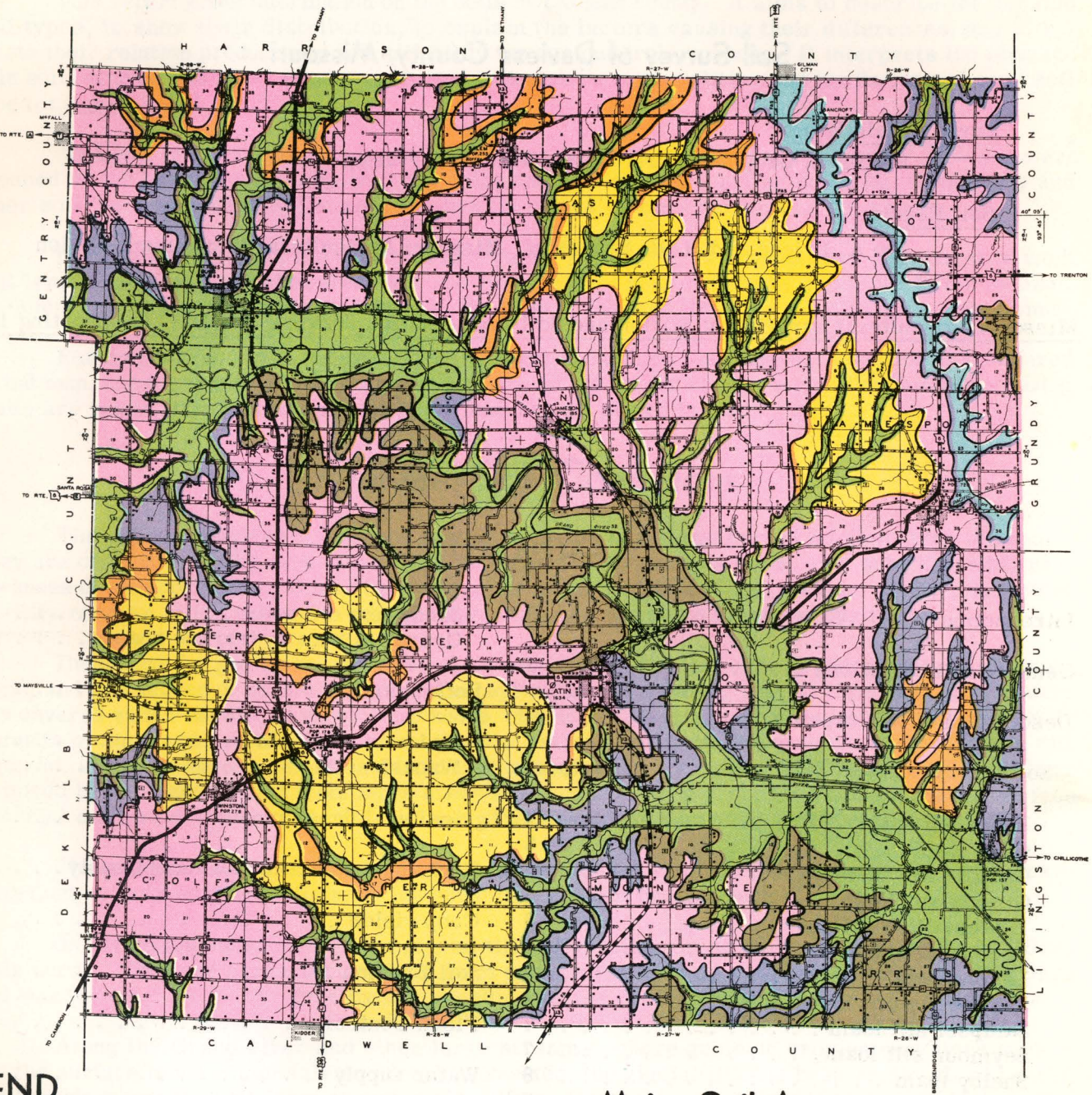
Soils of Daviess County, Missouri



LEGEND

- Edina
- Grundy-Seymour-Shelby
- Lacona-Sampsel-Snead
- Gara
- Mandeville-Keytesville-Snead
- Shelby
- Wabash-Nodaway

Major Soil Areas

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE
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Soil Survey of Daviess County, Missouri

Survey Field Work

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Soil Report

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Missouri Agricultural Experiment Station and Soil Conservation Service, U.S.D.A. Cooperating 1953

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Introduction

This report gives information on the soils of Daviess county. It aims to describe the various soil types, to show their distribution, to explain the factors causing their differences, and to indicate their relative productivity and suitability for agricultural purposes. It interprets the observable soil features that affect plant growth, and indicates the potentialities and limitations of each soil type for agricultural use.

The soil map on the front cover of the report shows the general soil areas. The soils are grouped on the basis of their similarity in color and profile, soil forming material, topography and other soil features. Each of the areas is briefly named on the first page of the report.

The large soil map of the county in four parts, page 23, shows the location and extent of each soil type. Each type of delineated by a red line. Each area on the map has a red letter symbol. By comparing the symbol with the legend at the base of the map, the type of soil can be determined.

For convenience in locating a farm, or tract of land, on the map, each section is numbered on the map, and the township and range numbers are on the border of the map. Other aids in locating a site are roads, streams, towns and other features all shown in black.

General Soil Conditions

The soils of Daviess county are similar to those of a large part of northwestern Missouri. They are characterized by dark color, medium texture of the surface soils, clay subsoils, and great thickness of the soil mantle. Other features are the average high fertility, medium acidity, sufficient fertility reserve in the unweathered minerals, and good moisture retaining qualities.

The underlying geological structure of Daviess county consists of interbeded shales and limestone, and thin lenses of sandstone, all of Pennsylvanian age. During glacial time the entire county was covered with a mantle, of varying thickness, of glacial till--a mixture of clay and silt and small amounts of sand and gravel. At a later time the entire county was covered with a wind blown silt material, known as loess, which varied from four to six feed in thickness. The loess mantle has been removed by geologic erosion from large areas in the county. The glacial till now forms the surface material on most of the strongly rolling land. The loess remains on the gently rolling upland.

The soils derived from the loess include the Edina, Grundy and Seymour types -- all characterized by silty surface soils and clay subsoils. All had prairie vegetation.

On the rolling upland where the glacial till is the soil forming material, the Shelby and Gara soils occur. They are characterized by a loam surface texture and sandy clay subsoils. The Gara soil was forested. It is therefore lighter in color than the Shelby which was predominantly prairie.

Along the Grand river and other large streams, where geologic erosion was more severe and the surface more completely and deeply dissected, the glacial till has been removed, and shale and limestone are the soil-forming materials. Where the shales are calcareous or interbeded with limestone, the soils are dark in color and contain much clay. The soils include the Lacona, Sampsel and Snead types. Where non-calcareous shales occur, the resulting soils are lighter in color and in texture. These include the Mandeville, Gosport, and Keytesville types.

In general, the residual soils are not as highly weathered as those derived from loess or till, and therefore do not have as highly developed or distinct profiles. The thickness of the soil mantle also, is more variable, and bedrock may be at the surface in places.

The extensive alluvial or bottomland soils all are medium to fine in texture -- mainly silt loams and clay. These textures are due to the low gradient of the streams that can carry fine material only, and to the fine material eroded from the upland.

The relation of the different soils to the soil-forming material, and to the topography, is illustrated in the diagrams Figs. 1, 2, 3 pages 20, 21, 22.

Following are the descriptions of soil types, arranged in alphabetical order, and in groups for uplands, benchlands, and bottomlands.

TABLE 1 -- ACREAGE AND PROPORTIONATE EXTENT OF SOILS IN DAVIESS COUNTY, MISSOURI

Symbol	Type Name	Predominant Slope (Percent)	Acres	Percent of Total area
	Uplands			
Ea	Edina silt loam	0-4	4,930	1.36
Ga	Gara loam	3-8	7,470	2.07
Gc	Gara loam	9-18	12,220	3.39
Gd	Gosport silt loam	8-20	6,920	1.92
Ge	Grundy silt loam	1-4	53,670	14.88
Ka	Keytesville silt loam	3-7	7,210	2.00
La	Lacona silt loam	2-8	10,300	2.85
Lc	Lacona silt loam	9-15	5,060	1.40
Ld	Lagonda silt loam	2-8	29.370	8.13
Ma	Madeville silt loam	2-5	4,030	1.12
Mb	Mandeville silt loam	6-10	2,170	0.60
Sh	Sampsel silt loam	5-15	7,130	1.97
Sa	Seymour silt loam	1-4	13.930	3.86
Sb	Shelby loam	4-8	63,040	17.46
Sd	Shelby loam	9-15	21.360	5.92
Sf	Snead silty clay	6-15	5,380	1.49
Sg	Snead stony silty clay	8-20	14.100	3.91
	Total Upland Soils		268.290	74.32
	Terraces or Second Bottoms			
Ba	Blockton silt loam	0-4	2,340	0.65
Ca	Burrell silt loam	0-3	2,320	0.64
Cb	Edina silt loam, terrace phase	0-3	1,980	0.55
Cc	Sandy terrace soils	0-3	490	0.14
Gf	Grundy silt loam, terrace phase	0-4	2,800	0.78
	Total Terrace Soils		9,930	2.76
	Bottomlands			
Na	Nodaway silt loam		34,110	9.45
Wa	Wabash silt loam		31,670	8.78
Wb	Wabash silt clay loam		7,200	1.99
Wc	Wabash clay		9.760	2.70
	Total Bottomland Soils		82,740	22.92
	TOTAL COUNTY		360,960	100.00

Description of Soil Types

SOILS OF UPLAND

EDINA SILT LOAM

Edina silt loam (0-2 percent slope) is a moderately dark colored soil that occurs on the level prairie in the northeastern part of the county. It is surrounded by and closely related to the Grundy and Seymour soils. The Edina differs from the Grundy and Seymour in that it has a lighter colored surface soil, and a more compact subsoil.

Soil profile. The surface soil varying in depth from ten to twelve inches, is a dary gray to grayish brown friable silt loam. This grades into a gray silty subsurface that averages about six

inches in thickness. The distinct "claypan" subsoil below sixteen to eighteen inches, is a very dark gray plastic clay, with gray and yellow stains. The subsoil below thirty to thirty-six inches is a dull gray plastic silty clay, mottled brown and yellow. It containing less clay than the horizon above. The gray, moderately plastic lower subsoil may extend to a depth of five or more feet.

Variations. The thickness of the gray silty subsurface varies, but usually is most highly developed on level areas.

Adaptation and management. Surface drainage is slow because of the nearly level relief. The internal drainage is hindered by the compact subsoil. Drainage by tile is not feasible, but is provided by shallow surface ditches. In dry or wet seasons crops may be damaged more on these soils than on soils that have a more permeable structure. All of the Edina silt loam is in cultivation. Corn, oats, soybeans, and grass are the major crops. Crop yields average slightly lower than on the Grundy soil, especially in wet seasons.

GARA LOAM

Gara loam (2-8 and 8-15 percent slope) is a medium dark soil, formed from gladical till under a transition prairie-forest type of vegetation. It has a sharply rolling topography similar to that of the closely related Shelby loam.

Soil Profile. The surface soil is a grayish-brown friable loam varying widely but averaging eight inches in depth. With increase of depth it grades into a heavier and less friable material. The subsoil below twelve to fifteen inches is a yellow-brown plastic clay loam, with gray mottling. Increase in depth gives little change except an increase in brown and yellow mottlings. Lime concretions may occur at a depth of five or more feet.

Adaptation and Management. Much of the Gara loam on the gentler slopes is in clutivation. Corn and grass are the main crops. Yields are lower, and pastures are inferior to those on the Shelby loam. Steeper slopes are not suited for cultivation, and are in pasture or remain forested. This is one of the most desirable soil types for the establishment of wood lots. This soil is medium in productivity. Its ease of erosion is a limiting facfor in its use. Permanent pasture should be the major land use.

GOSPORT SILT LOAM

Gosport silt loam, (8-25 percent slope) is a light colored, shallow soil formed from Pennsylvanian shales, under forest vegetation. It occurs on strongly sloping topography in association with the Snead, Mandeville, and Gara soils.

Soil Profile. The surface soil consists of a pale brown or yellowish brown fiable silt loam, or even loam, of approximately ten inches in depth. Beneath this there is partly weathered, silty shale of yellowish brown color.

Adaptation and Management. Because the natural fertility level and organic matter content are low in this more erodible shallow soil with low water-holding capacity, the Gosport silt loam is used mainly for pasture and woodlots. The land is not suited for cultivation or good pastures.

GRUNDY SILT LOAM

The Grundy silt loam (1-4 percent slope) is the characteristic dark prairie soil of the county and of this region. It represents most of the gently rolling upland. It is similar to the Edina and Seymour soils, but differs in its darker color of the surface.

Soil Profile. The surface soil, is a very dark brown, mellow, silt loam, grading at about twelve inches into a slightly heavier material that extends to a depth of sixteen to eighteen inches. The subsoil is a very dark gray, plastic silty clay, with small brown and yellow mottlings. Below thirty inches, it is an olive gray plastic silty clay, mottled brown and gray. From forty inches downward the soil material contains less clay and is less plastic.

Adaptation and Management. Grundy silt loam is the most desirable upland soil because of high fertility, gentle slopes and ease of tillage. All crops common to the region are extensively grown on it. Most of the soil deterioration is due to erosion. The moderate slope of the land allows contour cultivation and terracing.

KEYTESVILLE SILT LOAM

Keytesville silt loam (3-7 percent slope) is a light colored soil that occurs on gentle slopes, in the hilly and forested sections of the county. It is distingueshed by its light color and topographic position. The soil-forming material is shale, modified in places by weathered till.

Soil profile. The surface soil is a grayish-brown silt loam, varing in depth from 6-18 inches and grading at about 7 inches into a pale brown silty material. When dry, the color is almost light gray. The structure is hard and brittle. The subsoil which begins at twelve to fifteen inches, is a gray-brown plastic silty clay. It becomes heavier with increasing depth, and mottled yellow and brown.

Variations. Occasional seepy spots may have a gray color and clay subsoil.

Adaptation and Management. Keytesville silt loam is one of the least productive soils in the county. While most of it is in cultivation, it is better suited to grass than to grain crops or legumes. Because of the depth and poor structure, soil improvement is more difficult than for other upland types.

LACONA SILT LOAM

Lacona silt loam, (2-8 and 9-15 percent slopes) is a distinctly dark brown soil, with a uniform brown and permeable subsoil. It represents the decomposition of shale and limestone where these have been decomposed to a great depth, and occurs in association with other residual types -- namely Mandeville, Sampsell, and Snead. It has a rolling to hilly topography.

Soil profile. The surface soil is a dark brown friable silt loam, that grades into a uniform brown and moderately plastic silty clay loam at a depth of ten to twelve inches. The lower part of this subsoil may have dark rust stains, and may be a reddish brown clay.

Variations. The subface soil may vary in color and depth due to erosion. Spots with glacial loam soil may occur. Where the underlying bedrock is limestone, the soil has a reddish-brown color.

Adaptation and Management. The Lacona silt loam is productive and very responsive to fertilization. As indicated by the deep brown color, it has better internal drainage than any of the prairie types in Daviess County. It is adapted to corn and small grains and especially well suited to crops such as alfalfa and orchard fruits. Most of the type is in cultivation, except the steeper slopes where pasture predominates. Erosion control is a major problem. Consequently much of the land should be in permanent cover of grass and legumes.

LAGONDA SILT LOAM

Lagonda silt loam, (1-4 percent slopes) represents the indefinite soil condition formed by the transition between Grundy and Shelby soils.

Soil Profile. In all of its main profile features it is similar to Grundy. Probably the most distinct difference from Grundy is the gray plastic clay of the lower subsoil. The latter may be derived from till, whereas the lower subsoil of the Grundy is formed from loess. The surface soil of the Lagonda is a very dark gray silt loam of ten or more inches in depth. The subsoil is a stiff gray clay grading to a gray plastic clay that may contain sand grains.

Variations. The Lagonda frequently occurs at the lower end of slopes, and may be subject to erosion or deposition. The thickness of the surface soil may vary greatly over short distences.

Seepy spots may occur, and are indicated by the gray color and puddled condition of the soil. Near its border adjoining the Shelby loam, small areas of the latter type may be included.

Adaptation and Management. The Lagonda silt loam is farmed in the same way as the associated Grundy. Crop yields, however are lower because of poorer drainage and the dense clay subsoil. Soil improvement is more difficult because of erosion or deposition. Terraces to divert the runoff from the higher lying Grundy soil may be beneficial. Grasses thrive because of the abundance of moisture. Pasture and meadow are the most desirable use of the land, where seepage occurs or where the surface is gullied.

MANDEVILLE SILT LOAM

Mandeville silt loam (2-10 percent slopes) is a light brown soil that occurs in the areas where shale is the soil-forming material. It is related to, but less productive than, the Lacona silt loam. Originially forested, most of it is now cleared.

Soil Profile. The surface soil is a friable light brown silt loam that grades into a yellowish-brown friable silty clay at eight to twelve inches depth. The lower subsoil may be moderately plastic, and mottled with gray. The soil mantle is thick, and the shale rarely outcrops. Weathered glacial till may occur on the higher slopes.

Adaptation and Management. The relatively low fertility and hazard of erosion are reason why this soil type is used as permanent pasture. The content of organic matter is very low. The mineral nutients are low because they are deficient in the soil forming material.

SAMPSEL SILT LOAM

Sampsel silt loam (5-15 percent slopes) is a dark, heavy soil formed from limestone and shale. It occurs on slopes in association with Lacona and Snead soils. Originally forested, all is now cleared. It is rich in calcium, and still has a high content of organic matter.

Soil Profile. The surface soil is a very dark brown to black heavy silt loam, that becomes lighter in color and heavier in texture with increasing depth. The subsoil is a dark gray plastic silty clay, with few brown mottlings. The lower subsoil is steel gray in color and very plastic. Small areas of limestone outcrop may occur on the steeper slopes.

Adaptation and Management. The high fertility of the soil is favorable for the production of corn, grass and clover. The heavy subsoil is not favorable for deep rooting crops, and in dry seasons yields may be low. The type of farming and crop yields are similar to those on the Grundy silt loam.

SEYMOUR SILT LOAM

Seymour silt loam (1-4 percent slopes) resembling the Grundy silt loam, is a dark prairie soil, in the northeastern part of the county, it has, however, a lighter colored surface soil, and a slightly denser subsoil. It is closely related also to the Edina silt loam except for the latter's gray subsurface. The boundary between all these types is a rather arbitary one.

Soil Profile. The surface soil is a mellow dark, gray-brown silt loam, grading into a friable dark gray heavy silt loam at a depth of about twelve inches. The subsoil below sixteen inches is a dark gray plastic clay, that changes to a gray, less plastic and mottled silty clay.

Variations. The soil is uniform in its characteristics, except for small level areas similar to the lighter colored Edina silt loam.

Adaptation and Management. All of the land is intersively farmed. Crop yields are about the same as on Grundy silt loam. Lime and other fertilizers are used for clovers and the grain crops. For general farming, ease of cultivation this is one of the most desirable soils in the county.

SHELBY LOAM

Shelby loam (2-8 and 9-15 percent slopes) includes approximately twenty-three percent of the county area. It is derived from a thick mantle of glacial till. The surface is rolling to moderately hilly. Altho generally considered a prairie soil, some areas were originally forested. The darker color of the Shelby loam distinguishes it from the related Gara loam, also derived from till.

Soil Profile. The surface soil is a dark brown heavy loam, grading into a heavier brown loam at a depth of ten to twelve inches. The subsoil is a yellowish brown, stiff but plastic clay loam or sandy clay loam. It usually is mottled with gray and brown. Lime concretions may occur at a depth of forty to fifty inches.

Variations. The Shelby loam is most variable in color and depth of surface soil, sand content, and density of subsoil. The surface soil may be absent on eroded slopes, but accumulated to depths of fifteen or more inches at the base of slopes. A black surface soil is generally associated with a calcareous subsoil. Where the Shelby loam borders the Grundy silt loam, the subsoil is yellowish gray, plastic clay, less permeable than the subsoil on slopes. All of these variations are reasons for differences in the productivity of the soil.

Adaptation and Management. When uneroded the Shelby loam is a productive soil, but generally somewhat inferior to the other prairie types. Corn and grass are the major crops. Small grains are not extensively grown. Yields vary widely. Most of the land on slopes greater than eight to ten percent, is used for pasture. Where it has not been eroded the bluegrass pastures are good. The soil erodes easily, limiting the use of the land. The short irregular slopes are not suited for contour cropping or terracing. Fields are often divided by gullies that can not be crossed with farm implements.

SNEAD SILTY CLAY

The Snead silty clay (6-15 percent slopes) is a young soil formed from decomposed shale and limestone. It occurs in small areas in association with Lacona and Sampsel and other residual types, in the hilly land bordering the Grand river valley. The original vegetation was mixed forest including elm and walnut. The distinct dark color of the soil is due to the presence of lime that favored the accumulation of organic matter.

Soil Profile. The surface soil is a black silty clay, that grades into yellowish brown or olive colored plastic clay. Partially weathered shale or limestone generally occurs at depth of twenty-four to thirty inches. The soil material in calcareous.

Adaptation and Management. The natural fertility of the soil is very high. It is not well suited to cultivation becasue of the steep slopes and shallow depth. Erosion is severe. Grasses and clovers thrive remarkably well, and pasture is the main use of the land.

SNEAD STONY SILTY CLAY

The Snead stony silty clay (8-20 percent slopes) is a stony variation of the silty clay type. The dark surface soil contains limestone fragments, and is underlain by shale and limestone ledges. The soil mantle of three to twelve inches in thickness is sufficient for trees and shrubs. Where limestone predominates the color of the soil is black. The stony silty clay is non-arable. It has value for pasture and woodlots only.

TERRACE OR SECOND BOTTOM

BLOCKTON SILT LOAM,

Blockton silt loam is a deep, dark soil that occurs on terrace-like areas in the larger stream valleys. It is darker in color than Burrell and other terrace types. The surface is nearly level and is above overflow.

Soil Profile. The surface soil is a very dark brown mellow silt loam, grading at twelve to fifteen inches into a friable dark gray material. The subsoil below eighteen to twenty inches is a dark gray, plastic, silty clay. The lower subsoil may be mottled yellow and brown. There have been additions to the surface soil by wash from the adjacent upland in some places.

Adaptation and Management. The fertility of the Blockton silt loam is high, and is comparable to the better Grundy soil. It is superior for bluegrass, altho most of the land is used for corn. Clover thrives on this soil. Erosion is very slight.

BURRELL SILT LOAM

Burrell is a light colored soil, sometimes referred to as "crayfish land." It occurs on nearly level terraces, that rarely overflow.

Soil Profile. The surface soil is a friable silt loam six to eight inches in thickness, that changes to a light gray brittle silt loam, also about eight inches in depth. The subsoil is a dark gray plastic clay, mottled with yellow and brown, the mottling increases with depth.

Adaptation and Management. The fertility of the Burrell silt loam is low. The surface soil has poor structure, and the clay subsoil has low permeability. Pasture and meadow represent the best use of the land. Soybeans do well, and in favorable seasons good yields of corn are obtained.

EDINA SOIL LOAM, TERRACE PHASE

Edina silt loam, (terrace phase, 0-3 percent slopes), is a moderately dark colored "claypan" soil developed under prairie vegetation from alluvium or loess covered alluvium. It occurs on nearly level terraces that have the same elevation as the terraces on which Blockton and Burrell soil occur.

Soil Profile. The surface soil is a dark gray to very dark gray friable silt loam of approximately twelve inches in depth. The subsurface layer consists of approximately four inches of gray friable silt loam. The subsoil is a dark gray, very plastic clay that becomes mottled with yellow and brown with increasing depth.

Variations. The properties of this soil place it between the dark colored Blockton and the light colored Burrell soils. In places the depth and color of the surface soil have been slightly modified by recent local alluvium from the upland.

Adaptation and Management. The natural fertility level of the Edina silt loam, terrace phase, is medium. The organic matter content, as indicated by the color, is higher than that of the Burrell soils, but not as high as occurs in Blockton soils.

Overflow from the main streams is no problem. As with the other terrace soils, however, water from adjacent uplands damages crops in places.

Edina silt loam, terrace phase, is suited to general crop production and pasture. It does not encourage deep rooting of crops such as alfalfa because of the heavy infertile subsoil, very slow internal drainage, and associated poor aeration. The natural drainage is slow, but detrimental effects are reduced by use of surface ditches.

SANDY TERRACE SOILS

Within the floodplain of the Grand river there are several mounds or ridges of loose sand, about six to ten feet higher than the surrounding bottomland. They are remnants of old river deposits, probably formed during glacial times. The surface of the sandy areas is uneven.

The surface soil is a dark brown sandy loam, underlain by sand, or more frequently by stratified layers of sand and yellow brown plastic clay. The subsoil therefore may vary from a sandy clay loam to a fine sand. The sandy soil is fertile, the moisture capacity is low. It overflows during high floods. The land is used for corn and soybeans.

GRUNDY SILT LOAM, TERRACE PHASE

This is deep, dark soil, similar to the normal Grundy on the higher prairie upland. It occurs on level terraces located fifteen to twenty feet above the adjacent bottomland. Most of the type occurs in the old valley of Muddy creek. Occasionally the terrace grades gently into the upland type.

This is a very productive soil, largely used for corn and grasses.

BOTTOMLAND

NODAWAY SILT LOAM

Nodaway silt loam is the most extensive bottomland type of the county. It occurs in the broad valley of the Grand river and along all of the smaller streams. It is formed from recent alluvium and continues to receive fresh sediment. The soil does not have a distinct profile, and differences in depth are generally due to successive deposits.

Soil Profile. The characteristic features of the Nodaway silt loam are the dark brown or gray brown color that may extend to a depth of three or more feet. Recent sediments may have a gray appearance but become dark in time. In general, the soil is darker in the small valleys than in the Grand river bottom. Also, it is lighter in color near the stream channels than elsewhere. The texture, too, varies, and may range from a fine sandy loam to a heavy loam. The coarser texture generally occurs near the streams. Included in the Nodaway silt loam are the low alluvial fans that sometimes form where small streams enter the larger valley.

Adaptation and Management. Practically all of the Nodaway silt loam along the Grand river and its larger tributaries, is subject to flooding. This condition, and the high fertility of the soil, determine the use of the land. Corn is the main crop. The deep, open soil, retentive of moisture, is especially well suited for this crop. Soybeans are extensively grown, especially in years when floods delay planting. Much of the Nodaway silt loam that does not flood is used for pasture, but here, too, corn is the major crop. The soil will remain productive indefinitely because of its great depth and because it is continually receiving fresh soil material. The hazard of floods have been reduced in some sections by straightening stream channels and by building levees.

WABASH SOILS

The dark or black bottomland soils have been classified in the Wabash series. Because of difference in texture of the surface soil, there are three types:

Wabash Silt Loam
Wabash Silty Clay Loam
Wabash Clay

These soils differ from the associated Nodaway silt loam in the darker color throughout the profile, and the higher clay content in the subsoil.

Wabash Silt Loam

This is a very dark brown or black granular silt loam that grades into a dark gray silty clay at depths of twelve to eighteen inches. Occasionally the dark color extends to a depth of three or more feet. Areas that have received recent sediment may have a dark gray color at the surface. The transition from Wabash silt loam to other alluvial types is gradual and indefinite.

Adaptation and Management. This is the most productive soil in the county. Most of it is subject to overflow, which fact limits the use of the land. Corn, wheat and soybeans are the main crops. They give high yields. Surface drainage is usually good or can be provided by open ditches.

Wabash Silty Clay Loam

Wabash silty clay loam, generally in association with Wabash clay, occurs only in the broad river bottom. It is black at the surface and grades into a dark gray clay. Its properties delay spring

planting in wet spring season. In dry seasons the soil shrinks and cracks with resulting injury to crops.

Wabash Clay

Wabash clay, generally known as "gumbo", occupies large uniform areas in the river bottoms. The dark surface soil grades into a dark gray, very plastic clay subsoil. The latter may be blue gray, with brown stains, below thirty inches. More frequently the dark color extends to a depth of several feet. The immediate surface soil is friable, but cultivation is rarely deeper than six inches. When dry, the soil shrinks and cracks to great depth.

Adaption and Management. The original vegetation was swamp grass. Crop production now is uncertain. In some years much of the land is idle because of floods or wet weather. Even if flooding could be prevented, crop production would be uncertain. Crops can not always be planted or cultivated at the proper time. Dry weather may be as much of a hazard as wet seasons.

Corn is not well adapted to this heavy soil. Soybeans and wheat are grown more successfully. Land that has been flooded in spring is generally planted to soybeans. Tile drainage is not feasible. Open surface ditches are effective. Even with flood protection and improved drainage, crop production on the Wabash clay will always be uncertain and difficult.

TABLE 2--SUMMARY OF SOIL FEATURES AND PROPERTIES

Map Symbol	Soil Type	Slope Range Percent	Color Surface Soil	Color Subsoil	Texture of Subsoil	Internal Drainage	Parent Material	Native Vegetation	Erosion Hazard
	Upland Soils								
Ea	Edina silt loam	0-2	Dark gray	Very dark gray	Clay	Very slow	Loess	Prairie	Slight
Ga	Gara loam	3-8	Grayish brown	Yellowish brown	Clay loam	Moderate	Glacial till	Forest-Prairie	Severe
Gc	Gara loam	9-18	Grayish brown	Yellowish brown	Clay loam	Moderate	Glacial till	Forest-Prairie transition	Very severe
Gd	Gosport silt loam	8-20	Pale brown	Yellowish brown	Partly weathered silty shale	Good	Silty shales	Forest	Severe
Ge	Grundy silt loam	1-4	Very dark brown	Very dark gray	Silty clay	Slow	Loess	Prairie	Moderate
Ka	Keytesville silt loam	3-7	Grayish brown	Grayish brown	Silty clay	Very slow	Shale, loess, and glacial till	Forest	Moderate
La	Lacona silt loam	2-8	Dark brown	Brown	Silty clay	Good	Silty shale and limestone	Prairie	Moderate
Lc	Lacona silt loam	9-15	Dark brown	Brown	Silty clay	Good	Silty shale and limestone	Prairie	Severe
Ld	Lagonda silt loam	2-8	Dark grayish brown	Very dark gray	Clay loam	Slow	Loess and till	Prairie	Moderate to Severe
Ma	Mandeville silt loam	2-5	Grayish brown	Yellowish brown	Silty clay	Good	Silty shale	Forest	Moderate
Mb	Mandeville silt loam	6-10	Grayish brown	Yellowish brown	Silty clay	Good	Silty Shale	Forest	Severe
Sa	Seymour silt loam	1-4	Very dark grayish brown	Dark gray	Clay	Slow	Loess	Prairie	Moderate
Sb	Shelby loam	4-8	Very dark brown	Dark yellowish brown	Clay loam	Moderate	Glacial till	Prairie	Severe

Sd	Shelby loam	9-15	Very dark brown	Dark yellowish brown	Clay loam	Moderate	Glacial till	Prairie	Very severe
Sf	Snead silty clay	6-15	Black	Dark gray	Partly weathered shale	Moderate	Shale and limestone	Forest-Prairie transition	Severe
Sg	Snead stony silty clay	8-20	Black	---	Stony	---	Shale and limestone	Forest	Moderate
Sh	Sampsel silt loam	5-15	Very dark brown	Very dark gray	Clay	Slow	Shale and limestone	Prairie & Forest	Moderate to severe
	Terraces or Second Bottoms								
Ba	Blockton silt loam	0-4	Very dark brown	Very dark gray	Silty clay	Slow	Alluvium or loess over alluvium		Slight
Ca	Burrell silt loam	0-3	Gray	Dark gray	Clay	Very slow	Alluvium or loess over alluvium		Slight
Cb	Edina silt loam, terrace phase	0-3	Dark gray	Very dark gray	Clay	Very slow	Alluvium or loess over alluvium		Slight
Cc	Sandy terrace soils		Dark brown	Dark yellowish brown	Clay loam and sand	Good	Sandy alluvium		Slight
Gf	Grundy silt loam, terrace phase	0-4	Very dark brown	Very dark gray	Silty clay	Slow	Alluvium or loess over alluvium		Slight
	Bottomland Soils								
Na	Nodaway silt loam		Dark grayish brown	Grayish brown	Silt loam or fine sandy loam	Good	Recent alluvium		None
Wa	Wabash silt loam		Black	Very dark gray	Silty clay	Good	Alluvium		None
Wb	Wabash silty clay loam		Black	Very dark gray	Clay	Slow	Alluvium		None
Wc	Wabash clay		Black	Very dark gray	Clay	Slow	Alluvium		None

Agricultural Development

The type of farming, similar to that of most of Northwestern Missouri, is well diversified, including along with the production of grain and forage, the raising of livestock -- cattle and hogs. Approximately fifty percent of all the land is in cultivation. Corn, oats, wheat, soybeans, and clovers are the principal crops. The area in corn is equal to that of all the other crops combined. The prairie and river bottom soils have the highest percent of cultivated land.

Approximately forty percent of all the land is in pasture including woodland pasture. This large area is so used because of topography, erosion and suitability of the soil for bluegrass and other agricultural grasses. The highest percents of pasture land are on Shelby and Gara soil types.

Cattle and hogs, kept on almost every farm, are the main source of income. Those raised on the farms, and those brought in to be fed, are maintained on the pastures. Most of the corn is marketed thru livestock.

There has not been a significant change in crop acreage or land use for many years. The acreage in soybeans has increased in recent years to about seven thousand, and may have further increases, particularly on the river bottom land. The areas in oats and wheat vary from year to year, due largely to weather conditions at seeding time.

The stability in the type of farming is resulting in the maintenance and improvement of the soils. Limestone is now generally used. Clover is grown mainly as a hay crop. Fertilizers is used on both corn and small grain. The need for lime and fertilizer is most apparent on those soils that have been modified by erosion. Even if the possibilities for improving pastureland are as favorable as for improving cultivated land very little has been done. There are many permanent pastures characterized by poor stand and inferior quality of grass. Both lime and other fertilizers are generally needed, and are most effective when applied at the time of making a new seeding. The different soils vary in their capacity to respond to fertilizer treatment, but all can be made to produce larger yields than are now obtained.

1950 CENSUS DATA FOR DAVIESS COUNTY

Total land area	360,320	acres
Land in farms	336,231	acres
Porportion land in farms	93.3	percent
Number of farms	2,108	
Average size of farms	159.5	acres
Proportion farms operated by tenants	22	percent
Land Use		
Total crop-land	152,902	acres
Total pasture-land	150,787	acres
Total woodland	35,951	acres
Woodland pastured	28,831	acres
Cropland		
Corn	56,676	acres
Oats	25,198	acres
Wheat	21,855	acres
Soybeans	7,300	acres
Alfalfa	4,481	acres
Clover & Timothy	15,867	acres
Lespedeza	19,824	acres
Bluegrass, harvested for seed	1,740	acres

CROP YIELDS

An Index of Soil Productivity

Table 3 gives an estimate of the average crop yields on the different soil types under two levels of management -- ordinary and good. Ordinary management may be defined as the system which does not include the extensive use of lime and other fertilizers, or provide for erosion control and a good cropping system. Good management - as considered in the table - is that which includes other practices as will improve the productivity of the soil.

The estimated yields are not to be taken as actual, but as an index of the comparative productivity of the soils, and their capability for increased production. The yields given represent what can be expected over a long period of years, on a farm field basis, in favorable seasons. They can be exceeded when good practices are applied regularly. As new crop varieties, new cultural and fertilizer practices, are discovered and are more universally applied on farms, the estimates may need revision. In general, the deep well drained soils with good structure and much organic matter, are the most responsive.

Fertilizer and Limestone Used in Daviess County in 1952

All fertilizers . . . . . 5502 tons
Approximately one-third of all fertilizer is rock phosphate
Limestone. . . . . 30,000 tons

TABLE 3 -- ESTIMATED AVERAGE CROP YIELDS PER ACRE ON UNERODED OR SLIGHTLY ERODED SOILS* UNDER (A), ORDINARY MANAGEMENT AND (B), GOOD MANAGEMENT

Map Symbol	Soil Type	Corn (bu.)		Wheat (bu.)		Oats (bu.)		Soybeans (bu.)		Clover tons		Lespedeza tons		Pasture lbs. beef	
		A	B	A	B	AB	B	A	B	A	B	A	B	A	B
Ba	Blockton silt loam	50	80	20	30	35	60	22	32	2.0	3.0	1.5	1.5	175	275
Ca	Burrell silt loam	25	40	10	18	20	35	11	20	0.3	1.5	1.0	1.5	80	175
Cb	Edina silt loam, terrace phase	35	60	15	28	25	40	16	26	0.5	2.0	1.0	1.5	150	250
Cc	Sandy terrace soils	45	60	20	25	30	40	25	30	2.0	3.0	1.0	1.5	---	---
Ea	Edina silt loam	30	60	15	28	25	40	16	26	0.5	2.0	1.0	1.5	150	250
Ga&Gc	Gara loam	30	50	12	25	25	40	--	--	1.0	2.0	1.0	1.5	130	200
Gd	Gosport silt loam	15	30	8	15	15	25	--	--	---	---	0.8	1.0	70	150
Ge	Grundy silt loam	50	80	20	30	40	55	20	30	2.0	3.0	1.5	1.5	175	275
Gf	Grundy silt loam, terrace phase	50	80	20	30	40	55	20	30	2.0	3.0	1.5	1.5	175	275
Ka	Keytesville silt loam	20	40	10	20	20	35	10	20	0.3	1.5	0.8	1.2	80	175
La&Lc	Lacona silt loam	43	60	20	25	35	50	18	28	1.0	3.0	1.3	1.5	175	275
Ld	Lagonda silt loam	38	65	18	27	30	45	18	28	1.8	2.5	1.0	1.5	175	275
Ma&Mb	Mandeville silt loam	25	45	10	20	20	40	--	--	0.5	2.0	0.8	1.3	100	200
Na	Nodaway silt loam	45	75	25	30	40	55	25	30	2.5	3.0	1.5	1.5	200	275
Sh	Sampsel silt loam	43	70	20	30	30	50	20	27	2.0	3.0	1.5	1.5	175	275
Sa	Seymour silt loam	45	75	20	30	35	55	20	29	2.0	3.0	1.5	1.5	175	275
Sb&Sd	Shelby loam	40	70	19	27	35	50	16	25	2.0	3.0	1.5	1.5	175	275
Sf	Snead silty clay	30	40	20	25	35	40	18	28	1.8	2.0	1.5	1.5	175	250
Sg	Snead stony silty clay	--	--	--	--	--	--	--	--	---	---	---	---	70	100
Wa	Wabash silt loam	55	80	25	30	40	55	30	35	2.0	3.0	1.5	1.5	200	275
Wb	Wabash silty clay loam	50	65	25	30	40	55	22	28	2.0	2.5	1.5	1.5	175	250
Wc	Wabash clay	35	45	20	25	30	40	20	26	1.0	2.0	1.0	1.5	100	200

*Yields may be much lower on eroded soils, especially if the subsoil is heavy textured or otherwise unfavorable.

SOIL EROSION

Erosion is the most important force in soil deterioration in Daviess county. It occurs on all the upland soils, but is most apparent on the Shelby and Grundy types. It is generally more severe on the steeper slopes, but varies mainly according to properties of the soil. Excessive cultivation favors erosion, but much of the damaged land is not now used for crop production.

A few erosion control practices have been adopted, but much more remains to be done. Terracing contour cultivation and diversion ditches might well be applied. Adjusting field boundaries to slopes and changes in the succession of crops are other divices which may be used. Improving the fertility of the soil to secure denser cover is desirable, especially on pastures. All of these practices should result in reduced runoff.

TABLE 4 -- PROPORTION OF TOTAL LAND AREA IN VARIOUS SLOPES GROUPS

Slope Group	Percent of Total Area
0-2% slopes, nearly level	21.0
2-5% slopes, gently sloping	22.6
5-8% slopes, moderately sloping	25.0
8-15% slopes, strongly sloping or rolling	23.6
15-25% slopes, Moderately steep or hilly	6.5
Greater than 25% slopes, steep	1.3

FLOOD CONTROL

Floods are of great significance in Daviess county. They are of almost annual occurance in the Grand river, Big creek and other large stream valleys. They occur at anytime of the year, but are most frequent in spring. Floods in the smaller valleys are of short duration, but in the Grand river they may continue for many days. Buildings, fences, and facilities for storing crops are therefore not placed in the bottomland.

Sections of the channel of the Grand and the other large streams have been straightened. This has hastened runoff, and tended to reduce the height and length of floods. The new channel has a larger capacity than the old channel. The low gradient of the stream can not be increased, and therefore the channel tends to widen but not deepen. A large flood control reservoir on the Grand river has been proposed. It would include much of the valley between Gallatin and Pattonsburg. Control by levees does not seem feasible, because of the height of floods, and the drainage problem that would result.

WATER SUPPLY

Water for domestic use on farms is obtained from wells and cistern. Most of the wells are relatively shallow -- less than 100 feet. There are very few springs, and these are of small flow. Perrenial streams are usually turbid for most of the year. Many farms have one or more ponds to supply water for livestock.

VIRGIN VEGETATION

It is estimated that originally approximately two-thirds of Daviess county had prairie vegetation. Practically all of the gently rolling upland was covered by large Bluestem and other prairie grasses. The large areas of clay soils in the Grand river floodplain, covered with swamp grass, were known as "prairie bottom." The rolling and hilly land bordering the streams was forested. The forest included a great variety of species -- oak on the ridges, and elm, hackberry, ash, maple and walnut on the slopes and valleys. The prairie border was characterized by sumac, hazel, haw,

and other shrubs. Most of the small areas for forestland now remaining are used as pasture also. The establishment and maintenance of permanent woodlots, is highly desirable for supplying lumber and posts, and as an aid in soil erosion control. The most favorable forest sites occur on Gara, Gosport, and Shelby soils.

CLIMATE

The climate of Daviess county is temperate and continental. The winters are short and moderate, with short periods of zero weather. The summers are often hot, but temperatures higher than 90° are rare. The mean seasonal temperature in winter is 27.9°; spring, 51.9°; summer, 74.6°; and fall, 52.3°.

The average date of the last killing frost in the spring is April 20, and that of the first in the fall, October 17. The latest frost recorded in the spring occurred on May 11, and the earliest in the fall on September 29, giving a growing season of 180 days.

The mean annual precipitation is 37.38 inches, the maxium 63.90 inches (1898) and the minimum 23.23 inches (1906). The rainfall is well distributed throughout the year and usually plentiful for crop growth. About 86 percent of the rainfall occurs in the spring, summer, and fall. The lightest rainfall occurs during the winter months with only 14 percent of the total yearly rainfall. Sometimes crops suffer from dry weather especially on the more eroded and shallow soils that have a low waterholding capacity. Crops are occasionally injured by wet weather, especially on the more poorly drained bottomland soil and the relatively level land north of Jamesport.

The moderately humid climate has affected the processes of soil development. The lime has been leached from the soil to a depth of four or more feet. An accumulation of clay in the subsoil characterizes the profile of all soils on the upland. The soils are not as highly weathered, however, as characterizes older soils in regions of higher rainfall. The climate has been favorable also for a prairie type of vegetation that prevailed on most of the upland.

TABLE 5 -- NORMAL MONTHLY, SEASONAL, AND ANNUAL TEMPERATURE AND PRECIPATION AT KIDDER, CALDWELL COUNTY, MISSOURI
(Elevation 1,020 Feet)

	Temperature			Precipitation			
Month	Mean	Absolute Maximum	Absolute Minimum	Mean	Total for Driest Year (1906)	Total for Wettist Year (1898)	Average Snowfall
	F	F	F	Inches	Inches	Inches	Inches
December	29.2	72	-21	1.27	1.23	2.64	4.2
January	26.0	69	-27	1.22	1.46	4.73	5.1
February	28.4	80	-28	1.54	2.36	1.50	5.6
Winter	27.9	80	-28	4.03	5.05	8.87	14.9
March	40.8	89	- 4	2.19	1.85	5.10	3.5
April	52.2	93	6	3.28	2.44	3.89	1.4
May	62.6	97	22	4.65	1.37	11.17	.0
Spring	51.9	97	- 4	10.12	5.66	20.16	4.9
June	71.8	103	42	4.97	2.09	10.58	.0
July	76.8	109	46	3.88	2.25	4.91	.0
August	75.4	111	42	3.96	2.74	5.26	.0
Summer	74.6	111	42	12.81	7.08	21.25	.0
September	67.3	103	26	5.20	2.28	7.30	.0
October	55.8	94	8	3.07	0.42	5.04	0.4
November	41.8	82	- 3	2.15	2.72	1.78	1.5
Fall	54.9	103	- 3	10.42	5.44	14.12	1.9
YEAR	52.3	111	-28	37.38	23.33	63.90	21.7

GEOGRAPHICAL AND HISTORICAL FEATURES

Daviess county is located in the center of the northwestern quarter of Missouri. It is fifty-eight miles east of St. Joseph, and seventy-eight miles northeast of Kansas City.

The topography is dominantly gently rolling, and less than ten percent of the county is hilly. The most extensive area of level land is in the northeastern part of the county. Most of the hilly land is on the west side of the Grand river bottom. Land that has a slope of fifteen or more percent, comprises less than eight percent of the county area. Approximately twenty-five percent of all land is bottomland.

The most distinct physiographic feature is the Grand river valley that bisects the county. The width of the valley varies from one-forth to two miles. The low, broad valley along Muddy Creek is considered to bewithin an old valley that existed before glacial time. Both the Grand river and Muddy creed have a low gradient, and long sections of the channels have been straightened to accelerate the flow of water. Floods on the bottomland are of frequent occurance. The general elevation of the upland is approximately nine hundred feet above sea level.

The first settlement by white man in Daviess county occurred in 1830. Most of the early settlers came from Kentucky, Tennessee and the Carolinas.

Daviess county was established by an act of Missouri General Assembly on Nov. 29, 1836, and the county seat, Gallatin, was founded in 1837. In 1841, a group of Mormons, under the leadership of Joseph Smith, settled near the present village of Jameson, but were eventually forced to move because of opposition by the earlier residents of the area.

The U. S. Census for 1900 reports the county population as 21,325. This steadily declined and the population in 1950 was 13,398. Gallatin has a population of 1,634. The rural population is evenly distributed in the county, and is approximately twenty per square mile.

REVIEW OF ANALYTICAL DATA

Quantitative measurements of the chemical and physical properties of a soil profile are an aid in interpreting and comparing soils more precisely. Table 6 gives the analysis of four extensive soil types. The samples were taken in adjoining counties, but are representative of soil conditions in Daviess county.

The table shows that the mechanical compositions of Edina, Grundy and Seymour soils are very similar. These loess-derived soils contain very little sand, but have a high content of silt and clay. This is in contrast to the till-derived Shelby loam, which has a relatively high content of sand. The clay contents in the upper subsoils of the Edina, Seymour and Grundy -- 57, 55 and 44 percent respectively -- are in accord with field observations, and are the distinguishing features of these three types. The concentration of clay in the subsoil of the Shelby is not pronounced.

The content of organic matter is relatively low in all the soils, but it extends to great depth as is characteristic for prairie soils.

All of the soils are acid thruout the profile. This indicates that the soil materials are highly weathered.

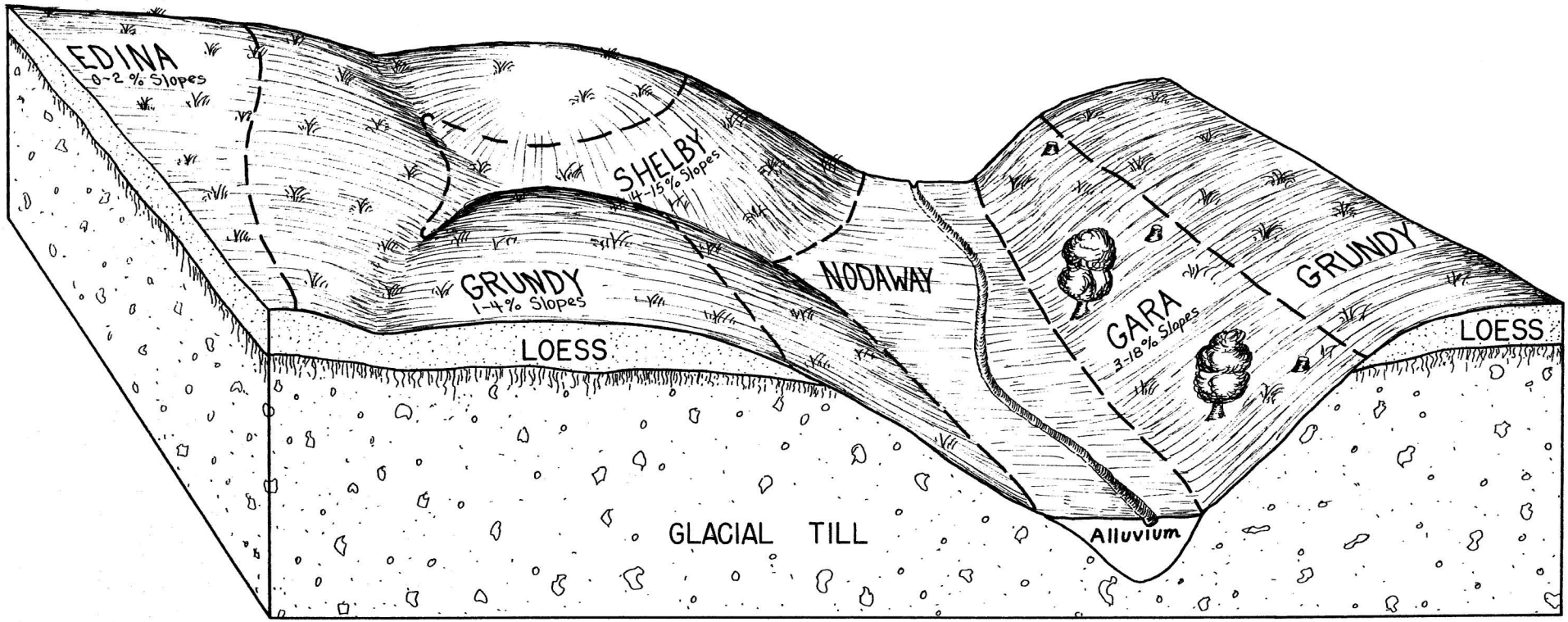
The exchange capacities or the ability to hold nutrients, are high, but is lowest in the Shelby loam.

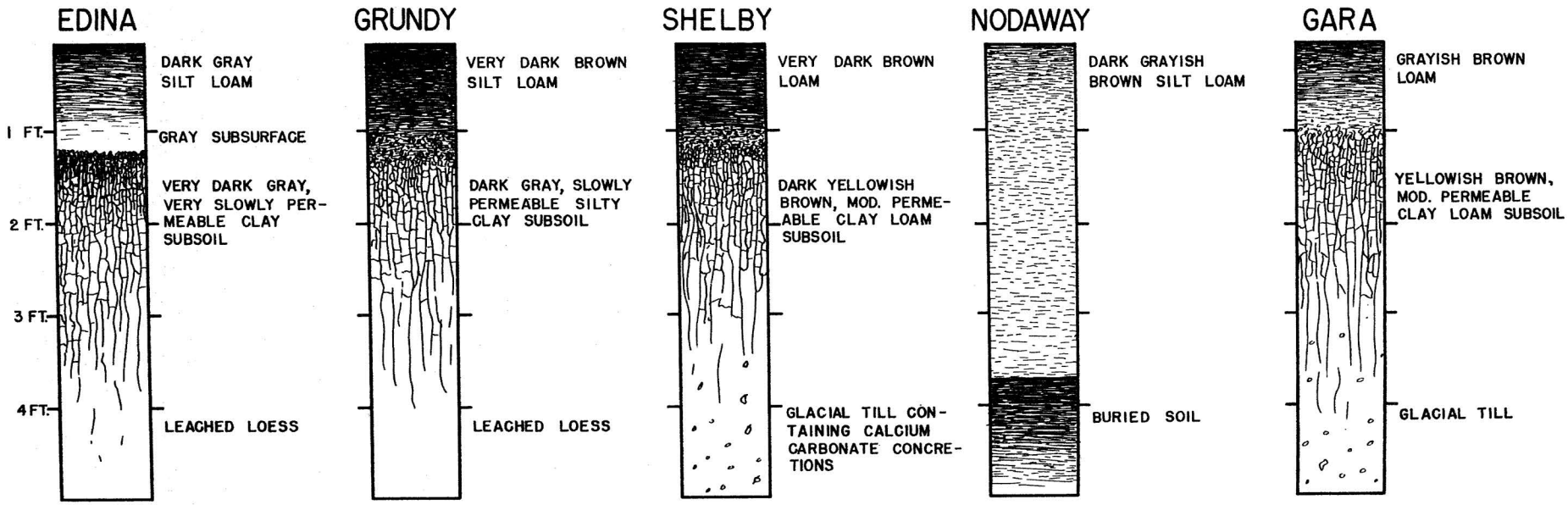
The phosphorus contents of all the soils are comparatively low. This fact establishes the need for, and explains the generally good returns obtained from the use of fertilizer containing phosphorus.

The potassium contents are generally adequate for fair yields. Potassium fertilizer should be used on soils well supplied with lime and other fertility than potassium. In assessing the crop value of a soil, all chemical and physical factors must be taken into consideration.

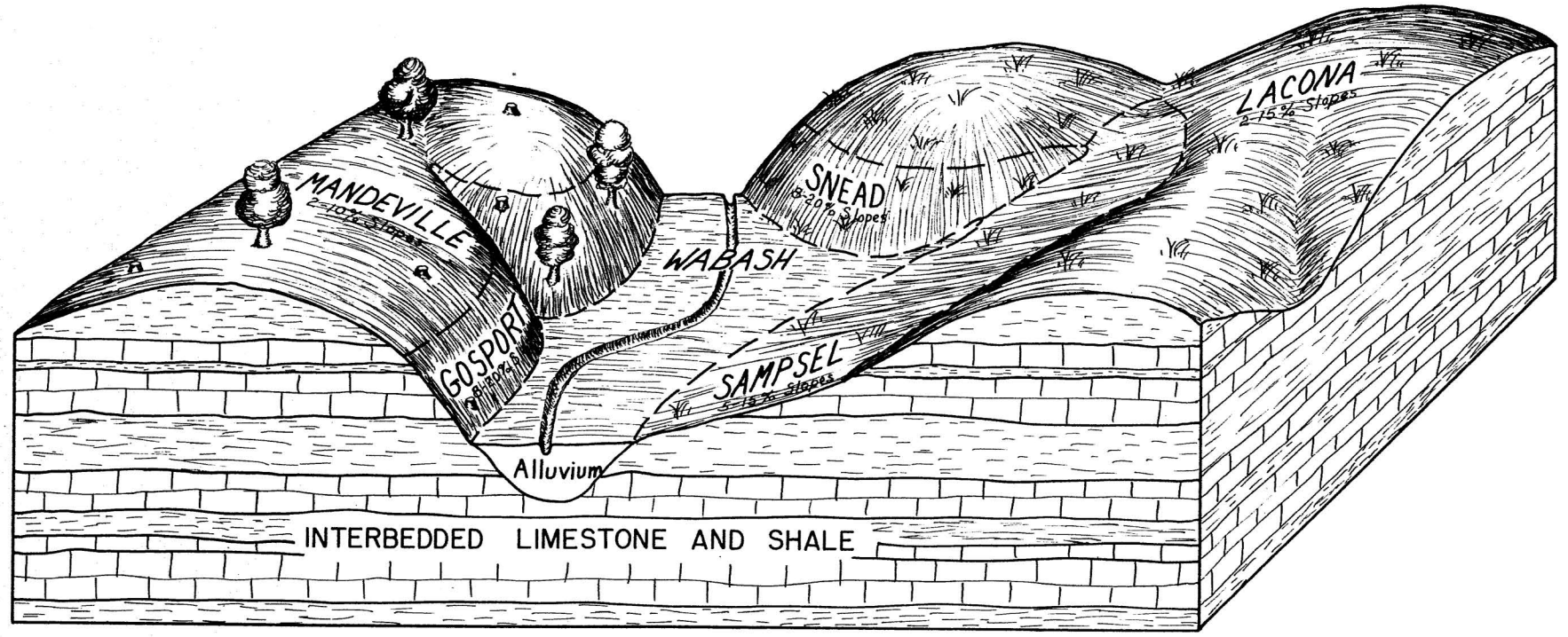
TABLE 6 -- MECHANICAL AND PARTIAL CHEMICAL ANALYSES OF FOUR SOILS SIMILAR TO THOSE IN DAVIESS COUNTY

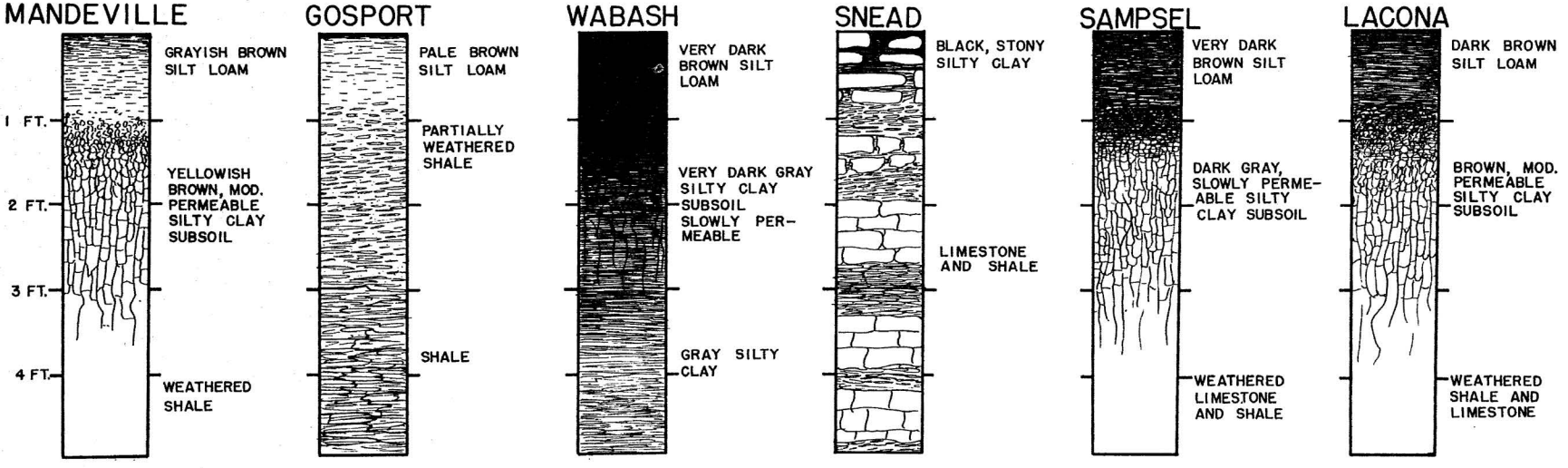
Soil Type	Depth Inches	Organic Matter Percent	Sand (0.05mm) Percent	Silt (0.05-0.002mm) Percent	Clay (0.002 mm) Percent	pH	Exchange Capacity M.E./100 gm.	Exchangeable Calcium M.E./100 gm.	Calcium Saturation Percent	Total Phosphorus lbs./Acre	Available Phosphorus lbs./Acre	Available Potassium lbs./Acre
Grundy silt loam	0-11	---	2.9	74.8	22.3	5.8	21.2	14.6	69	---	---	----
Location - Sec 3, T57N.,	11-18	---	4.2	66.8	29.0	5.8	23.0	12.2	53	---	---	----
R31W, DeKalb County	18-28	---	2.0	53.9	44.1	5.5	33.7	19.8	59	---	---	----
Depth of Loess - More than	28-40	---	1.8	56.1	42.1	6.5	31.0	19.9	65	---	---	----
61 inches	40-61	---	1.6	61.9	36.5	6.6	28.8	18.9	65	---	---	----
Sample by H. H. Krusekopf, 1944												
Analyses by E. O. McLean, 1945												
Seymour silt loam	0-8	2.8	6.3	69.0	24.7	6.3	16.3	16.9	100	720	150	204
Location - Sec 11, T57N,	8-11	3.2	7.1	63.6	29.3	5.4	16.1	12.6	79	880	76	196
R23W, Livingston County	11-15	2.4	4.9	65.7	29.4	5.2	15.7	11.9	79	680	56	256
Samples and Analyses by	15-19	2.1	4.3	58.2	37.5	5.2	21.3	16.4	77	700	78	280+
J. A. Frieze, W. D. Shrader,	19-24	2.0	3.4	41.3	55.3	5.0	32.3	19.6	60	900	34	280+
and J. D. Rourke, 1947	24-28	1.2	3.0	46.3	50.7	5.3	32.7	22.1	68	---	---	280+
	28-32	---	2.6	49.3	49.2	5.3	31.3	22.4	71	---	---	280+
	32-36	---	2.6	48.3	50.1	---	27.8	21.7	78	---	---	244
Edina silt loam	0-9	2.4	2.6	78.1	19.4	4.9	21.9	8.3	38	780	80	224
Location - Sec. 5, T57N,	9-13	1.0	2.3	80.3	17.4	5.7	21.4	6.5	31	---	48	----
R22W, Livingston County	13-16	0.8	1.7	75.0	23.3	6.0	22.0	7.7	35	400	34	136
Samples and Analyses by	16-20	2.1	2.0	42.2	54.8	5.2	----	----	--	680	24	280+
J. A. Frieze, W. D. Shrader,	20-28	2.0	1.6	42.0	57.4	5.1	----	----	--	520	27	----
and J. D. Rourke, 1947	28-36	0.5	3.5	51.9	44.6	6.4	24.4	15.3	63	---	---	----
	36-40	---	4.9	52.0	43.2	5.7	24.3	19.1	79	---	---	----
	40-60	---	2.4	57.4	40.2	5.2	----	----	--	1120	---	280+
Shelby loam	0-10	2.5	46.6	11.8	25.0	5.1	16.8	12.1	72	640	13	156
Location - Sec. 5, T57N,	10-16	1.6	43.9	11.0	30.9	4.8	17.7	12.1	68	520	14	176
R22W, Livingston County	16-24	1.0	41.9	11.9	33.8	4.6	17.3	14.3	83	400	14	256
Samples and Analyses by	24-36	---	39.5	13.5	34.0	5.1	19.2	15.4	80	400	18	232
J. A. Frieze, W. D. Shrader, and J. D. Rourke, 1947												



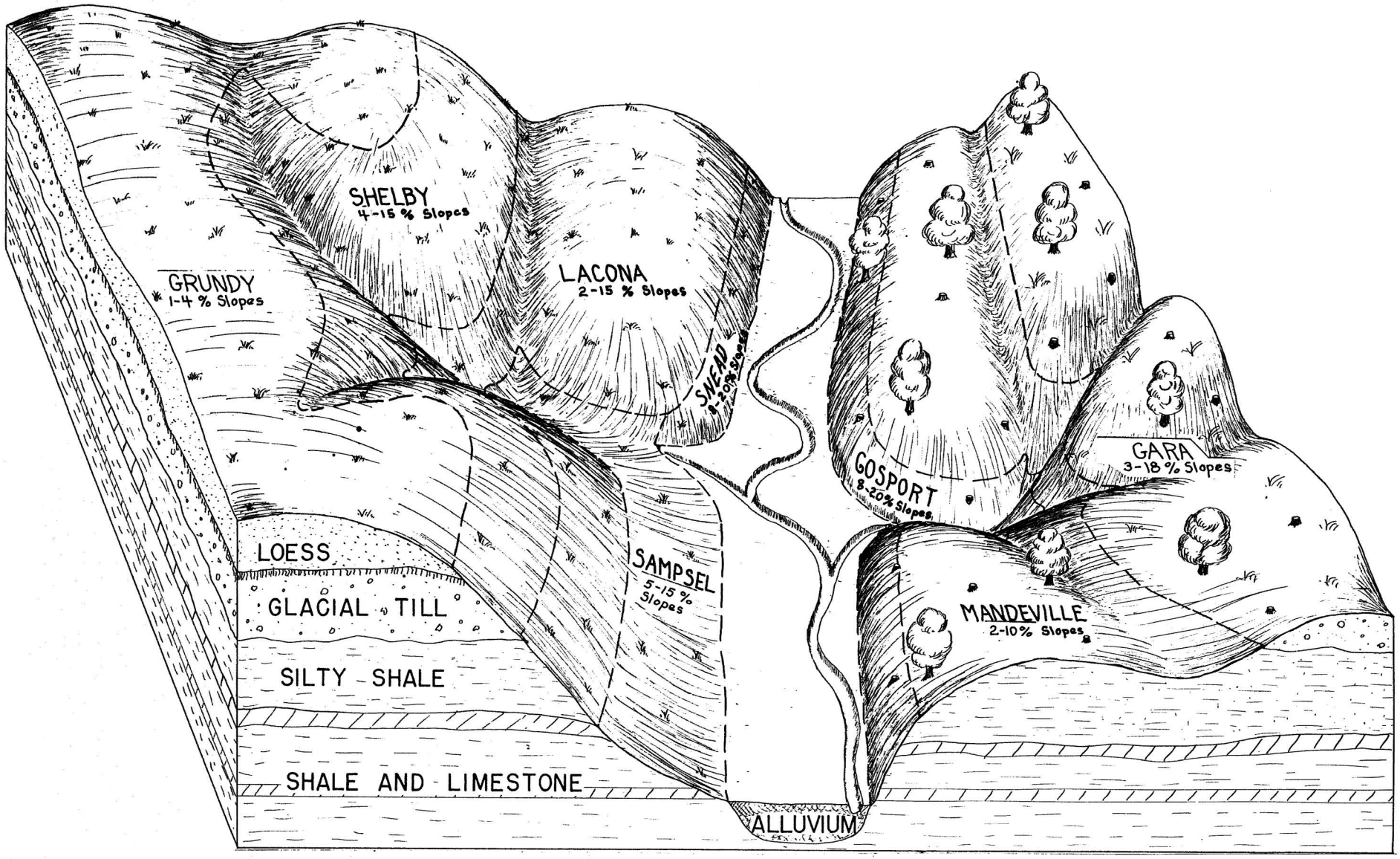


RELATIONSHIP OF SOME SOILS FROM LOESS AND TILL TO PARENT MATERIAL, TOPOGRAPHY AND NATIVE VEGETATION

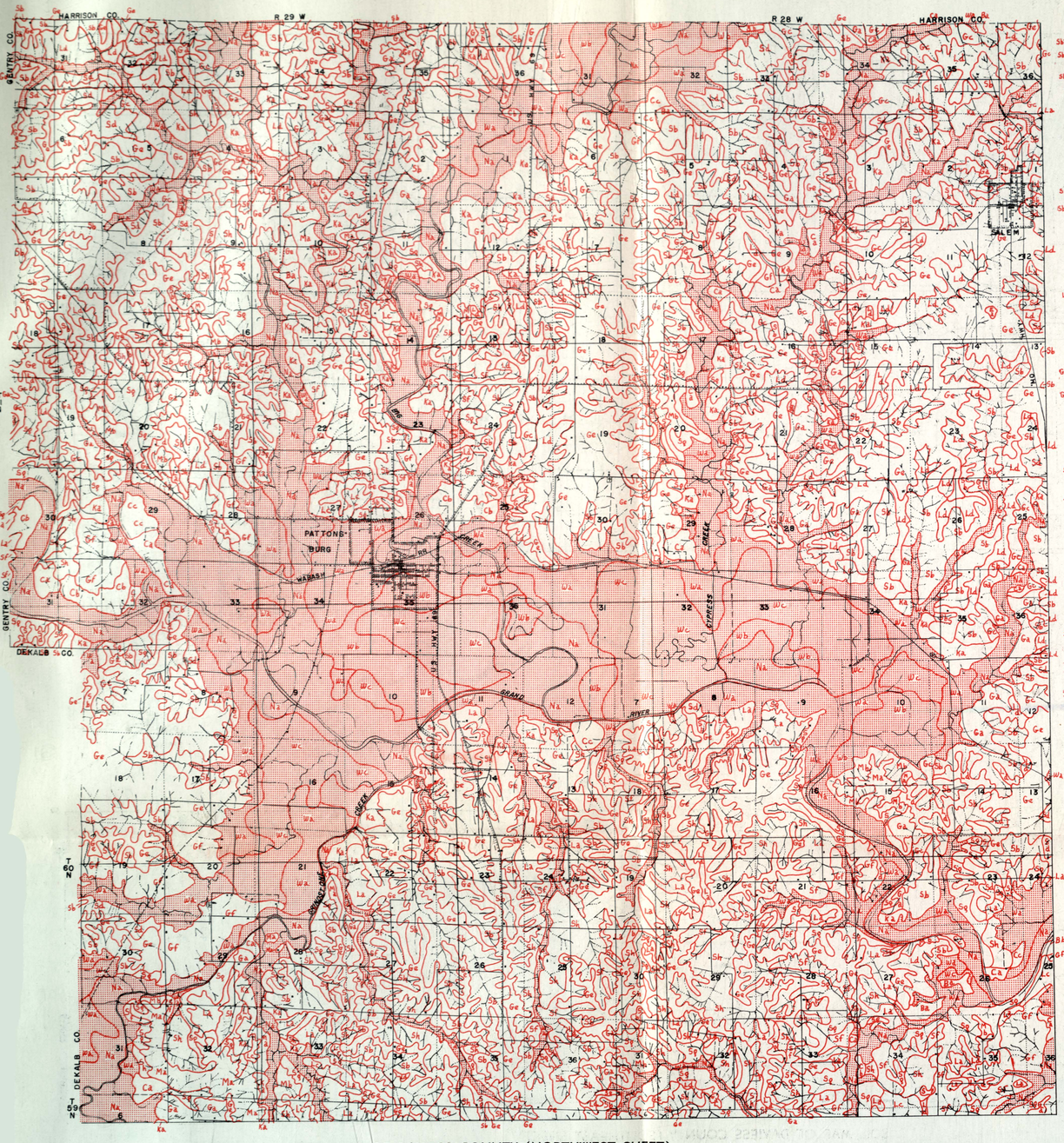




RELATIONSHIP OF SOME SOILS FROM RESIDUAL MATERIALS TO PARENT MATERIAL, TOPOGRAPHY AND NATIVE VEGETATION



RELATIONSHIP OF UPLAND SOIL SERIES TO
PARENT MATERIAL, TOPOGRAPHY AND NATIVE VEGETATION



SOIL MAP OF DAVIESS COUNTY (NORTHWEST SHEET)

SCALE 0 1/4 1/2 2 MILES

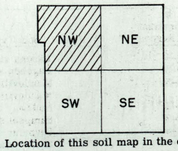
SOILS LEGEND

Upland | Bottomland

Symbol	Soil Type Name	Predominant Slope (Percent)
Ba	Blockton silt loam	0-4
Ca	Burrell silt loam	0-3
Cb	Edina silt loam, terrace phase	0-3
Cc	Sandy terrace soils	0-3
Ea	Edina silt loam	0-2
Ga	Gara loam	3-8
Gc	Gara loam	9-18
Gd	Gosport silt loam	8-20
Ge	Grundy silt loam	1-4
Gf	Grundy silt loam, terrace phase	0-4
Ka	Keytesville silt loam	3-7
La	Lacona silt loam	2-8
Lc	Lacona silt loam	9-15
Ld	Lagonda silt loam	2-8
Ma	Mandeville silt loam	2-5
Mb	Mandeville silt loam	6-10
Na	Nodaway silt loam	
Sh	Sampsel silt loam	5-15
Sa	Seymour silt loam	1-4
Sb	Shelby loam	4-8
Sd	Shelby loam	9-15
Sf	Snead silty clay	6-15
Sg	Snead stony silty clay	8-20
Wa	Wabash silt loam	
Wb	Wabash silty clay loam	
Wc	Wabash clay	

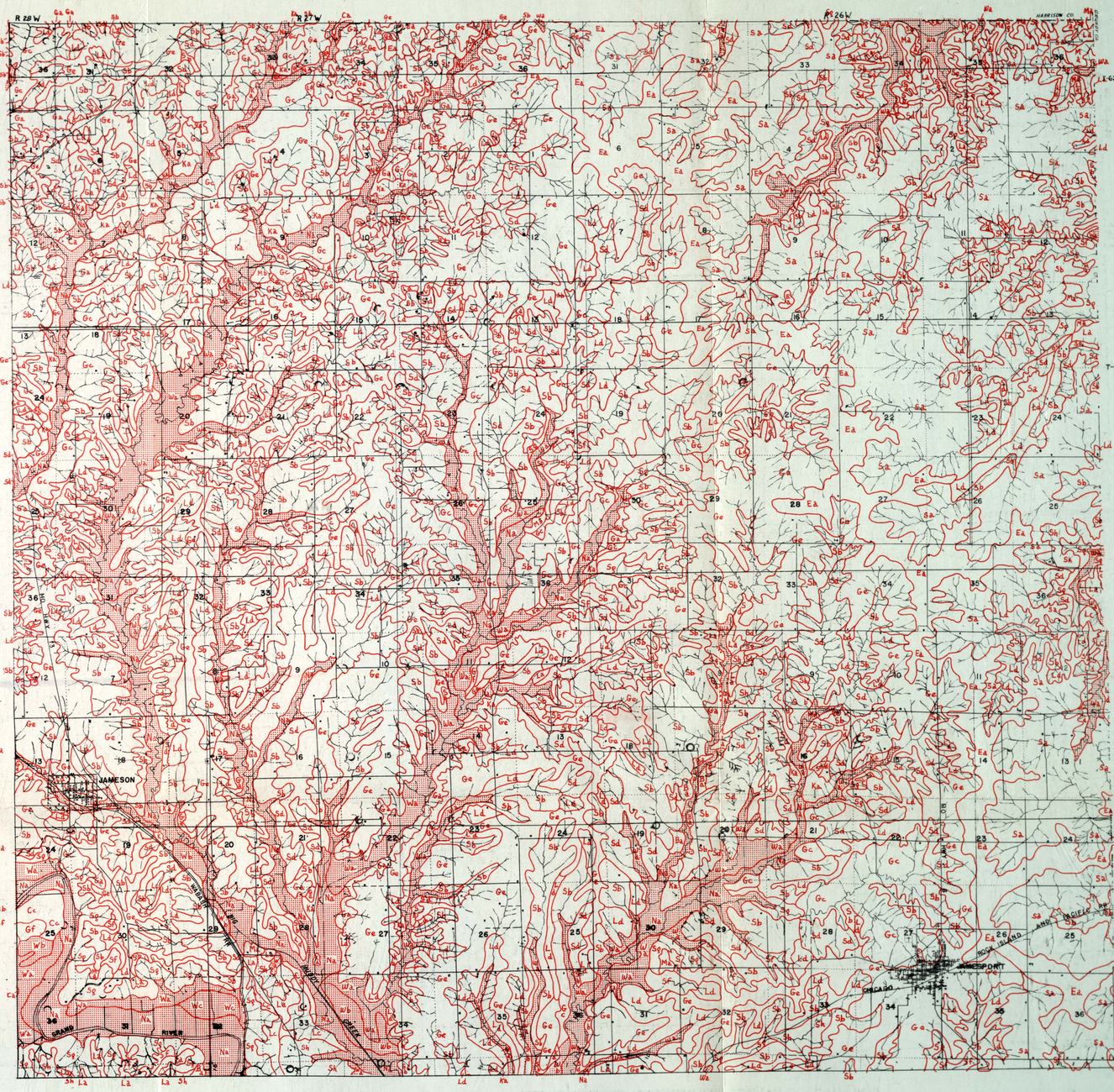
SIGNS AND SYMBOLS

- Soil boundary
- Good motor road
- Dirt or private road
- Railroad
- Pipeline
- Gully
- Intermittent stream
- Perennial stream (small)
- Perennial stream (large)
- House
- Church
- Schoolhouse
- Cemetery
- Rock outcrop
- Section line
- Line of latitude or longitude



Location of this soil map in the county

Prepared by Department of Soils, College of Agriculture, University of Missouri from a soil survey by Missouri Agricultural Experiment Station and Soil Conservation Service, United States Department of Agriculture, cooperating.



SOIL MAP OF DAVIESS COUNTY (NORTHEAST SHEET)

SCALE 0 1/4 1/2 2 MILES

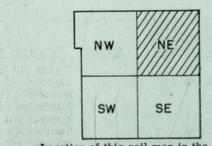
SOILS LEGEND

Upland | Bottomland

Symbol	Soil Type Name	Predominant Slope (Percent)
Ba	Blockton silt loam	0-4
Ca	Burrell silt loam	0-3
Cb	Edina silt loam, terrace phase	0-3
Cc	Sandy terrace soils	0-3
Ea	Edina silt loam	0-2
Ga	Gara loam	3-8
Gc	Gara loam	9-18
Gd	Gosport silt loam	8-20
Ge	Grundy silt loam	1-4
Gf	Grundy silt loam, terrace phase	0-4
Ka	Keytesville silt loam	3-7
La	Lacona silt loam	2-8
Lc	Lacona silt loam	9-15
Ld	Lagonda silt loam	2-8
Ma	Mandeville silt loam	2-5
Mb	Mandeville silt loam	6-10
Na	Nodaway silt loam	
Sh	Sampsel silt loam	5-15
Sa	Seymour silt loam	1-4
Sb	Shelby loam	4-8
Sd	Shelby loam	9-15
Sf	Snead silty clay	6-15
Sg	Snead stony silty clay	8-20
Wa	Wabash silt loam	
Wb	Wabash silty clay loam	
Wc	Wabash clay	

SIGNS AND SYMBOLS

- Soil boundary
- Good motor road
- Dirt or private road
- Railroad
- Pipeline
- Gully
- Intermittent stream
- Perennial stream (small)
- Perennial stream (large)
- House
- Church
- Schoolhouse
- Cemetery
- Rock outcrop
- Section line
- Line of latitude or longitude



Location of this soil map in the county

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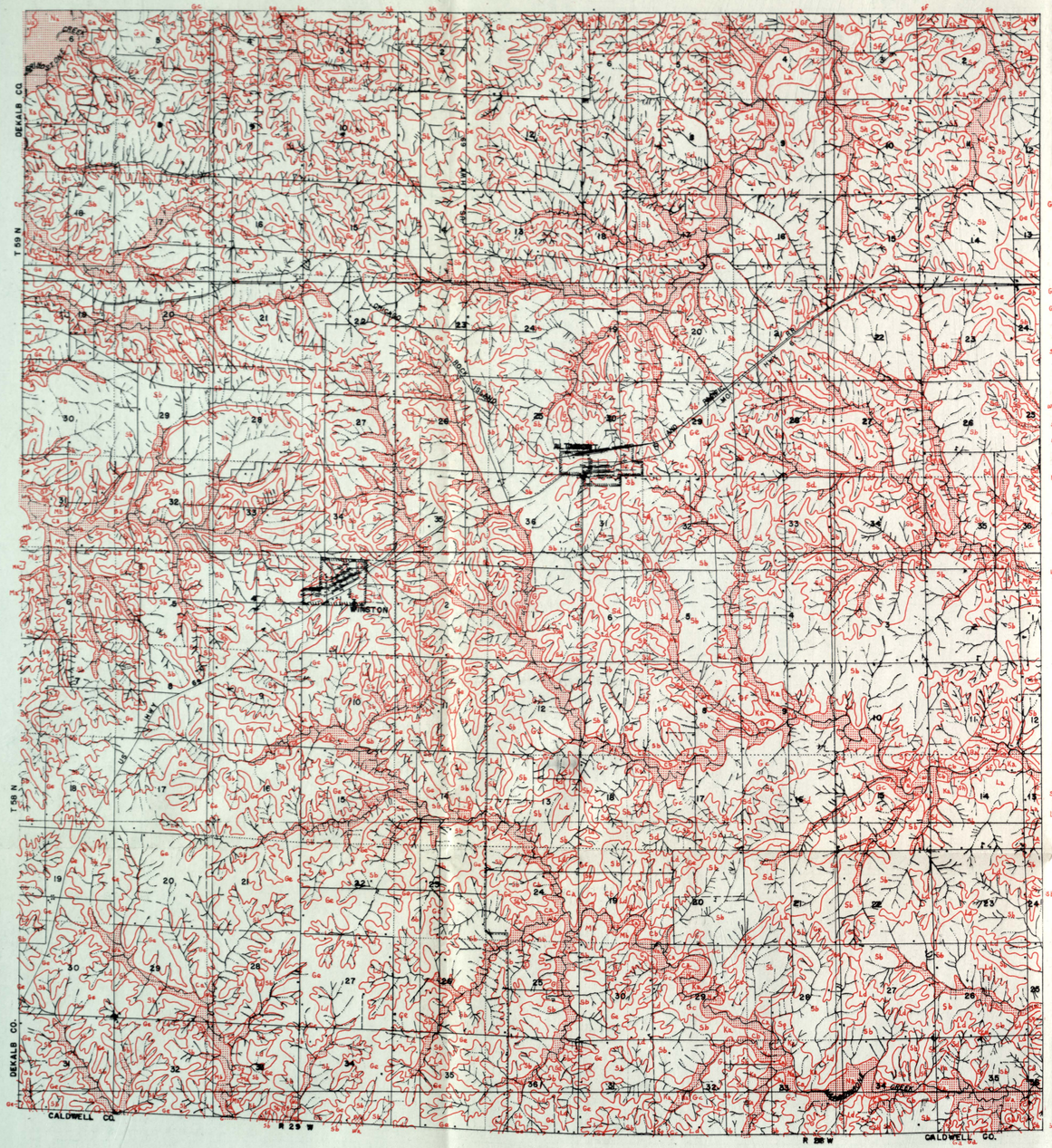


SOIL MAP OF DAVIESS COUNTY (SOUTHWEST SHEET)

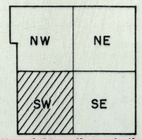
SOILS LEGEND

Upland — Bottomland

Symbol	Soil Type Name	Predominant Slope (Percent)	Symbol	Soil Type Name	Predominant Slope (Percent)
Ba	Blockton silt loam	0-4	Lc	Lacona silt loam	9-15
Ca	Burrell silt loam	0-3	Ld	Lagonda silt loam	2-8
Cb	Edina silt loam, terrace phase	0-3	Ma	Mandeville silt loam	2-5
			Mb	Mandeville silt loam	6-10
Cc	Sandy terrace soils	0-3	Na	Nodaway silt loam	
Ea	Edina silt loam	0-2	Sh	Sampsel silt loam	5-15
Ga	Gara loam	3-8	Sa	Seymour silt loam	1-4
Gc	Gara loam	9-18	Sb	Shelby loam	4-8
Gd	Gosport silt loam	8-20	Sd	Shelby loam	9-15
Ge	Grundy silt loam	1-4	Sf	Snead silty clay	6-15
Gf	Grundy silt loam, terrace phase	0-4	Sg	Snead stony silty clay	8-20
			Wa	Wabash silt loam	
Ka	Keytesville silt loam	3-7	Wb	Wabash silty clay loam	
La	Lacona silt loam	2-8	Wc	Wabash clay	

SIGNS AND SYMBOLS

- Soil boundary
- Good motor road
- Dirt or private road
- Railroad
- Pipeline
- Gully
- Intermittent stream
- Perennial stream (small)
- Perennial stream (large)
- House
- Church
- Schoolhouse
- Cemetery
- Rock outcrop
- Section line
- Line of latitude or longitude



Location of this soil map in the county

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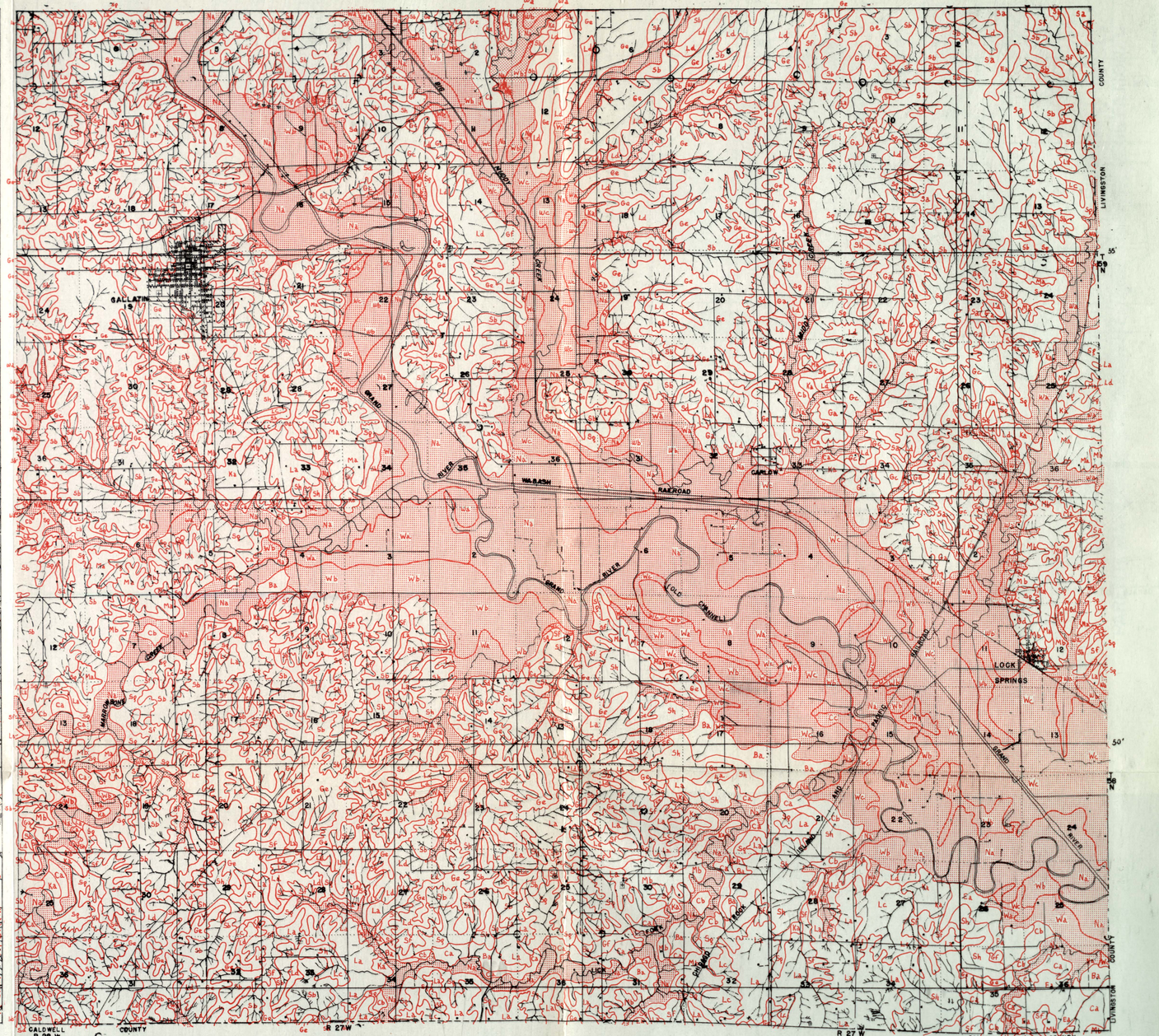


SOIL MAP OF DAVIESS COUNTY (SOUTHEAST SHEET)

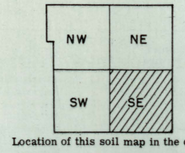
SOILS LEGEND

Upland — Bottomland

Symbol	Soil Type Name	Predominant Slope (Percent)	Symbol	Soil Type Name	Predominant Slope (Percent)
Ba	Blockton silt loam	0-4	Lc	Lacona silt loam	9-15
Ca	Burrell silt loam	0-3	Ld	Lagonda silt loam	2-8
Cb	Edina silt loam, terrace phase	0-3	Ma	Mandeville silt loam	2-5
			Mb	Mandeville silt loam	6-10
Cc	Sandy terrace soils	0-3	Na	Nodaway silt loam	
Ea	Edina silt loam	0-2	Sh	Sampsel silt loam	5-15
Ga	Gara loam	3-8	Sa	Seymour silt loam	1-4
Gc	Gara loam	9-18	Sb	Shelby loam	4-8
Gd	Gosport silt loam	8-20	Sd	Shelby loam	9-15
Ge	Grundy silt loam	1-4	Sf	Snead silty clay	6-15
Gf	Grundy silt loam, terrace phase	0-4	Sg	Snead stony silty clay	8-20
			Wa	Wabash silt loam	
Ka	Keytesville silt loam	3-7	Wb	Wabash silty clay loam	
La	Lacona silt loam	2-8	Wc	Wabash clay	

SIGNS AND SYMBOLS

- Soil boundary
- Good motor road
- Dirt or private road
- Railroad
- Pipeline
- Gully
- Intermittent stream
- Perennial stream (small)
- Perennial stream (large)
- House
- Church
- Schoolhouse
- Cemetery
- Rock outcrop
- Section line
- Line of latitude or longitude



Location of this soil map in the county

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DEFINITION OF SOIL TERMS USED

Alluvium . . . . . Fine soil material, such as sand, silt, and clay deposited by water. Bottomland soil.

Calcareous . . . . . Soil containing sufficient calcium carbonate to effervesce when treated with dilute hydrochloric acid.

Chert . . . . . An amorphous (without definite structure) form of silica rock (SiO_2) characterized by a splintery fracure.

Clay . . . . . Small mineral soil particles less than 0.002 mm. in diameter.

Clay soil . . . . . Soil containing 40% or more clay, and less than 45% sand, and less than 40% silt.

Loam . . . . . Soil containing 10 to 27% clay, and 28 to 50% silt, and less than 52% sand.

Loamy sand . . . . . Soil containing 10 to 25% silt and clay, and more than 75% sand.

Loess . . . . . A silty wind-lain material.

Profile . . . . . A vertical section of the soil through all its horizons and extending into the parent material.

Sand . . . . . Small rocks or mineral fragments having diameters ranging from 2 to 0.05 mm; very coarse sand 2 to 1 mm; coarse sand 1 to 0.5; medium sand 0.5 to 0.25; fine sand 0.25 to 0.1; very fine sand 0.1 to 0.05. The term "sand" is also applied to soils containing 90% or more of sand particles.

Sandy loam . . . . . Soil containing 40 to 85% sand, and less than 20% clay, and less than 50% silt.

Silt . . . . . Small mineral soil grains the particles of which range in diameter from 0.05 to 0.002 mm.

Silty clay . . . . . Soil containing 40% or more clay and 40% or more silt.

Silty clay loam . . . Soil containing 27% to 40% clay and less than 20% sand.

Silt loam . . . . . Soil containing 0 to 27% clay and 50% or more silt.

Soil horizon . . . . . A layer of soil, within the soil profile with more or less well-defined characteristics that have been produced through soil building processes.

Terrace . . . . . Usually known as second bottom or high bottom above the overflow flood plain.

Texture . . . . . The relative proprotion of sand, silt and clay.