamy-skeletal, mixed, nonacid, mesic Typic Udifluvents	259	57
469	Emma	Fine-silty, mixed, mesic Typic Dystrochrepts	178	49
516	Faxon	Fine-loamy, mixed, mesic Typic Haplaquolls	219	23
280	Fayette	Fine-silty, mixed, mesic Typic Hapludalfs	13	32
380	Fieldon	Coarse-loamy, mixed (calcareous), mesic Typic Haplaquolls	164	20
496	Fincastle	Fine-silty, mixed, mesic Aeric Ochraqualfs	99	42
6	Fishhook	Fine, montmorillonitic, mesic Aquic Hapludalfs	44	32, 34
419	Flagg	Fine-silty, mixed, mesic Typic Hapludalfs	60	37
783	Flagler	Coarse-loamy, mixed, mesic Typic Hapludolls	152	20
154	Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls	67	9
327	Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	158	48
320	Frankfort	Fine, illitic, mesic Udollic Ochraqualfs	119, 125	45
781	Friesland	Fine-loamy, mixed, mesic Typic Argiudolls	170	21
786	Frondorf	Fine-loamy, mixed, mesic Ultic Hapludalfs	237	35, 36
591	Fults	Fine, montmorillonitic, mesic Vertic Haplaquolls	289	24
413	Gale	Fine-silty over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	238	56
431	Genesee	Fine-loamy, mixed, nonacid, mesic Typic Udifluvents	264	57
201	Gilford	Coarse-loamy, mixed, mesic Typic Haplaquolls	187	22
460	Ginat	Fine-silty, mixed, mesic Typic Fragiaqualfs	177	49
162	Gorham	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls	287	24
551	Gosport	Fine, illitic, mesic Typic Dystrochrepts	249	56
606	Goss	Clayey-skeletal, mixed, mesic Typic Paleudalfs	225	52
513	Granby	Sandy, mixed, mesic Typic Haplaquolls	180	22
301	Grantsburg	Fine-silty, mixed, mesic Typic Fragiudalfs	248	55
698	Grays	Fine-silty, mixed, mesic Mollic Hapludalfs	86	41
780	Grellton	Fine-loamy, mixed, mesic Typic Hapludalfs	171	49
363	Griswold	Fine-loamy, mixed, mesic Typic Argiudolls	108	13
30	Hamburg	Coarse-silty, mixed (calcareous), mesic Typic Udorthents	15	31, 32, 33
484	Harco	Fine-silty, mixed, mesic Aquic Argiudolls	131	18
67	Harpster	Fine-silty, mixed, mesic Typic Calciaquolls	10, 75	2, 3, 9, 11
127	Harrison	Fine-silty, mixed, mesic (Aquic) Typic Argiudolls	50	4, 5
244	Hartsburg	Fine-silty, mixed, mesic Typic Haplaquolls	20	3
344	Harvard	Fine-silty, mixed, mesic Mollic Hapludalfs	83	41
252	Harvel	Fine-silty, mixed, mesic Typic Haplaquolls	24	4

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
771	Hayfield	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aquollic Hapludalfs	163	48
331	Haymond	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents	271	57
25	Hennepin	Fine-loamy, mixed, mesic Typic Eutrochrepts	105	39, 42, 43
62	Herbert	Fine-silty, mixed, mesic Udollic Ochraqualfs	95	42
46	Herrick	Fine, montmorillonitic, mesic Aquic Argiudolls	23	4
390	Hesch	Coarse-loamy, mixed, mesic Typic Argiudolls	233	56
537	Hesch gray subs.	Coarse-loamy, mixed, mesic Typic Haplaquolls	233	56
389	Hesch, thin to ss.	Sandy, mixed, mesic Lithic Hapludolls	234	56
8	Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs	39	31, 32, 33, 34, 35, 36
556	High Gap	Fine-loamy, mixed, mesic Typic Hapludalfs	236	56
506	Hitt	Fine-loamy, mixed, mesic Typic Argiudolls	205	23
326	Homer	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aeric Ochraqualfs	158	48
354	Hononegah	Sandy, mixed, mesic Entic Hapludolls	150	20
172	Hoopeston	Coarse-loamy, mixed, mesic Aquic Hapludolls	187	22
214	Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs	28, 244	35, 54
103	Houghton muck	Euic, mesic Typic Medisaprists	303	25
97	Houghton peat	Euic, mesic Hemic Medisaprists	302	25
3	Hoyleton	Fine, montmorillonitic, mesic Aquollic Hapludalfs	29	6
120	Huey	Fine-silty, mixed, mesic Typic Natraqualfs	36	4, 5, 6
600	Huntington	Fine-silty, mixed, mesic Fluventic Hapludolls	281	24
77	Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls	282	24
338	Hurst	Fine, montmorillonitic, mesic Aeric Ochraqualfs	143	46
307	Iona	Fine-silty, mixed, mesic Typic Hapludalfs	14	31, 32, 33
43	Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls	18	3
454	Iva	Fine-silty, mixed, mesic (Typic) Aeric Ochraqualfs	17, 228, 243	33, 52, 53
85	Jacob	Very-fine, montmorillonitic, acid, mesic Vertic Haplaquepts	300	57
440	Jasper	Fine-loamy, mixed, mesic Typic Argiudolls	172	21
314	Joliet	Loamy, mixed, mesic Lithic Haplaquolls	199	23
763	Joslin	Fine-loamy, mixed, mesic Typic Argiudolls	130	11, 19
275	Joy	Fine-silty, mixed, mesic Aquic Hapludolls	1	1
28	Jules	Coarse-silty, mixed (calcareous), mesic Typic Udifluvents	270	57
782	Juneau	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents	275	57
343	Kane	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Argiudolls	156	20
494	Kankakee	Loamy-skeletal, mixed, mesic Typic Hapludolls	215	23
426	Karnak	Fine, montmorillonitic, nonacid, mesic Vertic Haplaquepts	295	57
421	Kell	Fine-silty, mixed, mesic Typic Hapludalfs	239	36
470	Keller	Fine, montmorillonitic, mesic Aquic Argiudolls	43	2, 3, 4
546	Keltner	Fine-silty, mixed, mesic Typic Argiudolls	252	56
242	Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs	74	41
17	Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs	22, 26	34
554	Kernan	Fine, montmorillonitic, mesic Aeric Ochraqualfs	71	45
361	Kidder	Fine-loamy, mixed, mesic Typic Hapludalfs	109	43
191	Knight	Fine-silty, mixed, mesic Argiaquic Argialbolls	81	11
102	La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls	175	21
175	Lamont	Coarse-loamy, mixed, mesic Typic Hapludalfs	190	50
304	Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls	261	24
60	La Rose	Fine-loamy, mixed, mesic Typic Argiudolls	103	12, 13
647	Lawler	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Hapludolls	162	20
683	Lawndale	Fine-silty, mixed, mesic Aquic Argiudolls	61	8
451	Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls	282	24
628	Lax	Fine-silty, siliceous, thermic Typic Fragiudults	245	54
196	Lemond	Coarse-loamy, mixed (calcareous), mesic Typic Haplaquolls	77	11
210	Lena	Euic, mesic Typic Medisaprists	304	25

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
59	Lisbon	Fine-silty, mixed, mesic Aquic Argiudolls	94	12
81	Littleton	Fine-silty, mixed, mesic Cumulic Hapludolls	91	11
265	Lomax	Coarse-loamy, mixed, mesic Cumulic Hapludolls	195	22
394	Longlois	Fine-loamy, mixed, mesic Mollic Hapludalfs	167	48
572	Loran	Fine-silty, mixed, mesic Aquic Argiudolls	252	56
318	Lorenzo	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls	154	20
167	Lukin	Fine-silty, mixed, mesic Typic Argialbolls	30	6
176	Marissa	Fine-silty, mixed, mesic Argiaquic Argialbolls	132	46
531	Markham	Fine, illitic, mesic Mollic Hapludalfs	113	44
467	Markland	Fine, mixed, mesic Typic Hapludalfs	137	46
549	Marseilles	Fine-silty, mixed, mesic Typic Hapludalfs	256	56
393	Marseilles, gray subs.	Fine, montmorillonitic, mesic Aquic Hapludalfs	256	56
772	Marshan	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplaquolls	162	20
570	Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs	173	49
189	Martinton	Fine, illitic, mesic Aquic Argiudolls	134	19
753	Massbach	Fine-silty, mixed, mesic Mollic Hapludalfs	253	56
342	Matherton	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Udollic Ochraqualfs	157	48
89	Maumee	Sandy, mixed, mesic Typic Haplaquolls	182	22
248	McFain	Clayey over loamy, montmorillonitic, mesic Fluvaquentic Haplaquolls	291	24
173	McGary	Fine, mixed, mesic Aeric Ochraqualfs	137	46
310	McHenry	Fine-loamy, mixed, mesic Typic Hapludalfs	111	43
682	Medway	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls	267	24
497	Mellott	Fine-silty, mixed, mesic Mollic Hapludalfs	98	42
205	Metea	Loamy, mixed, mesic Arenic Hapludalfs	107	42, 43
27	Miami	Fine-loamy, mixed, mesic Typic Hapludalfs	102	42
685	Middletown	Fine-silty, mixed, mesic Typic Hapludalfs	62	38
69	Milford	Fine, mixed, mesic Typic Haplaquolls	134	19
187	Milroy	Fine-loamy, mixed, mesic Mollic Ochraqualfs	176	21
219	Millbrook	Fine-silty, mixed, mesic Udollic Ochraqualfs	83	41
82	Millington	Fine-loamy, mixed (calcareous), mesic Cumulic Haplaquolls	265	24
317	Millsdale	Fine, mixed, mesic Typic Argiaquolls	217	23
295	Mokena	Fine-loamy, mixed, mesic Aquic Argiudolls	127	16, 17
448	Mona	Fine-loamy, mixed, mesic Typic Argiudolls	127	16, 17
229	Monee	Fine, illitic, mesic Mollic Ochraqualfs	121	16, 17
465	Montgomery	Fine, mixed, mesic Typic Haplaquolls	136	18, 19
57	Montmorenci	Fine-loamy, mixed, mesic Aquollic Hapludalfs	101	42
194	Morley	Fine, illitic, mesic Typic Hapludalfs	114	44
501	Morocco	Mixed, mesic Aquic Udipsamments	181	50
268	Mt. Carroll	Fine-silty, mixed, mesic Mollic Hapludalfs	3	31
442	Mundelein	Fine-silty, mixed, mesic Aquic Argiudolls	85	11
453	Muren	Fine-silty, mixed, mesic Aquic Hapludalfs	17, 228, 243	33, 52, 53
41	Muscatine	Fine-silty, mixed, mesic Aquic Hapludolls (most Muscatine in Illinois is in Aquic Argiudolls)	8	2
638	Muskego	Coprogenous, euic, mesic Limnic Medisaprists	308	25
425	Muskingum	Fine-loamy, mixed, mesic Typic Dystrochrepts	235	53, 54, 55
414	Myrtle	Fine-silty, mixed, mesic Mollic Hapludalfs	59	37
649	Nachusa	Fine-loamy, mixed, mesic Aquic Argiudolls	42	11
592	Nameoki	Fine, montmorillonitic, mesic Fluvaquentic Hapludolls	289	24
228	Nappanee	Fine, illitic, mesic Aeric Ochraqualfs	120, 126	45
731	Nasset	Fine-silty, mixed, mesic Mollic Hapludalfs	213	51
585	Negley	Fine-loamy, mixed, mesic Typic Paleudalfs	48	33, 34, 35, 36
976, 977	Neotoma	Loamy-skeletal, mixed, mesic Ultic Hapludalfs	231	53, 54, 55
218	Newberry	Fine-silty, mixed, mesic Mollic Ochraqualfs	32	6
928	New Glarus	Fine-silty over clayey, mixed, mesic Typic Hapludalfs	209	51

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
261	Niota	Fine, mixed, mesic Mollic Albaqualfs	139	46
568	Niota, thin A		140	46
741	Oakville	Mixed, mesic Typic Udipsamments	183	50
387	Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs	168	48
113	Oconee	Fine, montmorillonitic, mesic Udollic Ochraqualfs	27	5
656	Octagon	Fine-loamy, mixed, mesic Mollic Hapludalfs	101	42
490	Odell	Fine-loamy, mixed, mesic Aquic Argiudolls	100	12
412	Ogle	Fine-silty, mixed, mesic Typic Argiudolls	57	7
574	Ogle, sil. sub.	Fine-silty, mixed, mesic Typic Argiudolls	58	7
84	Okaw	Fine, montmorillonitic, mesic Typic Albaqualfs	143	46
289	Omaha	Coarse-loamy, mixed, mesic Aquic Hapludolls	153	20
150	Onarga	Coarse-laomy, mixed, mesic Typic Argiudolls	191	22
673	Onarga, red subs.	Coarse-loamy, mixed, mesic Typic Argiudolls	192	22
752	Oneco	Fine-loamy, mixed, mesic Mollic Hapludalfs	206	51
200	Orio	Fine-loamy, mixed, mesic Mollic Ochraqualfs	174	21
415	Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents	274	57
76	Otter	Fine-silty, mixed, mesic Cumulic Haplaquolls	282	24
100	Palms	Loamy, mixed, euic, mesic Terric Medisaprists	306	25
429	Palsgrove	Fine-silty, mixed, mesic Typic Hapludalfs	214	51
256	Pana	Fine-loamy, mixed, mesic Typic Argiudolls	47	4, 5, 6
42	Papineau	Fine-loamy over clayey, mixed, mesic Aquic Argiudolls	128	16, 17
15	Parke	Fine-silty, mixed, mesic Ultic Hapludalfs	49	33, 34, 35, 36
619	Parkville	Clayey over loamy, montmorillonitic, mesic Fluvaquentic Hapludolls	291	24
221	Parr	Fine-loamy, mixed, mesic Typic Argiudolls	100	12
142	Patton	Fine-silty, mixed, mesic Typic Haplaquolls	131	18
21	Pecatonica	Fine-loamy, mixed, mesic Typic Hapludalfs	56	37
153	Pella	Fine-silty, mixed, mesic Typic Haplaquolls	85, 100	9, 11, 12
330	Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls	115	9, 14
288	Petrolia	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents	277	57
474	Piasa	Fine, montmorillonitic, mesic Typic Natralbolls	35	4, 5, 6
583	Pike	Fine-silty, mixed, mesic Ultic Hapludalfs	51	33, 34, 35
159	Pillot	Fine-silty over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls	65	8
420	Piopolis	Fine-silty, mixed, acid, mesic Typic Fluvaquents	278	57
54	Plainfield	Mixed, mesic Typic Udipsamments	181	50
199	Plano	Fine-silty, mixed, mesic Typic Argiudolls	72	11
240	Plattville	Fine-loamy, mixed, mesic Typic Argiudolls	221	23
277	Port Byron	Fine-silty, mixed, mesic Typic Hapludolls	1	1
562	Port Byron sandy sub.	Fine-silty, mixed, mesic Typic Hapludolls	2	1
650	Prairieville	Fine-loamy, mixed, mesic Typic Argiudolls	42	11
148	Proctor	Fine-silty, mixed, mesic Typic Argiudolls	82	11
109	Racoon	Fine-silty, mixed, mesic Typic Ochraqualfs	34	36
430	Raddle	Fine-silty, mixed, mesic Typic Hapludolls	92	11
74	Radford	Fine-silty, mixed, mesic Fluvaquentic Hapludolls	283	24
238	Rantoul	Fine, montmorillonitic, mesic Vertic Haplaquolls	122	16, 17
481	Raub	Fine-silty, mixed, mesic Aquic Argiudolls	97	12
594	Reddick	Fine-loamy, mixed, mesic Typic Haplaquolls	116, 127	15, 16, 17
723	Reesville	Fine-silty, mixed, mesic Aeric Ochraqualfs	14, 133	31, 32, 33, 46
4	Richview	Fine-silty, mixed, mesic Mollic Hapludalfs	29	6
151	Ridgeville	Coarse-loamy, mixed, mesic Aquic Argiudolls	191	22
743	Ridott	Fine-silty, mixed, mesic Mollic Ochraqualfs	253	56
452	Riley	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Fluvaquentic Hapludolls	263	24
297	Ringwood	Fine-loamy, mixed, mesic Typic Argiudolls	110	13
324	Ripon	Fine-silty, mixed, mesic Typic Argiudolls	210	23

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
311	Ritchey	Loamy, mixed, mesic Lithic Hapludalfs	200	51
335	Robbs	Fine-silty, mixed, mesic Aquic Fragiudalfs	248	55
184	Roby	Coarse-loamy, mixed, mesic Aquic Hapludalfs	193	50
503	Rockton	Fine-loamy, mixed, mesic Typic Argiudolls	217	23
93	Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls	146	20
316	Romeo	Loamy, mixed, mesic Lithic Haplaquolls	198	23
73	Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls	266	24
230	Rowe	Fine, mixed, mesic Typic Argiaquolls	124	17
279	Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs	13	32
178	Ruark	Fine-loamy, mixed, mesic Typic Ochraqualfs	193	50
791	Rush	Fine-silty, mixed, mesic Typic Hapludalfs	90	41
16	Rushville	Fine, montmorillonitic, mesic Typic Albaqualfs	22, 26	34
322	Russell	Fine-silty, mixed, mesic Typic Hapludalfs	99	42
375	Rutland	Fine, montmorillonitic, mesic Aquic Argiudolls	70	10
236	Sabina	Fine, montmorillonitic, mesic Aeric Ochraqualfs	69	39
68	Sable	Fine-silty, mixed, mesic Typic Haplaquolls	8, 18	2, 3
956	Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults	247	54
92	Sarpy	Mixed, mesic Typic Udipsamments	257	57
774	Saude	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludolls	151	20
107	Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls	285	24
145	Saybrook	Fine-silty, mixed, mesic Typic Argiudolls	94	12
370	Saylesville	Fine, illitic, mesic Typic Hapludalfs	135	46
418	Schapville	Fine, mixed, mesic Typic Argiudolls	250	56
462	Sciotoville	Fine-loamy, mixed, mesic Aquic Fragiudalfs	177	49
274	Seaton	Fine-silty, mixed, mesic Typic Hapludalfs	4	31
563	Seaton, sandy sub.	Fine-silty, mixed, mesic Typic Hapludalfs	5	31
125	Selma	Fine-loamy, mixed, mesic Typic Haplaquolls	172	21
508	Selma, br. sub.	Fine-loamy, mixed, mesic Typic Haplaquolls	221	23
208	Sexton	Fine, montmorillonitic, mesic Typic Ochraqualfs	84	41
555	Shadeland	Fine-loamy, mixed, mesic Aeric Ochraqualfs	236	56
72	Sharon	Coarse-silty, mixed, acid, mesic Typic Udifluvents	272	57
138	Shiloh	Fine, montmorillonitic, mesic Cumulic Haplaquolls	297	24
424	Shoals	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents	264	57
745	Shullsburg	Fine, mixed, mesic Aquic Argiudolls	250	56
55	Sidell	Fine-silty, mixed, mesic Typic Argiudolls	97	12
504	Sogn	Loamy, mixed, mesic Lithic Haplustolls	201	23
88	Sparta	Sandy, mixed, mesic Entic Hapludolls	180	22
243	St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs	74	41
560	St. Clair	Fine, illitic, mesic Typic Hapludalfs	120, 126	45
132	Starks	Fine-silty, mixed, mesic Aeric Ochraqualfs	84	41
155	Stockland	Loamy-skeletal, mixed, mesic Typic Hapludolls	147	20
665	Stonelick	Coarse-loamy, mixed (calcareous), mesic Typic Udifluvents	260	57
253	Stonington	Coarse-loamy, mixed, mesic Typic Hapludalfs	148	48
164	Stoy	Fine-silty, mixed, mesic Aquic Hapludalfs	28, 244	35, 54
224	Strawn	Fine-loamy, mixed, mesic Typic Hapludalfs	104	42, 43
435	Streator	Fine, montmorillonitic, mesic Typic Haplaquolls	70	10
278	Stronghurst	Fine-silty, mixed, mesic Aeric Ochraqualfs	13	32
234	Sunbury	Fine, montmorillonitic, mesic Aquollic Hapludalfs	68	39
91	Swygert	Fine, mixed, mesic Aquic Argiudolls	118	16
19	Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs	14	31, 32, 33
294	Symerton	Fine-loamy, mixed, mesic Typic Argiudolls	116	15
34	Tallula	Coarse-silty, mixed, mesic Typic Hapludolls	6	1, 2, 3
36	Tama	Fine-silty, mixed, mesic Typic Argiudolls	8, 18, 23	2, 3, 4
581	Tamalco	Fine, montmorillonitic, mesic Typic Natrudalfs	36	4, 5, 6
565	Tell	Fine-silty over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	64	20
587	Terril	Fine-loamy, mixed, mesic Cumulic Hapludolls	268	24
212	Thebes	Fine-silty over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs	66	38

Alphabetical List of Illinois Soils (continued)

No.	Series	Family	Line in Soil Key	Soil association area
206	Thorp	Fine-silty, mixed, mesic Argiaquic Argialbolls	79	11
284	Tice	Fine-silty, mixed, mesic Fluvaquentic Hapludolls	284	24
271	Timula	Coarse-silty, mixed, mesic Typic Eutrochrepts	7	31
404	Titus	Fine, montmorillonitic, mesic Fluvaquentic Haplaquolls	296	24
353	Toronto	Fine-silty, mixed, mesic (Mollic) Udollic Ochraqualfs	98	42
633	Traer	Fine, montmorillonitic, mesic Typic Ochraqualfs	13	32
765	Trempealeau	Fine-loamy over sandy or sandy-skeletal, mixed mesic Typic Argiudolls	169	21
197	Troxel	Fine-silty, mixed, mesic Typic Argiudolls	78	11
482	Uniontown	Fine-silty, mixed, mesic Typic Hapludalfs	133	46
605	Ursa	Fine, montmorillonitic, mesic Typic Hapludalfs	41	32, 33, 34, 35, 36
223	Varna	Fine, illitic, mesic Typic Argiudolls	112	14
250	Velma	Fine-loamy, mixed, mesic Typic Argiudolls	38	3, 4, 5, 6
50	Virden	Fine, montmorillonitic, mesic Typic Argiaquolls	23	4
104	Virgil	Fine-silty, mixed, mesic Udollic Ochraqualfs	73	41
83	Wabash	Fine, montmorillonitic, mesic Vertic Haplaquolls	299	24
26	Wagner	Fine, montmorillonitic, mesic Mollic Albaqualfs	142	46
333	Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents	271	57
292	Wallkill	Fine-loamy, mixed, nonacid, mesic Thapto-Histic Fluvaquents	269	57
584	Walshville	Fine, mixed, mesic Typic Natrudalfs	37	4, 5, 6
456	Ware	Coarse-loamy, mixed, thermic Fluventic Hapludolls	262	24
290	Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls	156	20
215	Wartrace	Fine-silty, mixed, mesic Typic Hapludalfs	28, 244	35, 54
296	Washtenaw	Fine-loamy, mixed, nonacid, mesic Typic Haplaquents	275	57
49	Watseka	Sandy, mixed, mesic Aquic Hapludolls	180	22
697	Wauconda	Fine-silty, mixed, mesic Udollic Ochraqualfs	86	41
727	Waukee	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludolls	162	20
564	Waukegan	Fine-silty over sandy or sandy-skeletal, mixed, mesic Typic Hapludolls	63	8
369	Waupecan	Fine-silty, mixed, mesic Typic Argiudolls	88	11
398	Wea	Fine-loamy, mixed, mesic Typic Argiudolls	166	20
461	Weinbach	Fine-silty, mixed, mesic Aeric Fragiaqualfs	177	49
165	Weir	Fine, montmorillonitic, mesic Typic Ochraqualfs	28, 244	35, 54
339	Wellston	Fine-silty, mixed, mesic Ultic Hapludalfs	240	53, 54, 55
388	Wenona	Fine, montmorillonitic, mesic Typic Argiudolls	70	10
141	Wesley	Coarse-loamy, mixed, mesic Aquic Hapludolls	117	14, 15, 19
300	Westland	Fine-loamy, mixed, mesic Typic Argiaquolls	153, 166	20
940	Westmore	Fine-silty, mixed, mesic Typic Hapludalfs	242	53, 54
22	Westville	Fine-loamy, mixed, mesic Typic Hapludalfs	53	37
509	Whalan	Fine-loamy, mixed, mesic Typic Hapludalfs	218	51
463	Wheeling	Fine-loamy, mixed, mesic Ultic Hapludalfs	177	49
571	Whitaker	Fine-loamy, mixed, mesic Aeric Ochraqualfs	173	49
116	Whitson	Fine-silty, mixed, mesic Typic Ochraqualfs	14	31, 32, 33
329	Will	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplaquolls	156	20
348	Wingate	Fine-silty, mixed, mesic Mollic Hapludalfs	98	42
728	Winnebago	Fine-loamy, mixed, mesic Typic Argiudolls	52	7
410	Woodbine	Fine-loamy, mixed, mesic Typic Hapludalfs	207	51
37	Worthen	Fine-silty, mixed, mesic Cumulic Hapludolls	91	11
12	Wynoose	Fine, montmorillonitic, mesic Typic Albaqualfs	33	36
291	Xenia	Fine-silty, mixed, mesic Aquic Hapludalfs	99	42
340	Zanesville	Fine-silty, mixed, mesic Typic Fragiudalfs	241	53, 54, 55
524	Zipp	Fine, mixed, nonacid, mesic Typic Haplaquepts	137	46
696	Zurich	Fine-silty, mixed, mesic Typic Hapludalfs	87	41
576	Zwingle	Fine, montmorillonitic, mesic Typic Albaqualfs	141	46

Numerical List of Illinois Soils and Soil Association Areas

Soil series no. and name	Soil association area
2 Cisne	6
3 Hoyleton	6
4 Richview	6
5 Blair	31,32,33,34,35,36
6 Fishhook	32,34
7 Atlas	32,33,34,35,36
8 Hickory	31,32,33,34,35,36
12 Wynoose	36
13 Bluford	36
14 Ava	36
15 Parke	33,34,35,36
16 Rushville	34
17 Keomah	34
18 Clinton	34
19 Sylvan	31,32,33
21 Pecatonica	37
22 Westville	37
23 Blount	44
24 Dodge	42
25 Hennepin	39,42,43
26 Wagner	46
27 Miami	42
28 Jules	57
29 Dubuque	51
30 Hamburg	31,32,33
34 Tallula	1,2,3
35 Bold	31,32,33
36 Tama	2,3,4
37 Worthen	11
40 Dodgeville	23
41 Muscatine	2
42 Papineau	16,17
43 Ipava	3
45 Denny	2,3
46 Herrick	4
48 Ebbert	6
49 Watseka	22
50 Virden	4
53 Bloomfield	50
54 Plainfield	50
55 Sidell	12
56 Dana	12
57 Montmorenci	42
59 Lisbon	12
60 La Rose	12,13
61 Atterberry	32
62 Herbert	42
67 Harpster	2,3,9,11
68 Sable	2,3
69 Milford	19
70 Beaucoup	24
71 Darwin	24
72 Sharon	57
73 Ross	24
74 Radford	24
75 Drury	41
76 Otter	24
77 Huntsville	24
78 Arenzville	57
81 Littleton	11
82 Millington	24
83 Wabash	24
84 Okaw	46
85 Jacob	57
87 Dickinson	22
88 Sparta	22
89 Maumee	22
91 Swygert	16
92 Sarpy	57
93 Rodman	20
97 Houghton	25
98 Ade	22
100 Palms	25
102 La Hogue	21
103 Houghton	25
104 Virgil	41
105 Batavia	41
107 Sawmill	24
108 Bonnie	57
109 Racoon	36
112 Cowden	5
113 Oconee	5
116 Whitson	31,32,33
119 Elco	32,33,34
120 Huey	4,5,6
122 Colp	46
125 Selma	21
127 Harrison	4,5
128 Douglas	4,5
131 Alvin	50
132 Starks	41
134 Camden	41
136 Brooklyn	11
137 Ellison	48
138 Shiloh	24
141 Wesley	14,15,19
142 Patton	18
145 Saybrook	12
146 Elliott	14
147 Clarence	17
148 Proctor	11
149 Brenton	11
150 Onarga	22
151 Ridgeville	22
152 Drummer	9,11,12
153 Pella	9,11,12
154 Flanagan	9
155 Stockland	20
159 Pillot	8
162 Gorham	24
164 Stoy	35,54
165 Weir	35,54
167 Lukin	6
171 Catlin	9
172 Hoopeston	22
173 McGary	46
175 Lamont	50
176 Marissa	46
178 Ruark	50
180 Dupo	57
184 Roby	50
187 Milroy	21
188 Beardstown	21
189 Martinton	19
191 Knight	11
192 Del Rey	46
194 Morley	44
196 Lemond	11
197 Troxel	11
198 Elburn	11
199 Plano	11
200 Orio	21
201 Gilford	22
204 Ayr	12,13
205 Metea	42,43
206 Thorp	11
208 Sexton	41
210 Lena	25
212 Thebes	38
214 Hosmer	35,54
218 Newberry	6
219 Millbrook	11
221 Parr	12
223 Varna	14
224 Strawn	42,43
227 Argyle	37
228 Nappanee	45
229 Monee	16,17
230 Rowe	17
232 Ashkum	14
233 Birkbeck	39
234 Sunbury	39
235 Bryce	16
236 Sabina	39
238 Rantoul	16,17
239 Dorchester	57
240 Plattville	23
241 Chatsworth	44,45
242 Kendall	41
243 St. Charles	41
244 Hartsburg	3
248 McFain	24
249 Edinburg	3
250 Velma	3,4,5,6
253 Stonington	48
256 Pana	4,5,6
257 Clarksdale	34
259 Assumption	2,3,4
261 Niota	46
262 Denrock	19
264 El Dara	34
265 Lomax	22

Numerical List of Illinois Soils and Soil Association Areas (continued)

Soil series no. and name	Soil association area
266 Disco	22
268 Mt. Carroll	31
271 Timula	31
272 Edgington	1,2
274 Seaton	31
275 Joy	1
277 Port Byron	1
278 Stronghurst	32
279 Rozetta	32
280 Fayette	32
282 Chute	50
284 Tice	24
286 Carmi	20
287 Chauncey	6
288 Petrolia	57
289 Omaha	20
290 Warsaw	20
291 Xenia	42
292 Wallkill	57
293 Andres	15
294 Symerton	15
295 Mokena	16,17
296 Washtenaw	57
297 Ringwood	13
298 Beecher	44
300 Westland	20
301 Grantsburg	55
302 Ambraw	24
304 Landes	24
306 Allison	24
307 Iona	31,32,33
308 Alford	33,52,53
310 McHenry	43
311 Ritchey	51
312 Edwards	25
314 Joliet	23
315 Channahon	23
316 Romeo	23
317 Millsdale	23
318 Lorenzo	20
320 Frankfort	45
321 Du Page	24
322 Russell	42
323 Casco	48
324 Ripon	23
325 Dresden	48
326 Homer	48
327 Fox	48
329 Will	20
330 Peotone	9,14
331 Haymond	57
332 Billett	50
333 Wakeland	57
334 Birds	57
335 Robbs	55
337 Creal	36
338 Hurst	46
339 Wellston	53,54,55
340 Zanesville	53,54,55
342 Matherton	48
343 Kane	20
344 Harvard	41
346 Dowagiac	48
347 Canisteo	11
348 Wingate	42
353 Toronto	42
354 Hononegah	20
361 Kidder	43
363 Griswold	13
365 Aptakisic	41
369 Waupecan	11
370 Saylesville	46
375 Rutland	10
379 Dakota	20
380 Fieldon	20
382 Belknap	57
386 Downs	32,34
387 Ockley	48
388 Wenona	10
389 Hesch, thin to ss	56
390 Hesch	56
393 Marseilles, gray subs.	56
397 Boone	56
398 Wea	20
400 Calco	24
402 Colo	24
404 Titus	24
410 Woodbine	51
411 Ashdale	23
412 Ogle	7
413 Gale	56
414 Myrtle	37
415 Orion	57
416 Durand	7
417 Derinda	56
418 Schapville	56
419 Flagg	37
420 Piopolis	57
421 Kell	36
422 Cape	57
424 Shoals	57
425 Muskingum	53,54,55
426 Karnak	57
427 Burnside	57
428 Coffeen	11
429 Palsgrove	51
430 Raddle	11
431 Genesee	57
435 Streator	10
440 Jasper	21
442 Mundelein	11
443 Barrington	11
444 Bungay	46,57
448 Mona	16,17
451 Lawson	24
452 Riley	24
453 Muren	33,52,53
454 Iva	33,52,53
456 Ware	24
457 Booker	19,24
460 Ginat	49
461 Weinbach	49
462 Sciotoville	49
463 Wheeling	49
465 Montgomery	18,19
467 Markland	46
469 Emma	49
470 Keller	2,3,4
471 Clarksville (or Bodine)	52
472 Baylis	52
474 Piasa	4,5,6
475 Elsah	57
481 Raub	12
482 Uniontown	46
484 Harco	18
490 Odell	12
493 Bonfield	23
494 Kankakee	23
495 Corwin	12
496 Fincastle	42
501 Morocco	50
503 Rockton	23
504 Sogn	23
505 Dunbarton	51
506 Hitt	23
508 Selma, br. sub.	23
509 Whalan	51
511 Dunbarton, chr.	51
513 Granby	22
516 Faxon	23
524 Zipp	46
531 Markham	44
537 Hesch, gray subs.	56
546 Keltner	56
547 Eleroy	56
549 Marseilles	56
551 Gosport	56
554 Kernan	45
555 Shadeland	56
556 High Gap	56
560 St. Clair	45
562 Port Byron, san. sub.	1
563 Seaton, san. sub.	31
564 Waukegan	8
565 Tell	38
567 Elkhart	3
568 Niota, thin A	46
570 Martinsville	49

Numerical List of Illinois Soils and Soil Association Areas (continued)

Soil series no. and name	Soil association area
571 Whitaker	49
572 Loran	56
574 Ogle, sil. sub.	7
576 Zwingle	46
578 Dorchester, cobbly	57
581 Tamalco	4,5,6
583 Pike	33,34,35
584 Walshville	4,5,6
585 Negley	33,34,35,36
587 Terril	24
589 Bowdre	24
590 Cairo	24
591 Fults	24
592 Nameoki	24
594 Reddick	15,16,17
597 Armiesburg	24
598 Bedford	52
599 Baxter	52
600 Huntington	24
603 Blackoar	24
605 Ursa	32,33,34,35,36
606 Goss	52
609 Crane	20
619 Parkville	24
620 Darmstadt	4,5,6
628 Lax	54
633 Traer	32
638 Muskego	25

Soil series no. and name	tion area Soil associa-
647 Lawler	20
649 Nachusa	11
650 Prairieville	11
656 Octagon	42
660 Coatsburg	4,5,6
661 Atkinson	23
665 Stonelick	57
670 Aholt	19
673 Onarga, red subs.	22
682 Medway	24
683 Lawndale	8
684 Broadwell	8
685 Middletown	38
691 Beasley	54,55
696 Zurich	41
697 Wauconda	41
698 Grays	41
706 Boyer	48
723 Reesville	31,32,33,46
727 Waukee	20
728 Winnebago	7
731 Nasset	51
740 Darroch	21
741 Oakville	50
742 Dickinson, loamy sub.	22
743 Ridott	56
745 Shullsburg	56

Soil series no. and name	Soil association area
746 Calamine	56
752 Oneco	51
753 Massbach	56
761 Eleva	56
763 Joslin	11,19
764 Coyne	11,19
765 Trempealeau	21
768 Backbone	51
769 Edmund	23
771 Hayfield	48
772 Marshan	20
774 Saude	20
776 Comfrey	24
777 Adrian	25
779 Chelsea	50
780 Grellton	49
781 Friesland	21
782 Juneau	57
783 Flagler	20
786 Frondorf	35,36
787 Banlic	57
791 Rush	41
792 Bowes	41
928 New Glarus-Palsgrove	51
956 Brandon-Saffell	54
961 Burkhardt-Saude	20
977 Neotoma	53,54,55