UNIVERSITY OF ILLINOIS
Agricultural Experiment Station

SOIL REPORT No. 68

JASPER COUNTY SOILS

By R. S. SMITH and L. H. SMITH

URBANA, ILLINOIS, JUNE, 1940

"It must be remembered that the productive power of the soil is the basic support of all prosperity."

C. G. HOPKINS

"It is the duty of every landowner to see that his land when he leaves it is as good or better than when he received it."

J. G. MOSIER

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INTRODUCTORY NOTE

IT IS A MATTER of common observation that soils vary tremendously in their productive power, depending upon their physical condition, their chemical composition, and their biological activities. For any comprehensive plan of soil improvement looking toward the permanent maintenance of our agricultural lands, a definite knowledge of the various existing kinds or types of soil is a first essential. It is the purpose of a soil survey to classify the various kinds of soil of a given area in such a manner as to permit definite characterization for description and for mapping. With the information that such a survey affords, every farmer or landowner of the surveyed area has at hand the basis for a rational system for the improvement of his land. At the same time the Experiment Station is furnished a scientific inventory of the soils of the state; and with such an inventory as a basis it can proceed intelligently to plan those fundamental investigations so necessary for the solution of problems of practical soil improvement.

This county soil report is one of a series reporting the results of the soil survey which, when completed, will cover the state of Illinois. Each county report is intended to be as nearly complete in itself as it is practicable to make it, even at the expense of some repetition.

While the authors must assume the responsibility for the presentation of this report, it should be understood that the material for it represents the contribution of a considerable number of the present and former members of the Agronomy Department working in their respective lines of soil mapping, soil analysis, and experiment field investigation. In this connection special recognition is due to the men who carried on the field work of the Jasper county soil survey: D. C. Maxwell, leader of the field party, Herman Wascher, and F. E. Schlotz.

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JASPER COUNTY SOILS

By R. S. SMITH and L. H. SMITH[1]

GEOGRAPHICAL FEATURES

JASPER COUNTY is located in southeastern Illinois about 12 miles south of the terminal moraine of the Early Wisconsin ice sheet, known as the Shelbyville moraine, and is 10 miles east of the town of Effingham and 21 miles south of Mattoon. It is a medium-sized, rectangular county occupying an area of 488.48 square miles. Newton, located in the center of the county, is the county seat and principal town.

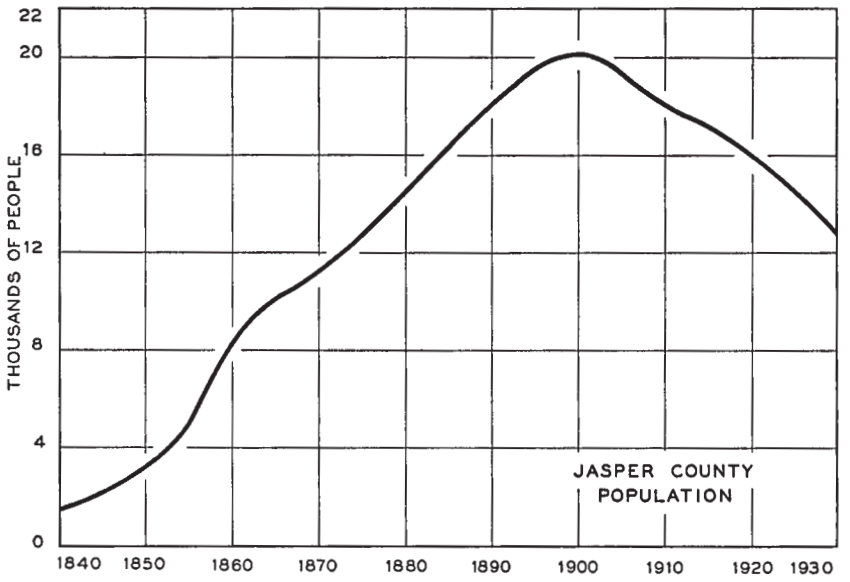

FIG. 1.—GROWTH OF POPULATION IN JASPER COUNTY

There was a steady increase in the population of Jasper county from the first recorded census in 1840 until the beginning of the present century, when the number of inhabitants was somewhat over 20,000. Since 1900 there has been a steady decline.

The hard roads and the gravelled secondary roads provide good facilities for marketing agricultural products. The Illinois Central Railroad provides rail transportation. The recent activity in oil development has not yet gone far enough to indicate how important petroleum may eventually become as an economic asset in the county.

[1]R. S. SMITH, Chief in Soil Physics and Soil Survey; and L. H. SMITH, Chief in Charge of Soil Survey Publications.

Agricultural Production

Agriculture is the leading industry in Jasper county, and corn is the most important crop, occupying about 60,000 acres a year as an average of the five years 1934-1938. The large corn acreage is due to the extensive area of bottomland, about 16 percent of the county consisting of stream bottoms. Tame hay is second to corn, being grown on about 34,000 acres as an average. Soybean acreage has expanded in recent years until there are now about 20,000 acres of soybeans in the county, over 5,000 acres of which are threshed. Other crops, listed in the order of their acreage, are oats, wheat, broomcorn, sweet clover, rye, cow-

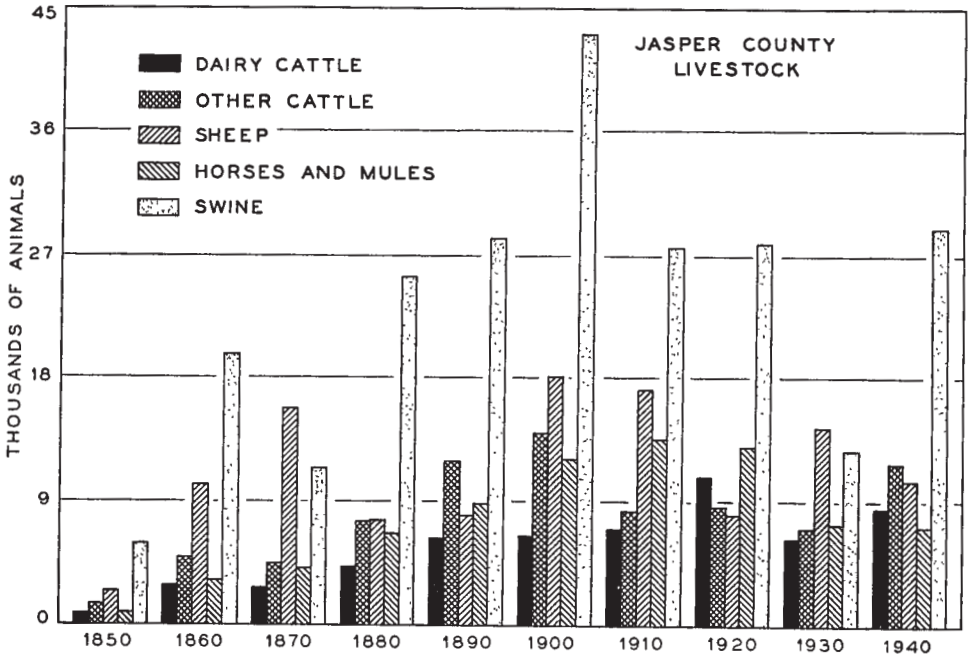

FIG. 2.—PRODUCTION OF PRINCIPAL CLASSES OF LIVESTOCK IN JASPER COUNTY

In the latter half of the nineteenth century livestock production showed a gradual increase that seemed to follow the growth in population. After 1900 the general increase ceased, and in some classes, as in swine production, dropped back materially. Horses and mules follow the general trend thruout the country in showing a distinct decrease during the past twenty years, during which mechanical power has come into increasing use.

peas, alfalfa, and potatoes. At the time of the 1930 U. S. Census, about 65,000 acres in the county were in pasture, of which about 53,000 acres were considered plowable. Fruits and vegetables are of little commercial importance.

The number of livestock in Jasper county is shown graphically in Fig. 2 by ten-year periods beginning in 1850. The number of dairy cattle reached its maximum in 1920; the other classes of livestock, except horses and mules, reached their peaks in 1900.

Poultry and poultry products are an important source of farm income in Jasper county. There are more than 250,000 chickens over three months old, and over 2 million dozen eggs are sold each year.

Climate

The humid, temperate climate of Jasper county is characterized by a wide range in temperature between the extremes of winter and summer and by a somewhat irregularly distributed rainfall. The mean summer temperature during the twenty-year period 1919 to 1938 inclusive, as taken from the records of the Flora Weather Station, was 75.8° F., and the mean winter temperature was 36.6° F. The highest temperature recorded during this twenty-year period was 112° F. in July, 1936; the lowest was —18° F. in January, 1930, a range of 130 degrees.

The average date of the last killing frost in spring during this twenty-year period was April 19, and that of the earliest in the fall was October 19, giving an average frost-free season of 184 days. The shortest growing season was 138 days in 1925, and the longest 221 days in 1929. The average length of the growing season in this region gives ample time to mature the crops commonly grown, altho occasionally, when the spring is wet and planting delayed, early frosts catch such crops as corn, broomcorn, and soybeans before they have fully matured.

The average annual rainfall recorded at the Olney Weather Station during this twenty-year period, 1919-1938, was 41.67 inches. The yearly rainfall varied from a minimum of 25.56 inches in 1936 to a maximum of 51.89 inches in 1927. The rainfall for the growing season, April thru September, has ranged from 13.63 to 31.17 inches. If it were properly distributed, the rainfall would usually be more than adequate for the crops of the region. However, summer crops on a number of the upland soils are damaged by rainless periods as short as three weeks during the critical periods of crop growth. (A rainless period is defined as one during which there is no rainfall of as much as half an inch within any 24-hour interval.) The weather records at Olney for the same twenty years show that during the growing season, April thru September, there were 56 rainless periods 21 days or more in length. Of these rainless periods 26 lasted for more than 30 days and one in 1922 lasted for 111 days.

When 30 days or more elapse without rain during a critical period of crop growth, such for example as the period during which corn pollinates, severe injury is likely to result. This is especially true on soils having heavy claypan subsoils. Rainless periods of less than 20 days probably do little permanent harm, especially on the more fertile soils, but summer crops on a number of the upland soils are damaged by rainless periods of as short duration as three weeks when they occur during critical periods of crop growth.

Topography and Drainage

The area now known as Jasper county was a nearly level plain before its dissection by stream erosion. Even now the divides between the streams are nearly level. These facts have an important bearing on the character of the soils which occur on these plains, as will be pointed out later. The altitudes of a few representative locations in the county are as follows: Hidalgo 589 feet, Falmouth 560 feet, Newton 541 feet, West Liberty 493 feet.

The southwest corner of the county drains into Little Wabash river and the rest of the county into Embarrass river. Both surface drainage and underdrainage are slow on the upland except on soil types Nos. 3, 4, 8, 13, 14, 128, and 143.

FORMATION OF JASPER COUNTY SOILS

Origin of Soil Material

The character of the soils in Jasper county has been strongly influenced by the material from which they were developed. This material was, in large part, deposited during the Glacial Epoch. The bottomland and terrace, or alluvial soils, have been formed from reworked sediments carried by the streams and deposited along their courses. Since the Glacial Epoch has played such an important role in determining the character of the soils in this county, a brief discussion of it is given here.

During the Glacial Epoch the climate alternated between long intervals in which it was much like that of today and intervals when the average temperature was so low that the snow which fell in winter did not entirely melt in the follow-

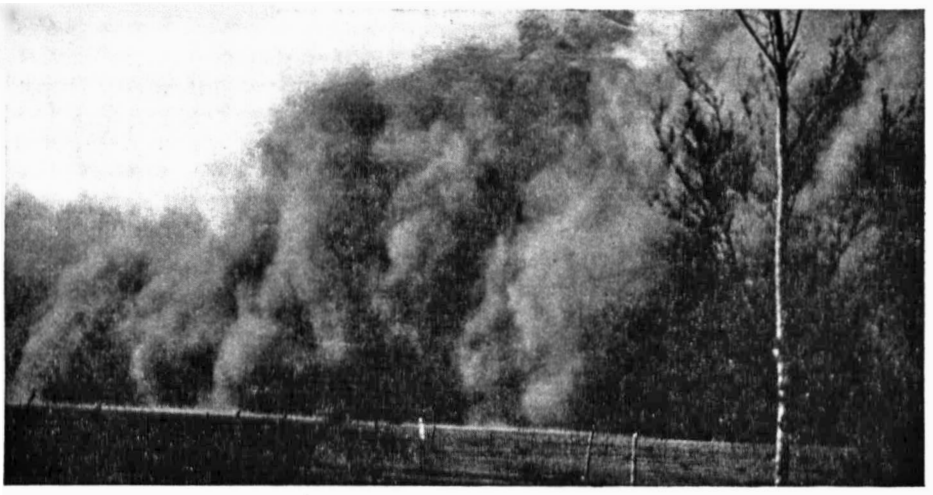

FIG. 3.—LOESS IN THE MAKING

The upland soils of Jasper county owe their productivity largely to the silty wind-blown material, called loess, deposited near the close of the ice age by dust storms similar to the one pictured above. In this region the Illinois river bottom was the source of most of the dust. This picture was taken in Texas in the spring of 1935. *(Photo by courtesy of U. S. Soil Conservation Service.)*

ing summer. During these colder intervals snow and ice accumulated in the northern parts of the continent in such enormous amounts that the pressure developed in the mass caused it to push outward from the centers of accumulation, forming glaciers.

The glaciers, aided by further accumulations of snow and ice at their margins, moved southward until they reached a region where the climate was warm enough to melt the ice as rapidly as it advanced. In moving across the country, the ice sheets picked up great masses of rock, gravel, sand, silt, and clay, ground them together, and sometimes carried them hundreds of miles. The pressure of the moving ice leveled off hills and filled in old valleys, often completely obliterating the features of the surface over which the ice passed. The mixture of mate-

rials deposited by a glacier is known as glacial drift. The term "drift" includes all glacial deposits such as "till," which was deposited by the ice sheets, as well as the reworked and more or less assorted and stratified outwash silts, sands, and gravels. The terms "till" and "outwash" will appear frequently in the discussion to follow and especially in the descriptions of the individual soil types.

The territory that is now Jasper county was probably covered by at least two of the four major ice advances, but only one, the Illinoian, has had much influence on the present topography and soils of the county. The Illinoian ice sheet covered the entire county, and on melting back left a broad gently undulating plain, large portions of which still remain.

After a long interval of time following the retreat of the Illinoian ice sheet, a thin blanket of loess, or wind-blown sediment, was deposited on the Illinoian till, which had been strongly weathered prior to the deposit of the loess. Sediment carried by Embarrass river, which rises some 60 miles to the north of Jasper county, forms a part of this loessial material, particularly in the northern part of the county. This sediment was comparatively unleached and was therefore better soil-forming material than the sediments originating on the old glacial plains south of the Shelbyville moraine. The beneficial effect of the more recent sediments will be mentioned later in the description of soil types, particularly that of Cisne silt loam.

How the Soils Were Developed

As soon as the parent loess, till, and outwash materials were deposited, they were subjected to the action of weathering forces, and the processes of soil development began. When first deposited, the loess, till, and outwash were high

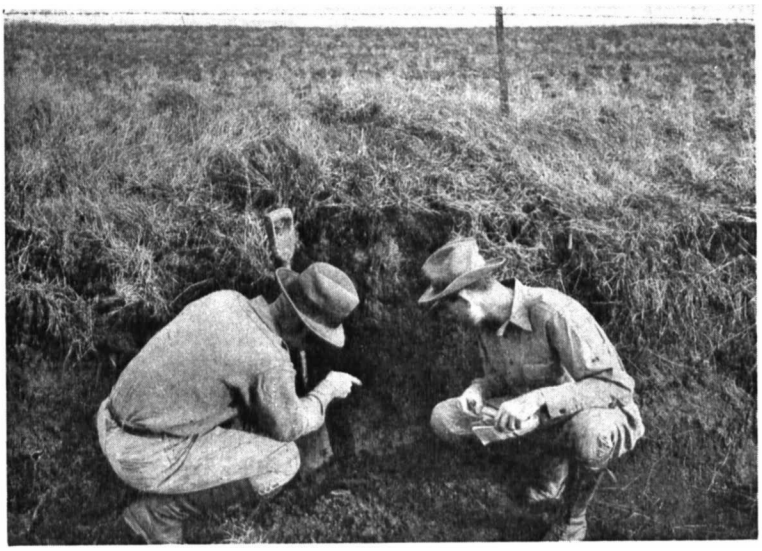

FIG. 4.—STUDYING THE SOIL PROFILE

One of the very pronounced characteristics observed in most soils is that they are composed of more or less distinct layers, or strata, often spoken of in soil literature as "horizons." The vertical section of the soil showing the arrangement of these horizons from the surface down is called the "soil profile."

in lime content and amply supplied with the mineral elements of plant food; but as time elapsed, the rain water, the oxygen and carbon dioxid of the air, and the products of the decaying plant residues attacked the primary minerals, leaching out the free lime and changing some of the minerals into clay. Since the weathering forces are most active near the surface and decrease in activity with increasing depth, various degrees or stages of weathering occur at different depths. Thus carbonates are first leached from the surface, where decomposition of the minerals is most active. Most of the organic matter accumulates in the surface soil, as is indicated by the darker color of the surface. The clay particles formed at or near the surface are gradually carried down by the percolating waters to a point where they accumulate, forming a clay subsoil. Thus horizons are gradually formed, and the parent material acquires characteristics that permit it to be called a soil.

During the period when clay is forming rapidly near the surface and before appreciable amounts have been carried down into the subsoil, the horizons of the soil are but faintly developed and the soil is said to be young, or in a youthful stage of development. This stage is best exemplified in Jasper county by Drury fine sandy loam, Type 75, found along Embarrass river. As weathering continues, the soil characteristics become more clearly developed and the horizons more sharply defined, and the soil enters what is considered a mature stage of development.

Prolonged weathering results in extensive decomposition of the primary soil minerals and the movement of a large amount of clay from the surface soil into the subsoil. As these processes continue, the soil becomes progressively older, or more thoroly developed, and finally becomes an old soil. This advanced stage of development is illustrated by Cisne silt loam in Jasper county.

As soon as the physical and chemical agencies of weathering began acting on the parent soil materials—forming, among other things, available plant nutrients —vegetation spread over the land. Two types of vegetation—the grass type and the tree or brush type—exerted important influences during the time the soils that now occur in the county were developing. Grass, thru its extensive fibrous root system, adds much organic matter to the soil, whereas under forest conditions little organic matter accumulates.

Drainage also influences soil development. Impeded drainage tends to retard the decomposition of organic matter but favors mineral decomposition and the formation of impervious claypan subsoils. Drainage has been very much restricted in many places in the upland portions of Jasper county, and it is here that we find "scalds," or slick spots, whose presence is supposed to be due to the accumulation of sodium salts as a result of the slow underdrainage.

Thus it is seen that differences in drainage, topography, vegetation, and parent soil material bring about differences in the environment under which soils develop, and consequently various kinds of soils are found in a region like Jasper county.

SOIL CLASSIFICATION AND MAPPING

In the soil survey the "soil type" is the unit of classification. Each soil type has a definite set of characteristics upon which its separation from other types is based. These characteristics are inherent in the strata or horizons which, taken

together, constitute the soil profile in mature soils. Among these characteristics may be mentioned texture, structure, color, and chemical composition.

Failure to appreciate that soil types are differentiated on the basis of the character of the *entire* soil section, and not on the surface alone, often makes it difficult to understand exactly what is meant by the term "soil type," for the surface stratum of one may be no different from that of another, yet the two may be widely different in character as well as in agricultural value. It is of utmost importance, therefore, in studying descriptions of soil types to get a clear mental picture of *all* the outstanding features of each soil type.

TABLE 1.—JASPER COUNTY SOILS: AREAS OF THE DIFFERENT TYPES

Type No.	Type name	Area in square miles	Area in acres	Percent of total area
1	Rinard silt loam	40.26	25 766	8.24
2	Cisne silt loam	146.58	93 811	30.01
3	Hoyleton silt loam	57.01	36 486	11.67
4	Walton silt loam	1.47	941	.30
8	Eroded gravelly loam	21.47	13 741	4.40
12	Wynoose silt loam	38.03	24 339	7.79
13	Bluford silt loam	64.33	41 171	13.17
14	Ava silt loam	1.97	1 261	.40
32	DeSoto fine sandy loam	3.51	2 246	.72
47	Shiloh silt loam	.75	480	.15
48	Ebbert silt loam	16.54	10 586	3.39
70	Beaucoup clay loam, terrace	3.17	2 029	.65
72	Sharon loam, first bottom	22.13	14 163	4.53
75	Drury fine sandy loam, terrace	1.71	1 095	.35
92	River sand, terrace	.18	115	.04
108	Bonnie silt loam, first bottom	50.58	32 371	10.35
120	Slick spot	11.74	7 514	2.40
128	Douglas silt loam	.33	211	.07
143	Ava sandy loam	6.72	4 301	1.37
	Total	488.48	312 627	100.00

It is likewise important to understand that a given type must of necessity include a range in properties. The boundaries between soil types are seldom sharp, there frequently being a transitional band which includes some of the properties of each type. Also, many small isolated spots of one or more distinct types must occasionally be included with the prevailing type in the area in order to avoid undue confusion and to simplify the printed map as much as possible.

Besides the natural range in properties found within a given type, there are other variations in producing capacity that have been brought about by differences in the management of the soil since it was brought under cultivation. For example, the productive capacity of soils developed on rolling topography may be easily and permanently impaired by management practices which permit unchecked soil erosion and thus cause permanent soil differences. Differences of a temporary nature may be induced by poor crop rotations; these are difficult if not impossible to show on a soil map.

Nineteen soil types are shown on the Jasper county soil map, of which five account for nearly 75 percent of the area of the county. The nineteen types are listed in Table 1, which shows the area of each in square miles and in acres and

indicates the percentage that each type constitutes of the total area of the county. The accompanying colored map, presented in two sections, shows the location and boundary of each type.

GENERAL SUGGESTIONS FOR SOIL IMPROVEMENT

A full discussion of the principles of soil fertility is beyond the scope of this report, but it would seem worth while at this point to comment briefly on some of the more important principles. The following discussion is based on the assumption that adequate drainage has been established.

Liming.—The first step in soil improvement, assuming adequate drainage has been provided, is the application of sufficient limestone to grow the crops which it is desired to grow. This involves the testing of each field for acidity and the

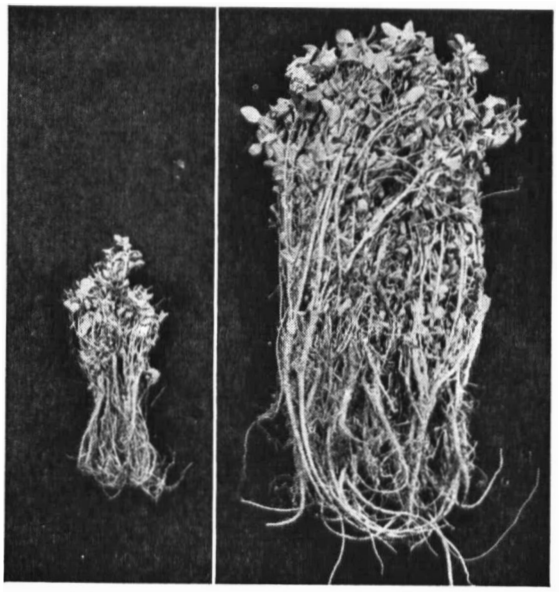

FIG. 5.—SWEET CLOVER DEMANDS LIMESTONE

These plants are from a second-year spring growth of sweet clover on one of the Illinois soil experiment fields. Each bundle is the growth from 4 square feet, the small one at the left having grown on unlimed soil, and the large one at the right on soil given a 2-ton application of limestone.

application of limestone as indicated by the tests. Detailed instructions for collecting samples and making tests are given in Circular 346, "Test Your Soil for Acidity."[1]

Organic Matter and Nitrogen.—The correction of the soil acidity paves the way for the second step in a soil-improvement program, that is, provision for an adequate supply of organic matter and nitrogen. Under a livestock system, where

[1]Any Illinois publication mentioned in this report may be obtained free of charge by addressing the Illinois Agricultural Experiment Station, Urbana (*see page 25*).

the major portion of the grain and hay grown on the farm is fed to livestock and the manure returned to the fields, a satisfactory nitrogen level can be maintained without additional treatment provided crop residues are plowed under instead of being burned and a good rotation is used. Circular 465, "Pasture Improvement and Management," contains much information of value to the livestock farmer. When a grain system of farming is being followed, it is necessary to grow and plow under green-manure crops if the nitrate level is to be maintained. This problem is more completely outlined in Circular 326, "A Nitrogen Factory on Every Farm." Probably the most effective green-manure crop for this purpose is sweet clover. Bulletin 394, "Sweet Clover in Illinois," will prove helpful in understanding the requirements of this crop.

Phosphate and Potash.—Having taken care of any need for lime and nitrogen, the next step is to test for phosphate and potash deficiencies. Instructions for taking samples and making the phosphate tests will be found in Circular 421,

FIG. 6.—RESULTS OF SOIL TREATMENT IN JASPER COUNTY

The need for soil treatment on a large portion of the land in Jasper county is well demonstrated on the plots of the soil experiment field at Newton. At the left is the corn produced on an untreated plot. The center picture shows the yield where the soil has been treated by adding limestone and phosphate and growing legumes. A still further increase is shown at the right as the result of adding potash to this combination.

"Testing Soil for Available Phosphorus." The results of this test are sometimes difficult to interpret properly, and it is therefore suggested that the county farm adviser be consulted for assistance in making the test. The test for available potash is more difficult to make than the available phosphorus test, and consequently it is not recommended that anyone attempt to make his own potash tests unless he is willing to spend some time and money in acquiring the proper equipment and learning the proper operating technic. A method for making this test is explained in a mimeographed folder, which can be obtained on request.

When both phosphate and potash are low, the application of either one by itself usually gives disappointing results. This is especially true on the old gray soils of southern Illinois. However, as a rule it can reasonably be expected that wheat will show the most response to phosphate applications and corn to potash. For maximum yields of all crops, however, it is essential to maintain adequate supplies of available nitrogen, phosphorus, and potassium in the soil thruout the growing season. If any one of these elements is not present in sufficient amounts, crop yields will be reduced no matter how ample the supply of the other elements may be.

Systems of Farming.—In general, a Jasper county farmer who keeps enough livestock to consume all his grain and roughage can maintain the productive capacity of his soil by using limestone and manure and growing legumes for hay and pasture. Where the soil is deficient in phosphorus or potassium, these elements may need to be applied in order to bring the yielding power of the soil up to a satisfactory level. If a grain system of farming is followed, best yields are obtained by plowing under sweet clover at regular intervals and applying phosphate and potash fertilizers whenever these plant foods become deficient.

Erosion Control.—Finally, the long-time effects of soil erosion must be given serious consideration even on moderately sloping land. The best and most economical method of reducing erosion losses is to keep a good cover of vegetation on the land as many months of the year as possible but particularly during the winter and early spring. Since this cannot be done satisfactorily on poor soils, the application of lime, phosphate, and potash as needed must be part of any permanent program of erosion control. Suggestions for methods of controlling erosion on specific soil types are given in the *Use and Management* paragraph under each soil type needing such protection. If more information is desired on erosion control, Farmers' Bulletin 1795, "Conserving Corn Belt Soil," should be studied. This bulletin may be obtained from the U. S. Department of Agriculture, Washington, D. C.

SOIL TYPES OF JASPER COUNTY: THEIR USE, CARE AND MANAGEMENT

A brief description of the outstanding characteristics of each soil type as mapped in Jasper county, together with some general recommendations as to its use, care, and management, is given on the following pages. Some of this information is summarized in Table 2, page 26.

The recommendations made for the management of the respective types are based on their requirements for the efficient production of the crops common to the region. Such matters as the growing of special crops, the location of the land with respect to markets, and other economic considerations have not been taken into account here.

In order to outline a complete soil-improvement and management program for a single field or farm, it would be necessary to know not only what soil types are involved but also what cropping and management practices have been followed in the past and what type of farming is to be followed in the future.

Obviously not all this information is available. The major purpose of this report, therefore, is to furnish such basic information about the various soil types as will enable a farmer to lay out his own program of soil management and improvement for the soils that occur on his farm.

Rinard silt loam (1)

Rinard silt loam is a grassland soil which occurs thruout the upland portions of Jasper county on nearly level topography. It occupies a total of 40.26 square miles or 8.24 percent of the area of the county. The areas of this soil type in the northern part of the county are somewhat darker colored than those in the southern part and are somewhat more productive.

The surface soil is a friable silt loam 0 to 7 inches thick which varies in color from gray to light brownish gray. The upper portion of the subsurface to a depth of about 13 inches is a light slate-gray, and the lower portion to a depth of about 25 inches is light gray. Thruout the subsurface there are spots and splotches of pale-yellow and reddish-brown iron concretions. The subsoil, extending to a depth of about 40 inches, is a drab-gray plastic slowly permeable clay containing pale-yellow spots and splotches. Beneath the subsoil there is a plastic and compact silty clay loam which is drab gray heavily splotched with yellow.

Use and Management.—Rinard silt loam is acid, low in organic matter and nitrogen, and has poor natural drainage. In improving this soil, drainage is the first thing to be taken care of. This is best accomplished thru the use of furrows and open ditches. Tile will draw fairly well in this soil if they are placed not over 28 inches deep, but the cost involved in tiling is probably not justified by the value of the land.

After drainage has been provided for, as much limestone should be applied as the acidity test has shown the soil needs, and clovers should be grown frequently. Altho no experiment field in the southern part of the state is located on this particular soil type, the experiment fields indicate that potash will be needed soon unless manure is applied. If this soil is well farmed and limestone is applied as needed, the use of clovers and either manure or potash should produce satisfactory crops except in seasons of unfavorable climatic conditions.

Cisne silt loam (2)

Cisne silt loam is the most extensive soil type in Jasper county, occupying a total of 146.58 square miles or 30 percent of the area of the county. It occurs only on nearly level topography, its slope rarely exceeding 1.2 percent. This soil in the northern third of the county is somewhat more productive than in the southern two-thirds, for toward the south "slick spots," or "scalds," described on page 23, are more numerous.

The surface soil is a gray or slightly brownish-gray friable silt loam 0 to 7 inches thick. The subsurface is a light-gray ashy friable silt loam. The subsoil, which is encountered at a depth of about 20 inches, is a yellowish slate-gray mottled with pale-yellow highly plastic and slowly pervious tight clay. The lower subsoil, which occurs below 34 inches, is a light yellowish-gray, yellow-mottled silty clay loam.

Use and Management.—Cisne silt loam is strongly acid, low in organic matter, nitrogen, potash, and phosphorus even tho it is a grassland soil, and has poor natural drainage. The slope is usually sufficient to make satisfactory surface drainage possible by means of furrows and open ditches. Tile do not draw well on this soil because of the claypan subsoil which occurs 18 to 20 inches beneath the surface. After adequate surface drainage has been provided, the same practices should be followed on this soil as suggested for Rinard silt loam, page 13.

FIG. 7.—RESPONSE OF CORN TO SOIL TREATMENT ON CISNE SILT LOAM

These two pictures illustrate the importance of soil treatment in growing corn on this type of soil. The plot at the left has had nothing added to improve the soil while the one at the right has received applications of limestone and manure. These pictures and those for Fig. 8 were taken in 1939 on the Newton soil experiment field.

Cisne silt loam responds somewhat less favorably to treatment than Rinard because the slowly permeable claypan of Cisne is nearer the surface and because slick spots are more numerous than on Rinard.

Results from the Toledo soil experiment field, Cumberland county, reported in Bulletin 425 of this Station, show the response that may be expected on Cisne in the northern part of Jasper county. The results from the Odin soil experiment field, Marion county, (Bulletins 258 and 382) indicate what may be expected on Cisne silt loam from tiling and subsoiling as well as from liming and fertilizer treatments. The data from these fields suggest that the yield of corn on Cisne silt loam when no limestone or other soil treatment is employed but when good seed and good tillage methods are used, will not exceed about 15 bushels to the acre as an average and that wheat will not exceed about 6 bushels.

When manure is applied at about the same rate as on these experiment fields, the yield of corn on the better Cisne should be about 30 bushels and of wheat 15 bushels. When limestone is used in addition to manure, corn should yield about 35 to 40 bushels on the better Cisne and wheat about 20 to 25 bushels. Rock

phosphate in addition to manure and limestone cannot be expected to cause sufficient increase in crops to pay for itself. Where manure is not applied, potash becomes necessary; its use in addition to crop residues and limestone should result in about the same crop yields as with manure and limestone.

The above yields cannot be expected on Cisne silt loam in the southern two-thirds of Jasper county. The Newton experiment field, located in this county, (Bulletin 402) suggests what may be expected on Cisne in this part of Jasper county.

FIG. 8.—RESPONSE OF WHEAT TO SOIL TREATMENT ON CISNE SILT LOAM

Given no soil treatment (as was the case with the plot at the left) Cisne silt loam yields only about 6 bushels of wheat to the acre. By applying manure and limestone (plot at right) yields can be brought up to 20 or 25 bushels on areas in the northern part of the county.

Hoyleton silt loam (3)

Hoyleton silt loam occurs thruout the upland portion of Jasper county, occupying a total area of 57 square miles, or 11.67 percent of the area of the county. It is a grassland soil and is found only on gentle slopes ranging between 1.5 and 3.5 percent.

The surface soil, 6 to 7 inches thick, has a silt loam texture and varies in color from gray to light brown. The upper subsurface is yellowish gray and friable. The lower subsurface is a pale yellowish-gray friable orange-mottled silt loam. The subsoil, which begins at a depth of about 18 inches, is a compact plastic tight clay of a pale yellowish-gray color mottled with reddish orange. Below about 35 inches the material is lighter in color and somewhat more friable than that immediately above.

Use and Management.—Hoyleton silt loam is strongly acid and low in organic matter, nitrogen, potash, and phosphorus. It has good surface drainage but slow underdrainage.

There is enough erosion on this soil to be harmful, particularly on the slopes approaching a grade of 3.5 percent. The slow permeability of the soil makes erosion-control difficult. It must be accomplished mainly by securing a vigorous growth of vegetation, but this cannot be done without applying limestone and using other soil treatments. Occasionally a terrace of the diversion-ditch type can be used to help stop a gully and thus supplement control with vegetation.

After erosion has been taken care of, clovers should be grown frequently, cultivated crops including soybeans should be kept at a minimum, and the acreage of permanent pasture should be increased. As in the case of the Rinard and Cisne soil types, potash will be needed unless manure is available.

The results from Series 100 and 200 on the Ewing soil-experiment field, located on Cisne silt loam in Franklin county, are valuable in indicating what yields may be expected on this soil in Jasper county. The Ewing field, which was started in 1910, shows clearly that with good farming but no soil treatment yields are extremely variable and that the maximum yields in favorable years are corn 25 bushels and wheat 18 bushels. The average yields on the untreated plots on this field for 1911 to 1936 inclusive were 13.7 bushels of corn and 4.1 bushels of wheat.

Altho this soil type is unproductive where it is unlimed and unfertilized, it responds to good soil treatment. Moreover, under good treatment the wide variations in yield above noted are reduced. The results from Ewing field indicate that when either manure and limestone, or limestone, legumes, and potash are used in connection with other good farming practices, average corn yields of 40 to 45 bushels an acre and wheat yields of 20 to 25 bushels may be reasonably expected. There is no indication from the Ewing results that rock phosphate needs to be applied at present.

Walton silt loam (4)

Walton silt loam is a minor soil type in Jasper county, occupying a total area of only 1.47 square miles. It is found chiefly south and southeast of Newton and occurs on slopes having a gradient of between 3.5 and 7 percent. Like the three soils previously described, it is a grassland soil.

The surface soil is a yellowish-gray friable silt 0 to 6 inches thick. The upper part of the subsurface is a yellow friable silt loam, and the lower portion is a deep yellow friable silt loam mottled with reddish orange. The subsoil, beginning at a depth of about 15 inches, is a reddish-yellow medium-compact and somewhat plastic clay. Below about 30 inches the material is a light-gray friable silt loam mixed with yellow and showing numerous iron concretions.

Use and Management.—Walton silt loam because of its tendency to erode should rarely be used for cultivated crops. It is acid and low in organic matter, nitrogen, phosphorus, and potash. Following the application of limestone, sweet clover does well; and following sweet clover, alfalfa does well, particularly when a fertilizer containing potash and phosphate is applied when the alfalfa is seeded. Since erosion-control is a major problem on this soil, it should be given the major consideration when the cropping system is being worked out, and all tillage should be on the contour.

Eroded gravelly loam (8)

(Now known as Hickory gravelly loam)

Eroded gravelly loam occurs in narrow irregular strips bordering the bottomlands in Jasper county and occupies a total of 21.41 square miles. The topography of this soil type is steep, making it subject to destructive erosion when tilled. It shows little or no profile development because of the removal of soil material by erosion.

Use and Management.—Eroded gravelly loam should be used for grass and for timber. It is difficult to get a good grass growth on it because the soil material is very low in organic matter and nitrogen and is strongly leached. Slopes which are to be seeded to permanent pasture should be limed if a vigorous growth of vegetation is to be secured. In view of the erosion hazard encountered in attempting to get these slopes into grass, the practicability of using at least the steeper ones for timber should be considered.

Wynoose silt loam (12)

Wynoose silt loam is a major soil type in Jasper county, occupying a total of about 38 square miles, or 7.79 percent of the area of the county. It is a timber soil, occupying nearly level to very gently sloping areas adjacent to the stream bottoms or to the eroded land bordering the stream bottoms.

The surface soil is a light yellowish-gray friable silt loam about 7 inches thick. The subsurface is light gray with a pale-yellowish cast when moist. Both the surface and subsurface contain reddish-brown iron concretions. The subsoil, which is encountered at a depth of about 18 inches, is light slate-gray with yellow mottlings and is compact and highly plastic. At a depth of about 40 inches the material becomes lighter colored and less compact and less plastic.

Use and Management.—Wynoose silt loam is strongly acid, low in organic matter, nitrogen, phosphorus, and potassium, and will not tile. Excess water may usually be removed without difficulty by means of furrows and open ditches. This soil is unproductive. Crop yields are disappointing unless limestone is used, legumes grown, and phosphate and potash applied as the need for them becomes apparent. If manure is applied, the need for potash and phosphate is less acute. Acidity tests should be made and limestone applied as indicated by the tests, then sweet clover seeded. After a few crops of sweet clover have been grown it becomes necessary to use a potash fertilizer unless manure is available.

Corn is not a good crop for this soil, as it commonly suffers from lack of moisture during July and August, but wheat does well when good farming methods are used. Under good farming and proper soil treatment this type will produce reasonably satisfactory crops, as has been demonstrated on the Raleigh experiment field located on Wynoose silt loam in Saline county.

Bluford silt loam (13)

Bluford silt loam occupies the gently rolling belts along the streams and drainage courses, now or formerly occupied by timber. It is an important soil type in Jasper county, occupying a total of 64.33 square miles, or a little over 13 percent of the area of the county.

The surface soil is a yellowish-gray friable silt loam 5 to 7 inches thick. The subsurface, extending to a depth of 16 to 18 inches, is grayish yellow in the upper part and somewhat ashy and gray in the lower part. The subsoil, extending to a depth of about 30 inches, is a mixed gray, pale-yellow, and dark-gray medium-compact and medium-plastic clay. The material below about 30 inches becomes more friable and frequently contains some small pebbles.

Use and Management.—Bluford silt loam is strongly acid and low in phosphorus, potash, nitrogen, and organic matter. It is subject to erosion, but as it responds well to soil treatment, it is possible to secure a good growth of vegetation to control erosion. Acidity tests should be made and limestone applied in order to grow sweet clover. After the clover has taken care of the nitrogen deficiency, and phosphate and potash have been applied as needed, corn will do well except in seasons which are climatically unfavorable.

When untreated, this soil does not produce satisfactory crops, as is indicated by the crop yields on Series 100 on the Enfield experiment field located on Bluford silt loam in White county. The following yields per acre are long-time averages from this series:

	Corn *bu.*	*Wheat* *bu.*
No treatment	11.2	7.9
Manure	21.4	10.2
Manure and lime	28.2	19.5
Manure, lime, and rock phosphate	31.0	24.1
Residues	14.7	9.9
Residues and lime	22.7	20.8
Residues, lime, and rock phosphate	24.9	23.9
Residues, lime, rock phosphate, and potash	34.5	28.7

These data indicate that limestone is needed even tho manure is used; that rock phosphate in addition to either manure and lime or residues and lime produces some, tho small, increases in the yields of corn and wheat; and also that potash is clearly beneficial when residues, lime, and rock phosphate are used.

On some areas mapped as this type much or all of the surface soil has been removed by erosion. Such areas are unsuited to tillage; they can best be used for pasture, tho soil treatment will be needed to get a satisfactory growth of grass.

Ava silt loam (14)

Ava silt loam is found on rolling topography. It is a minor type in Jasper county, occurring in small areas chiefly along Embarrass river and covering a total area of slightly less than 2 square miles.

The surface soil is a reddish-yellow friable silt loam 0 to 5 inches thick. The subsurface, extending to a depth of about 15 inches, is a yellow friable silt loam. The subsoil to a depth of about 25 inches is a reddish-yellow slightly compact friable silty clay loam. Below 25 inches the material is a yellow friable fine sandy silt loam.

Use and Management.—Ava silt loam is a good orchard soil and may be used to advantage for fruit production. It is low in phosphorus, potash, nitrogen, and organic matter and is acid. It has excessively rapid surface drainage and is sufficiently open to tile.

The primary consideration in the use and management of this soil is how to reduce soil losses from erosion. Because erosion-control on this soil type must be obtained mainly by keeping a covering of vegetation on it, tilled crops should be kept at a minimum and grasses should be grown. Mechanical structures such as terraces may be used to advantage in some places, but soil treatment must be used with them in order to get a vigorous growth of vegetation. Enough limestone should be applied to grow sweet clover. Clover and grasses should be grown until the physical condition of the soil has improved. After this has been done, an occasional tilled crop may be grown; however, heavy rainfall while a cultivated crop is on the land will cause considerable soil loss.

DeSoto fine sandy loam (32)

DeSoto fine sandy loam occupies a total of 3.5 square miles in Jasper county. It is found chiefly in the eastern part of the county along the eastern side of Hickory creek and North Fork. While found in association with Ava sandy loam, it was developed under conditions of poor drainage on nearly level topography while Ava sandy loam occupies rolling topography.

The surface soil is a light yellowish-gray fine sandy loam; the subsurface is a light-gray friable sandy silt loam. The upper subsoil, which occurs at a depth of about 19 inches, is a light-gray yellow-mottled compact medium-plastic clay; the lower subsoil, which occurs at about 29 inches, is a light yellowish-gray yellow-mottled compact and plastic semitight clay. Below 36 inches the material is a light-gray friable fine sandy silt loam heavily splotched with deep-yellow to brownish-black iron accumulations.

DeSoto fine sandy loam is similar to Wynoose silt loam, Type 12, page 17, in color and topography, but it has a higher agricultural value because it has a somewhat more permeable subsoil and a thin covering of recent wind-blown material on the surface.

Use and Management.—DeSoto fine sandy loam is low in nitrogen and organic matter and is acid. It does not produce very abundantly unless limed and well farmed, but it responds well to good treatment. Limestone, in the amount indicated by an acidity test, should be applied to grow sweet clover. After the nitrogen deficiency has been taken care of, it would be well to make trial applications of potash, especially for corn, and of phosphate, particularly for wheat.

Surface drainage should be provided by furrows and open ditches, tho after soil-improvement practices have increased yields, the installation of tile might well be considered.

Shiloh silt loam (47)

Shiloh silt loam is a minor soil type in Jasper county, covering a total area of only ¾ square mile. It occurs almost entirely in the northwestern corner of the county in association with Ebbert silt loam, Type 48, and occupies depressional areas.

The surface soil is grayish-black silt loam or silty clay loam. The subsurface, beginning at a depth of about 8 inches and extending to about 19 inches, is a dark-gray heavy clay loam. The subsoil is a grayish-drab plastic clay.

Use and Management.—Shiloh silt loam, if well drained, is one of the most

productive soils in Jasper county. It has poor natural drainage, but surplus water can be removed either by furrows and open ditches or by tile. Acidity tests should be made and sufficient limestone applied to grow clover, preferably sweet clover, in the rotation. With good drainage and good farming this is a productive soil.

Ebbert silt loam (48)

Ebbert silt loam, occupying a total area of 16.54 square miles, is one of the more important soils in Jasper county, particularly in the northwest corner. It occurs on nearly level areas, where drainage was originally poor, a condition favoring the accumulation of organic matter. Altho the natural drainage of this soil is poor, it can be drained by furrows and open ditches or by tile (see Fig. 9).

FIG. 9.—OPEN FURROWS ARE OFTEN USED TO PROVIDE DRAINAGE FOR EBBERT SILT LOAM

After adequate drainage has been provided, limestone applied, and clover grown, Ebbert silt loam may be expected to give good yields of the grain crops.

The surface soil is a dark-gray friable silt loam about 7 inches thick. The subsurface is a dull slate-gray friable silt loam mottled with pale yellow. The upper portion of the subsoil, which occurs at a depth of about 18 inches, is a drabbish-gray yellow-mottled plastic clay; the lower portion, which begins at a depth of about 36 inches, is a pale-yellow silty clay loam heavily splotched with gray.

Use and Management.—Ebbert silt loam is medium-acid and should be tested for acidity before clover is seeded, in order to supply organic matter and nitrogen. Good yields of the grain crops may be expected after adequate drainage has been provided, limestone applied, and clover grown.

Beaucoup clay loam, terrace (70)

This soil occurs on low terraces along Embarrass river, chiefly south of Ste. Marie. It developed under poor drainage conditions; and drainage is still difficult because of the nearly level topography of areas of this type and the heavy nature of the soil. It is a relatively unimportant soil in Jasper county, occupying a total of only 3.17 square miles.

The surface soil is about 8 inches thick, tho none of the soil layers or horizons are well developed. It is a heavy, rather plastic dark-gray clay loam. Below the surface soil the material becomes gradually more sticky and plastic and slate gray in color.

FIG. 10.—CORN ON BEAUCOUP CLAY LOAM, TERRACE

This type of soil is usually unproductive, but occasionally, where drainage is adequate, corn can be grown on it. It occupies about 3 square miles in Jasper county.

Use and Management.—Beaucoup clay loam is difficult to farm because of its heavy nature and poor natural drainage. Open ditches and furrows should be provided to remove excess water. Much of this soil is now in timber, and some of it is in weeds where the land is swampy. Corn is grown where drainage is the best.

Sharon loam, first bottom (72)

Sharon loam, first bottom, is an extensive bottomland soil in Jasper county, occupying a total area of 22.13 square miles.

This soil consists of recent sediments and therefore shows little profile development. As these sediments vary in texture as well as in other features, there is considerable variation within this soil type. In the Embarrass river bottom some of the material was brought from as far north as Champaign county and is less leached than the material originating locally. This difference in the character of the sediments makes this soil in the northern part of the Embarrass bottom more valuable agriculturally than it is in the southern part and in the smaller bottoms.

Use and Management.—Sharon loam, first bottom, is a productive soil; much of it will grow alfalfa without the application of limestone. Corn is the principal crop grown because it does well on this soil and because the danger of overflow in the spring prevents the growing of early-season crops. The higher portions, on which alfalfa and the clovers are grown, should be tested for acidity unless the recent growing of these crops has shown clearly that limestone is not

FIG. 11.—TWO BOTTOMLAND TYPES, PRODUCTIVE BUT SUBJECT TO OVERFLOW

The corn is growing on Sharon loam, first bottom, and the alfalfa in the foreground is on Bonnie silt loam, first bottom. Usually found in association, these two types together cover about 15 percent of Jasper county, occupying most of the Embarrass river bottom.

needed. Overflow will maintain this soil in a good, productive condition; but unless overflow occurs it will be necessary to apply limestone and to grow clovers to avoid a decline in yields.

Drury fine sandy loam, terrace (75)

Drury fine sandy loam, terrace, is a minor soil type in Jasper county, occurring in small tracts along Embarrass river and occupying a total of only 1.71 square miles. It consists, for the most part, of material washed down from adjacent areas of Ava sandy loam. It occupies nearly level topography, is well drained, and in places is underlain by coarse material which makes it drouthy.

The surface is a yellowish-gray sandy loam or fine sandy loam, which commonly becomes sandier with increasing depth. This soil, as it occurs in Jasper county, is not typical of Drury. It is of lower agricultural value than elsewhere in the state.

Use and Management.—The diverse character of Drury fine sandy loam, terrace, as it occurs in Jasper county makes impossible any very definite statements about its use. However, where limestone is applied, it is, for the most part, adapted to alfalfa, and other crops do well except in drouthy areas.

River sand, terrace (92)

A few sandy knolls occur in the Embarrass bottom in association with Ava sandy loam, and these are indicated on the soil map as River sand. The total area of these knolls is only 115 acres. Their small size makes it necessary to handle them in the same way as the surrounding fields.

Bonnie silt loam, first bottom (108)

Bonnie silt loam, first bottom, is an extensive soil type in Jasper county, occupying a total area of 50.58 square miles and occurring in the small as well as

large bottoms. This soil was formed from sediment deposited by the streams and has not been in place long enough to develop a well-defined profile.

The surface soil is sandy and silty in texture and gray in color. At a depth of 6 to 10 inches the color grades into light gray. With increasing depth, the color becomes darker gray and a rather plastic condition prevails instead of the friable consistency found in the subsurface.

Use and Management.—This soil is low in nitrogen and organic matter and varies in acidity from slight to strong, depending on the source of the sediment and the frequency of overflow. As is true of Sharon loam (page 21), this soil is somewhat better in the upper Embarrass bottom than in the lower. Corn is the major crop grown, and good yields are produced except when there is injury from overflow or when the season is climatically unfavorable.

The advisability of applying limestone or using other soil treatment depends on the frequency of overflow. Areas subject to overflow every year cannot be limed to advantage since the crops which can be grown under such conditions do not respond sufficiently to limestone to justify its application. A limestone-legume program can be adopted to advantage on areas that do not overflow or which overflow infrequently.

Slick spots (120)

"Slick spots," also known as "scalds" or "scald spots," occur thruout the upland of Jasper county but are more abundant in the southern half of the county than in the northern. They are characterized by their unproductiveness, irregularity in shape and size, and their occurrence only on nearly level topography. The slick spots shown on the soil map of Jasper county total 11.74 square miles, but numerous spots occur which are too small to be shown. Probably at least 10 percent of the flat portion of the upland in Jasper county is occupied by slick spots.

Slick spots can be identified in the field by their lighter-colored surface and their greater moistness compared with adjacent areas. Many of the mud holes in roads during wet seasons develop on slick spots. These spots, when they become dry, do not absorb water readily and are very hard and compact. When they become soaked, they tend to remain saturated.

The surface soil is a light-gray silt loam about 3 to 7 inches thick. The subsurface is often absent but when present is an ashy white silt loam varying in thickness from a mere film to 6 or 8 inches. The subsoil, which begins at depths varying from 6 to about 15 inches, is a clay which is sticky when wet and hard when dry. The color of the subsoil varies greatly; it is sometimes light brown with no gray in the upper part, and sometimes a light greenish gray or pale yellowish gray. Limestone pellets commonly occur somewhere in the subsoil at a depth varying from 10 or 12 inches to 36 inches.

Use and Management.—Lack of sufficient moisture is one of the causes of poor crops on slick spots. Corn suffers more from this deficiency than does small grain.

In treating slick spots drainage must be provided by means of furrows and open ditches. Where drainage cannot be provided, no attempt at treatment is recommended. If the surface soil is acid, as it usually is, enough limestone should

be applied to enable sweet clover to grow. The sweet clover may be allowed to reseed itself for several years and may then be plowed under. Practical experience has shown that the beneficial effect of an application of animal manure lasts only one year on these slick spots; better returns from the manure are obtained if it is applied to other soil types. No further treatment can be suggested at this time.

Crop yields on these spots vary from nothing in unfavorable years to a small yield in a season when the moisture is just right. Yields of small grain are almost always better than those of corn.

Douglas silt loam (128)

Douglas silt loam is a minor soil in Jasper county, occupying only ⅓ square mile and occurring in small areas on glacier-deposited knolls chiefly southwest of Ste. Marie.

The surface soil is a grayish light-brown friable silt loam 0 to 7 inches thick. The subsurface, which extends to a depth of about 14 inches, is a yellowish friable silt loam. The subsoil, which occurs at a depth of 14 to 24 inches, is a reddish-yellow slightly compact silt loam, containing a few small pebbles in the lower portion. It is underlain by a mixed sandy and gravelly till, usually at depths ranging from 24 to 30 inches.

Use and Management.—Douglas silt loam is subject to severe erosion. If it is cultivated, deterioration is likely to be rapid because of the loss of the upper soil and the exposure of the underlying leached glacial till. If carefully handled, it is a good soil. Where limestone is applied, it is well adapted to alfalfa.

Ava sandy loam (143)

Ava sandy loam occurs along the eastern side of the Embarrass, Hickory creek, and North Fork bottomlands. The sandy material of which this soil is composed was deposited in the form of ridges and knolls blown by the wind from the adjacent bottom.

The surface soil is a yellowish-gray sandy loam. The subsurface, beginning at a depth of about 7 inches, is a reddish-yellow fine sandy loam. The subsoil, which varies in depth from 12 to 20 inches, is a reddish-yellow slightly compact clayey sandy loam. The material below 20 to 30 inches is a reddish-yellow friable sandy loam.

Use and Management.—Ava sandy loam has a tendency to be drouthy. It is not ordinarily considered a good corn soil, altho following the growing of a legume, good corn yields are produced in seasons of well-distributed rainfall. Where sufficient limestone has been applied, sweet clover does well; and after sweet clover, good yields of alfalfa are obtained.

SUMMARY OF IMPORTANT CHARACTERISTICS OF JASPER COUNTY SOILS

A summarized statement of some of the agriculturally more significant characteristics of the soil types shown on the soil map of Jasper county is presented in Table 2, page 26. Topography, drainage, acidity, the contents of organic matter and of available phosphorus are all indicated, together with an index of the productivity of each soil type, in untreated condition, for crops, pasture, and forest.

The information in this table is necessarily general and should not be taken to mean that *every* farm or field of a given soil type will necessarily exhibit the exact characteristics indicated here. As already pointed out, acidity and productivity are likely to vary within areas of the same soil type; and for that reason every field should be tested as recommended in the more detailed discussion of the types, and treatments should be based on the results of the tests.

It must also be remembered that soils differ in adaptation and in their response to soil treatment, and that these differences are not always definitely indicated by the productivity index. Since it would be impracticable to present such differences in terms of simple index numbers, readers must depend on the management discussion under each soil type for those details.

THE FOLLOWING PUBLICATIONS mentioned in this report may be obtained free of charge by addressing the UNIVERSITY OF ILLINOIS, COLLEGE OF AGRICULTURE, URBANA, ILLINOIS.

A Nitrogen Factory on Every Farm. C-326.
Test Your Soil for Acidity. C-346.
Testing Soil for Available Phosphorus. C-421.
Pasture Improvement and Management. C-465.
Sweet Clover in Illinois. B-394.

Farmers' Bulletin 1795, "Conserving Corn Belt Soil," may be obtained from the U. S. Department of Agriculture, Washington, D. C.

TABLE 2.—JASPER COUNTY SOILS: SUMMARY OF CHARACTERISTICS, PROPERTIES, AND ADAPTATION

Type No.	Type name	See page[1]	Topography[2]	Drainage[3]		Reaction	Available phosphorus	Organic matter	Productivity indexes[4]		
				Surface	Under				Field crops	Pasture	Forest
1	Rinard silt loam	13	Nearly level or depressional	Slow	Very slow	Strongly acid	Low	Low	7	B	B
2	Cisne silt loam	13	Nearly level to undulating	Moderate	Very slow	Strongly acid	Low	Low	8–9[5]	C	C
3	Hoyleton silt loam	15	Gently rolling	Moderate	Very slow	Strongly acid	Low	Low	8–9[5]	C	C
4	Walton silt loam	16	Rolling	Moderately rapid	Slow	Medium to strongly acid	Low	Low	8–9[6]	C	B
8	Eroded gravelly loam	17	Steep	Excessive	Slow	.....	.....	Low	10	C	C
12	Wynoose silt loam	17	Nearly level to undulating	Slow	Very slow	Strongly acid	Low	Low	9	C	C
13	Bluford silt loam	17	Gently rolling	Moderate	Slow	Strongly acid	Low	Low	8–10[6]	C	B
14	Ava silt loam	18	Rolling	Rapid	Moderately slow	Medium to strongly acid	Low	Low	8–10[6]	C	A
32	DeSoto fine sandy loam	19	Nearly level to gently rolling	Slow to moderate	Moderate	Medium acid	Low	Low	8	C	A
47	Shiloh silt loam	19	Nearly level	Slow	Moderate	Medium acid	Medium	Medium	4	..	..
48	Ebbert silt loam	20	Nearly level	Slow	Moderately slow	Medium acid	Low	Low	6	B	A
70	Beaucoup clay loam, terrace	20	Nearly level to depressional	Slow	Slow	Medium to slightly acid	Medium	Medium	6	B	B
72	Sharon loam, bottom	21	Nearly level	Slow	Moderate	Medium acid to neutral	Medium	Low	4–6[7]	A	A
75	Drury fine sandy loam, terrace	22	Gently undulating	Moderate	Moderate	Medium acid to neutral	Medium	Low	5	A	A
92	River sand, terrace	22	Gently rolling	Moderate	Moderate to rapid	Medium acid	Low	Low	9	C	B
108	Bonnie silt loam, bottom	22	Nearly level	Slow	Moderate	Medium acid	Low	Low	6–10[7]	B	A
120	Slick spots	23	Nearly level	Slow	Very slow	Medium to strongly acid	Low	Low	10	C	C
128	Douglas silt loam	24	Rolling	Rapid	Moderate	Medium acid	Low	Low	4–7[6]	B	A
143	Ava sandy loam	24	Rolling	Rapid	Rapid	Acid	Low	Low	8	C	B

[1]For description of soil type turn to page indicated.

[2]Topography is expressed by the following terms based on the respective slopes: *nearly level*, less than .5 percent slope; *undulating*, .5 to 1.5 percent; *gently rolling*, 1.5 to 3.5 percent; *rolling*, 3.5 to 7 percent; *strongly rolling*, 7 to 15 percent; *steep*, greater than 15 percent.

[3]Of the terms used to express drainage, *moderate* expresses the most desirable drainage.

[4]The index number assigned to a soil type for production of field crops is based on the ability of the type to produce the major crops grown in the region, without soil treatment but with the soil in a cleared and drained condition. The scale used is 1 to 10, the *most productive soil* in the state being rated as 1 and the *least productive* as 10. The indexes for pasture and forest are indicated by A, B, and C, A signifying the best and C the poorest.

[5]Given variable rating because of variation from north to south.

[6]Given variable rating because of differences in degree of erosion.

[7]Given variable rating because of variation in drainage and in character of sediments.

ALPHABETICAL INDEX TO SOIL TYPES

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29 Mercer, 1925
30 Johnson, 1925
31 Rock Island, 1925
32 Randolph, 1925
33 Saline, 1926
34 Marion, 1926
35 Will, 1926
36 Woodford, 1927
37 Lee, 1927
38 Ogle, 1927
39 Logan, 1927
40 Whiteside, 1928
41 Henry, 1928
42 Morgan, 1928
43 Douglas, 1929
44 Coles, 1929
45 Macon, 1929
46 Edwards, 1930
47 Piatt, 1930
48 Effingham, 1931
49 Wayne, 1931
50 Macoupin, 1931
51 Fulton, 1931
52 Fayette, 1932
53 Calhoun, 1932
54 Ford, 1933
55 Jackson, 1933
56 Schuyler, 1934
57 Clinton, 1936
58 Washington, 1937
59 Marshall, 1937
60 Putnam, 1937
61 Wabash, 1937
62 Vermilion, 1938
63 St. Clair, 1938
64 Stark, 1939
65 Boone, 1939
66 Shelby, 1939
67 DeWitt, 1940
68 Jasper, 1940

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