

Issued July 15, 1915.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF ALABAMA, EMMETT O'NEAL, GOVERNOR;
REUBEN F. KOLB, COMMISSIONER OF AGRICULTURE AND INDUSTRIES;
EUGENE A. SMITH, STATE GEOLOGIST.

SOIL SURVEY OF BULLOCK COUNTY,
ALABAMA.

BY

HOWARD C. SMITH, OF THE U. S. DEPARTMENT OF AGRICULTURE, AND W. E. WILKINSON, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1918.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1915.

BUREAU OF SOILS.

MILTON WHITNEY, *Chief of Bureau.*
ALBERT G. RICE, *Chief Clerk.*

SOIL SURVEY.

CURTIS F. MARBUT, *In Charge.*
G. W. BAUMANN, *Executive Assistant.*

COMMITTEE ON THE CORRELATION AND CLASSIFICATION OF SOILS.

CURTIS F. MARBUT, *Chairman.*
Hugh H. Bennett, Inspector, Southern Division.
W. Edward Hearn, Inspector, Southern Division.,
Thomas D. Rice, Inspector, Northern Division.
W. E. McLendon, Inspector, Northern Division.
Macy H. Lapham, Inspector, Western Division.
J. W. McKEBICHER, *Secretary.*

Issued July 15, 1915.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF ALABAMA, EMMETT O'NEAL, GOVERNOR;
REUBEN F. KOLB, COMMISSIONER OF AGRICULTURE AND INDUSTRIES;
EUGENE A. SMITH, STATE GEOLOGIST.

SOIL SURVEY OF BULLOCK COUNTY,
ALABAMA.

BY

HOWARD C. SMITH, OF THE U. S. DEPARTMENT OF AGRICULTURE, AND W. E. WILKINSON, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1913.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1915.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., December 26, 1914.

SIR: Under the cooperative agreement with the State of Alabama a soil survey of Bullock County was carried to completion during the field season of 1913.

I have the honor to transmit herewith the manuscript and map covering this work, and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1913, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

CONTENTS.

	Page.
SOIL SURVEY OF BULLOCK COUNTY, ALABAMA. By HOWARD C. SMITH, OF THE U. S. DEPARTMENT OF AGRICULTURE, and W. E. WILKINSON, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES-----	5
Description of the area-----	5
Climate-----	8
Agriculture-----	10
Soils-----	17
Norfolk series-----	19
Norfolk coarse sand-----	20
Norfolk sand-----	20
Norfolk fine sand-----	21
Norfolk fine sandy loam-----	21
Orangeburg series-----	22
Orangeburg sandy loam-----	22
Orangeburg fine sandy loam-----	23
Ruston series-----	24
Ruston gravelly sandy loam-----	24
Ruston sandy loam-----	25
Ruston fine sandy loam-----	26
Susquehanna series-----	27
Susquehanna stony sandy loam-----	27
Susquehanna fine sandy loam-----	28
Susquehanna clay-----	29
Portsmouth series-----	30
Portsmouth fine sandy loam-----	30
Plummer series-----	31
Plummer fine sandy loam-----	31
Houston series-----	32
Houston clay-----	32
Oktibbeha series-----	34
Oktibbeha fine sandy loam-----	35
Oktibbeha clay-----	35
Greenville series-----	36
Greenville gravelly sandy loam-----	36
Leaf series-----	37
Leaf fine sandy loam-----	37
Myatt series-----	38
Myatt fine sandy loam-----	38
Kalmia series-----	39
Kalmia fine sand-----	39
Kalmia fine sandy loam-----	39
Kalmia silt loam-----	40
Thompson series-----	40
Thompson sand-----	41

SOIL SURVEY OF BULLOCK COUNTY, ALABAMA—Continued.

Soils—Continued.	Page.
Ocklocknee series.....	41
Ocklocknee fine sandy loam.....	42
Ocklocknee loam.....	42
Ocklocknee clay.....	43
Bibb series.....	43
Bibb fine sandy loam.....	44
Bibb silty clay loam.....	44
Trinity series.....	44
Trinity clay.....	45
Hannahatchee series.....	45
Hannahatchee fine sandy loam.....	46
Hannahatchee loam.....	47
Miscellaneous material.....	47
Meadow.....	47
Summary.....	48

 ILLUSTRATIONS.

 FIGURE.

Fig. 1. Sketch map showing location of the Bullock County area, Alabama..	Page. 5
---	------------

 MAP.

Soil map, Bullock County sheet, Alabama.

SOIL SURVEY OF BULLOCK COUNTY, ALABAMA.

By HOWARD C. SMITH, of the United States Department of Agriculture, and
W. E. WILKINSON, of the Alabama Department of Agriculture and Industries.

DESCRIPTION OF THE AREA.

Bullock County is situated in the southeastern part of Alabama. It is bounded on the north by Montgomery and Macon Counties, on the east by Russell and Barbour Counties, on the south by Barbour and Pike Counties, and on the west by Pike and Montgomery Counties. The county is irregular in outline, and has a maximum length from east to west of 34 miles and a maximum width north and south of 29 miles. It comprises an area of 607 square miles, or 388,480 acres.

Chunnenuggee Ridge divides the county in two parts. This ridge enters from Montgomery County and extends from the southwestern part of Bullock County in a general northeasterly direction to the vicinity of Suspension, and thence to Enon and southeastward. The ridge is an important physiographic feature of this region, forming the watershed of three river systems. It also separates the two main topographic divisions of the county, namely, the "prairie region," comprising the northern section, and the "sandy-land region" to the south. There are also two minor topographic divisions, the first and second bottoms, which are developed throughout the county. Each of these four topographic divisions has its individual characteristics of topography and soils.

In some locations the prairie section has a hilly or even a rough topography; in others the surface is undulating. Immediately north of the Chunnenuggee Ridge there is a belt of low hills and sharp, winding, irregular ridges with a network of narrow V-shaped valleys and "wet-weather" streams. These features are especially prominent in the vicinity of Mount Hilliard, near Union Springs, and at Enon. The roughest topography is along the northern escarpment of this ridge, where the Susquehanna soils are encountered. From the center of the county westward the relief becomes bolder, the



FIG. 1.—Sketch map showing location of the Bullock County area, Alabama.

roughest country occurring in T. 13 and 14, R. 21, and in T. 13, R. 22. The southern part of T. 12, R. 25 and 26 also is badly dissected.

As distinguished from this "hill-prairie" country, the true prairie consists largely of the Houston and Oktibbeha soils. In its typical development from Union Springs northwestward to the Montgomery County line this region is one of low relief. The surface is undulating to gently rolling and the uplands are crossed by low, flat-topped divides with sides gradually sloping to the broad bottoms along the sluggish, meandering streams. As a rule the surface is subject to greater variation than in other counties of Alabama or Mississippi not on the outer border of the prairie belt.

The drainage of this region is mainly through several large creeks emptying into the Alabama and Chattahoochee Rivers. There are a large number of streams in this prairie region, which have effected extensive erosion. Nearly all of these streams are intermittent. All the stream-valley bottoms are extremely wide in proportion to the length of the streams. Some creeks within 6 miles from their source have well-developed first and second bottoms one-fourth to one-half mile in width.

The elevations along the Central of Georgia Railway range from about 260 to about 530 feet above sea level. Higher elevations are attained in the southwestern part of the county. High Ridge is apparently the highest point, and the point at which Line Creek leaves the county, 5 miles north of Fitzpatrick, is probably the lowest.

The "sandy-land" region, comprising that portion of the county south of the Chunnenuggee Ridge, varies widely in topography. The northernmost portion consists of a broad, sandy upland plain crossed by small streams. The divide between the Conecuh and Alabama Rivers is distinct, and the change from the clayey, dissected country on the north to the rather level, deep sands is a striking and constant topographic feature. As the Conecuh is approached from either side the valleys of the tributary streams become deeper and erosion is more pronounced. There are several square miles in the southern part of T. 12, R. 23, which are somewhat hilly. A small section in the eastern part of the county, drained by Cowikee Creek, has a topography embracing features common in the rougher part of the prairie region and in the sandy-land region. The relief is sharper and the county is less thickly populated near the southeastern corner, where large forested areas occur.

The watershed of the Pea River includes a large area in the southeastern part of the county. Here the topography consists of low, rounded hills and dissection has produced rather deep, steep-sided valleys. In a strip south of Mountain View Church some rough, stony areas occur.

The line separating the terrace and the bottom lands from the uplands is generally very distinct, as south of Hortonville Church, in T. 14, R. 24, or on Cowikee Creek south of Guerryton, in T. 14, R. 25. The red, eroded, and gullied upland slopes, with an intricate network of streams and steep-sided valleys, are in striking contrast to the nearly level, gray sandy surface of the lower-lying terrace. In many places, however, as in T. 11, R. 24, on the Pea River, the boundary between terrace and upland may consist of a gentle streamward slope, often of a colluvial nature, and in places, such as near Carlisle Mill, the line between the terrace and the upland is necessarily somewhat arbitrarily drawn.

The first bottoms are sufficiently wide to be mapped on nearly every stream having a length of over a mile, and are normally subject to overflow. In the northern part of the county, although the streams flow in well-defined channels, the bottoms are unusually wide. A good example of this is seen along Bughall and Leather Breeches Creeks, where crossed by the Central of Georgia Railway, between Thompson and Fitzpatrick. Coleman Creek bottoms are three-fourths mile wide only 8 miles from its source. On the other hand, the bottoms of the Conecuh River are seldom over one-fourth mile in width. The first bottoms comprise a relatively large total area in this county.

There is an abundant supply of excellent water for domestic and farm use in all parts of the county. In the prairie region, owing to the excess of lime in the surface formations, it is necessary to drill through the Selma and Ripley formations to depths of 150 to 250 feet, but in the sandy lands good water is obtained from wells ranging from 10 to 60 feet deep. At Boswell there are several flowing wells.

Bullock County was established in 1866 from parts of Montgomery, Pike, Macon, and Barbour Counties. The population is reported in the 1910 census as 30,196. The greater part of it is colored. The population has increased but slowly since 1870 and has decreased since 1900, when it was reported as 31,944.

This is almost exclusively an agricultural county, and the urban population is very small. No part of the county is so thickly settled that the land is cultivated to its full capacity, and there are large areas of good agricultural land which await settlement and development.

In the best-farmed sections, particularly in the southern part of the county, the farm improvements are good. Where the land is held in large tracts the owners generally live in the towns and the farm buildings of the tenants are not in good condition.

Union Springs, the county seat, is situated a few miles north of the center of the county. It is a modern town of about 4,000 population. Midway, with a population of about 500, is the next largest

town. Fitzpatrick and Thompson are towns of local importance. A number of smaller towns and post offices are distributed throughout the county.

Bullock County is well supplied with railroads. The Seaboard Air Line Railway crosses the northern part and the Birmingham & Southeastern extends northward from Union Springs, connecting with the Seaboard Air Line and the Western Railway of Alabama. The Central of Georgia Railway crosses the county with two main lines, having a junction at Union Springs. No part of the county is more than 12 miles from a shipping point, and good transportation is afforded to Montgomery, Atlanta, and northern points.

All public roads are systematically worked and are kept in unusually good condition. Unimproved roads in the region of the Norfolk sands are usually heavy and roads in the clay regions become miry in winter. During dry periods these clay roads are smooth and hard.

The county is well supplied with schools. According to the census Bullock County ranks sixth among the counties of the State in educational facilities. Compulsory medical and dental inspection is a feature of all town schools.

Rural telephones are not in general use. The rural delivery of mail reaches all parts of the county.

CLIMATE.

The climate of Bullock County is mild and equable and free from sudden extremes in temperature. It is without marked local modification by unusual altitudes or other physiographic features. The Gulf of Mexico, about 120 miles to the south, doubtless has some influence upon the temperatures, particularly during the winter. Extremes of 6° F. below zero and 105° F. above have been recorded, but these are rare. The average temperature for the spring and fall months and for the year is about 65° F. For the summer months it is about 81° F. and for the winter about 47° F. There is very little freezing weather, the ground seldom remaining frozen for an entire day. Flurries of snow occur at times during the winter, but snowfalls of even 2 to 4 inches are extremely rare. High winds are unusual and tornadoes are unknown.

The mean annual precipitation of about 54 inches is well distributed throughout the year. It is somewhat heavier than is necessary for profitable crop production. Crop failures because of dry seasons are unknown. Cotton yields are heavier during the drier years. The precipitation is lightest during the fall months, averaging about 9 inches. This condition is favorable to the harvesting of crops. The greater part of the cotton is gathered during October, which is normally one of the driest months. The precipitation is

heaviest during the winter months and frequently causes destructive erosion, since the soils of the county, consisting mainly of heavy clays or sandy loams with impervious subsoils, favor rapid run-off, wash easily, and are unprotected by cover crops during the greater part of the year. Thundershowers are frequent during the spring and summer months.

There is a normal growing season of about 240 days. The average date of the latest killing frost in the spring, according to the records of the Weather Bureau station at Union Springs, is March 9, and of the earliest in the fall, November 18. The latest date of killing frost in the spring recorded at this station is March 29, and the earliest in the fall October 25. Crops are seldom damaged by frost. The long growing season permits two plantings of Irish potatoes and other quick-maturing crops. Hardy winter vegetables are grown in home and truck gardens near Union Springs throughout the winter.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded at Union Springs:

Normal monthly, seasonal, and annual temperature and precipitation at Union Springs.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	47.7	79	10	4.92	0.50	7.35
January.....	45.8	77	10	4.56	8.39	4.10
February.....	48.3	79	- 6	7.14	3.62	15.40
Winter.....	47.3			16.62	12.51	26.85
March.....	57.6	87	21	6.44	2.18	10.82
April.....	64.8	96	33	3.84	4.27	1.62
May.....	73.5	99	41	3.87	1.23	4.30
Spring.....	65.3			14.15	7.68	16.74
June.....	80.3	103	52	3.93	3.42	3.62
July.....	81.3	105	61	5.32	2.46	4.80
August.....	80.7	102	61	4.96	3.01	1.90
Summer.....	80.8			14.21	8.89	10.32
September.....	75.7	96	45	2.93	2.53	2.06
October.....	64.6	94	31	3.06	.27	8.65
November.....	55.1	82	24	3.41	6.83	2.55
Fall.....	65.1			9.40	9.63	13.26
Year.....	64.6	105	- 6	54.38	38.71	67.17

AGRICULTURE.

Since the earliest history of the county cotton has been the principal crop, all other crops receiving comparatively little attention. A number of large cotton plantations were being operated successfully, particularly in the vicinity of Peachburg, at the time of the Civil War, when the agricultural progress of the county was temporarily arrested. After the war agriculture slowly revived, and the plantation system which formerly prevailed was resumed.

Cotton is the money crop of the county. The census of 1910 reports a production of 21,446 bales from a total of 107,099 acres in 1909. The average production for the past decade, however, has been about 28,000 bales. In general, the average yield is low, being about one-fourth bale per acre. In a very few cases yields of 1 bale or more per acre are reported. Farmers as a rule center attention upon the production of cotton, other lines of agriculture being neglected. Fairly profitable returns are easily obtained from a larger part of the soils of the county. The low average yield obtained at present is due to a number of causes, such as the use of poorly drained land, the growing of the crop on soils which are improperly prepared and deficient in organic matter, the failure to fertilize the crop properly, and the lack of care in selecting varieties.

The best cotton soils of this county, according to the results as at present obtained, are the Orangeburg sandy loam and fine sandy loam, Ruston sandy loam and fine sandy loam, Oktibbeha fine sandy loam and clay, Kalmia fine sandy loam, Leaf fine sandy loam, Susquehanna fine sandy loam, and the Houston clay. There are other good cotton soils, but their acreage is comparatively small. Much of the better drained bottom land gives good yields, but there is much under cultivation in which the drainage is inadequate for best results with this crop. Under boll-weevil conditions, when an early crop is desired, the heavy soils, particularly the clays and the wet and heavy bottom soils, are far less suitable for cotton than the warmer natured, earlier sandy lands. This has been the invariable experience throughout the boll-weevil infested section to the west and southwest.

It is generally recognized that certain varieties of cotton do best on particular soils. The Covington-Toole variety is known to do better on dry sandy soils than the other common varieties. Big-boll varieties apparently do better on the moist bottom soils. Owing to the wide diversity of soils in this county, the selection and development of strains of cotton especially suited to the various types is important.

The boll weevil has done considerable damage to cotton in the county, particularly on soils other than the sandy types. Land

that produces late cotton, which is most subject to injury by the weevil, is best used for other crops, such as corn, grass, cowpeas, etc., and for stock farming. Corn is grown only for home use. It is estimated that about three-fourths of the quantity of corn consumed locally is produced within the county, the remainder being shipped in. Sufficient corn to supply local needs can be easily grown at home. Even on the present acreage basis much more nearly the amount required could be harvested, as the soils are capable of producing far larger yields than are commonly obtained.

The 1910 census reports a production of 343,960 bushels from 53,364 acres. The present average yield for the county is about 10 to 12 bushels per acre. On the present acreage devoted to corn an increase of 4 bushels per acre would make the county self-sustaining. The principal causes of the low yields are poor preparation of the soil, improper cultivation, the use of wet and impoverished lands, failure to manure or fertilize properly, and the use of inferior seed or seed of inferior varieties.

There is a large acreage of good corn land in the county, but the stream-bottom types are in need of drainage, and the upland and second-terrace sandy soils are in need of humus. The most extensive corn soils of the county are the Ocklocknee, Trinity, and Hannahatchee soils, when properly drained, and the Houston and Oktibeha soils, the sandy loams and fine sandy loams of the Orangeburg and Ruston series, and the Kalmia fine sandy loam.

Oats are not an important crop and are usually grown in small fields. The yields are low, owing largely to indifferent methods of cultivation, but partly to rust and smut. Oats can be grown to good advantage as a winter cover or spring grazing crop and for feed. Soils like the Orangeburg, Ruston, Kalmia, Leaf, and Susquehanna fine sandy loams and the better-drained bottom-land types, such as the Ocklocknee and Hannahatchee fine sandy loams and the Trinity clay, give good yields of oats where thoroughly plowed and harrowed before seeding and fertilized moderately in case of the upland and recently formed sandy types in the bottom lands. The crop fits nicely into a number of good rotations, and it can be used to advantage as a soil binder on slopes inclined to wash during the winter. The 1910 census reports a yield of 50,864 bushels of oats from 3,971 acres.

Rye is grown only in occasional patches. It succeeds on well-drained sandy soils, and is an excellent winter cover and spring feed crop.

A large number of forage crops and grasses can be grown successfully on both the well-drained and poorly drained soils. These are mainly Bermuda grass, Johnson grass, lespedeza, melilotus, sorghum, cowpeas, velvet beans, bur clover, soy beans, crab grass,

crowfoot grass, and carpet grass, with a number of other native grasses. Cowpeas, velvet beans, soy beans, and sorghum do best on the well-drained soils and many of the bottom lands which have fairly good drainage. Bermuda grass and lespedeza afford good grazing and hay from both the well-drained and poorly drained soils throughout the county. Melilotus does best on lime soils, such as the Houston and limy areas of the Oktibbeha and Susquehanna soils. The Houston and Trinity clays produce alfalfa where good drainage is provided to a depth of 3 or 4 feet and thorough preparation of the soil is given, following destruction of such grasses as have a tendency to crowd out this crop, by clean cultivation. Johnson grass produces heavy yields on the Trinity, Houston, and Oktibbeha soils, and does well on the better drained bottom lands as well as on that part of the Susquehanna having a yellowish limy substratum. Crowfoot and crab grass grow naturally after the removal of early crops and afford fairly good hay. The legumes fit well into a number of good rotations and not only increase the productiveness of the land by adding nitrogen and humus, but afford good grazing and good hay. The large acreage in this county adapted to forage crops favors an extension of the stock-raising industry.

Peanuts are grown in a small way on most farms, mainly as a field forage crop for hogs. They do well in areas of well-drained soil in which the clay subsoil is not too close to the surface and not too deep, as the Ruston, Orangeburg, and Kalmia fine sandy loams. The crop adds nitrogen and humus to the soil, the tops yield about one-half ton of good hay per acre, and the nuts afford nutritious forage for hogs. The peanuts are grown in rows either alone or with corn. They require about the same cultivation as corn.

Either sugar cane or sorghum is grown on nearly every farm and used in the manufacture of sirup. Generally the moist soils, as in swales and on stream bottoms, are selected for these crops, and heavy yields are obtained with proper treatment and fertilization. Where well manured these crops are successfully grown on the well-drained soils, such as the Norfolk, Orangeburg, Ruston, and Kalmia fine sandy loams and the Orangeburg and Ruston sandy loams, and even on the sandy types. The color and flavor of the product are always better on the sandy soils having yellowish friable subsoils than where deep-red, plastic clay is encountered near the surface. The yields of sirup range from 150 to 300 gallons or more per acre. While little of the product is sold outside of the county, as good sirup for market can be grown here as in those sections where the industry is established on a commercial basis.

All the well-drained sandy soils of the county are capable of producing good yields of a large variety of vegetables. Not enough

vegetables are grown, however, to supply the local demand, large quantities being shipped into the county. Vegetables are grown only for home use. Some potatoes are sold at local markets. Sweet potatoes do particularly well on the sandy, well-drained soils. The canning of tomatoes for market is receiving some attention.

Among the vegetables grown in home gardens are cabbage, collards, beets, lettuce, turnips, onions, cucumbers, squash, mustard, snap beans, English peas, okra, radishes, peppers, and Irish potatoes. Egg plant, spinach, cauliflower, parsley, and other vegetables can be grown successfully. Some of these crops, such as collards, cabbage, lettuce, turnips, onions, and mustard, can be grown throughout the average winter.

Strawberries are grown to some extent. Some of the fruit is sold at local markets, mainly Union Springs. The Orangeburg, Susquehanna, Ruston, and Kalmia fine sandy loams and the Orangeburg and Ruston sandy loams give good results with strawberries. Blackberries and dewberries do well on all the well-drained soils, and the production of these fruits in large quantities requires but little effort.

A number of tree fruits do well in Bullock County, although, except in a large orchard near Peachburg, fruit is not grown commercially. Many farmers have a few peach, summer apple, fig, and pear trees, and often Scuppernong grapevines to supply fruit for home use. Wild plums and wild grapes flourish throughout the county.

Among the varieties of peaches grown successfully in the one existing commercial orchard are the Mayflower, Carman, Belle of Georgia, and Elberta. Fertilizers, including a large proportion, about 15 per cent, of potash, have been used in this orchard and clean cultivation is practiced.

At present it is difficult to market fruit and truck crops profitably, when grown in small quantities, although the canning of vegetables and fruit for market, even from small plantings, is a growing industry.

Pecan trees of the paper-shell varieties are being set by many farmers throughout the county. Although this industry is largely in its infancy, the results already obtained from mature trees indicate the possibility of the successful production of nuts of good quality. Bullock County now ranks sixth among the counties of the State in pecan production. The well-drained sandy lands not having too dense a subsoil, yet not too droughty, are used for pecans with good results in various sections of the South.

Stock raising is not of great importance in the county, but increased interest is being taken in this branch of agriculture as the attention of farmers is diverted from cotton raising because of the boll-weevil invasion. The value of live stock is reported in the 1910 census as \$1,035,387. With a large number of forage crops and

grasses doing well on soils of very moderate price, a long summer season, and mild winters the general conditions in Bullock County are favorable to stock raising. Green forage is available throughout the entire year and hay is easily produced from grasses, legumes, and grains. An additional advantage is the abundance of cottonseed products at hand. Dipping must be practiced to control the cattle tick.

Cattle have been kept on the larger farms since the early settlement of the county to supply milk and beef products. There are an increasing number of large herds of beef cattle, and a part of the beef sold at local markets is produced within the county.

There are two dairy farms in the county on which registered Jersey and Holstein cows are kept. The dairies are operated successfully, one of them having been established for a number of years. The cows are grazed principally on Bermuda grass and bur clover.

Hogs are fattened at a very low cost. They feed on peanuts, Bermuda grass, sorghum, and other forage crops, and but little corn is required in preparing them for market. Enough hogs are raised in the county to supply about one-half of the local demand for pork and pork products.

A few mules and horses are raised locally, but the farms are largely supplied from outside the State, large numbers of mules being shipped into the county.

Little attention is paid to the rotation of crops in this general region, aside from the rather irregular changing of small fields occasionally from cotton to corn or oats and the growing of peanuts and cowpeas with corn. As a result of long-continued cultivation to cotton and corn without the restoration of vegetable matter, the soils, which originally were low in organic matter, have in many fields become deficient in humus. It is generally recognized by both the farmers and agricultural investigators that throughout this region one of the most pressing needs of the soils generally is vegetable matter, and that this can be supplied to advantage by growing leguminous crops in rotation with the clean-cultivated crops. The best crops for this purpose are velvet beans, vetch, cowpeas, bur clover, lespedeza, and soy beans. Oats and rye are also used with good results. Some of these can be plowed under profitably on lands which have been cropped continuously for long periods. The legumes, in addition to furnishing needed vegetable matter, supply nitrogen. Many variations can be included in good rotations, the principal requisite being that humus-supplying crops are grown with or after the clean-cultivated crops at sufficient intervals to maintain a favorable humus supply in the soil. The soils of Bullock County are sufficiently varied in character and crop adaptation to support a far more diversified type of agriculture than is now practiced.

The total annual expenditure in Bullock County for fertilizers is approximately \$150,000, and the amount is increasing from year to year. Probably three-fourths of the fertilizer used is applied to the cotton crop, the remainder being used largely for corn and sugar cane. The general practice is to fertilize cotton in about the same way on all the sandy soils. The acreage application varies ordinarily from about 200 to 400 pounds, and the usual mixture is one analyzing about 10 per cent phosphoric acid, 1.65 per cent nitrogen, and 2 per cent potash. Recently farmers are paying more attention to the analysis of fertilizers, and are varying the mixtures more in accordance with their ideas of the special requirement of their different soils. Unfortunately very little is known with respect to the specific fertilizer requirements of soils.

Fertilizers are usually applied and covered about 10 days before the crop is planted. Some farmers make a second or "side" application, usually in June, for cotton and sugar cane. Sodium nitrate is coming into favor as a side application for corn, cotton, and sugar cane and as a top dressing for oats.

It is generally recognized that in farm practice throughout the county cultivation is too shallow, yet little effort is made to increase the depth of plowing. In many cases in preparing fields for crops the land is plowed to a depth of only 2 to 4 inches, and subsequently cultivated to greater depths. On most of the soils of the county, in order to secure the best results with crops, it is necessary to plow to depths of at least 6 to 10 inches, and in cultivating the growing crop to stir to a depth of only 2 or 3 inches, especially after the plant roots have advanced between the rows. It is recognized as good practice to plow in the fall, so that the upturned material may be exposed to the beneficial effects of frosts and freezing.

Large areas have been ruined or seriously damaged by erosion, resulting from the cultivation of steep slopes. The degree of slope which can be safely cultivated depends upon the character of the soil. Much steeper slopes of deep sandy soils, such as the sandy types of the Norfolk series, can be cultivated without attendant danger of severe erosion than of such soils as the Orangeburg sandy loam and fine sandy loam and the Susquehanna fine sandy loam. These Orangeburg and Susquehanna types gully at a rapid rate, and any slope steep enough to permit washing is best used for forestry or seeded to soil-binding crops, such as Bermuda grass. The gentler slopes can be cultivated without danger of erosion by practicing contour cultivation or terracing, but the steeper slopes of such readily washed soils as the Orangeburg fine sandy loam can not be protected even by such methods. The wash from steep slopes under cultivation during heavy rains frequently spreads damaging sand deposits over productive bottoms. In general, the damage from erosion is greatly

lessened by increasing the humus content of the soil, deep plowing, and other methods which render the soils more absorptive and retentive of moisture. Extensive erosion occurs during the winter, and the growing of winter cover crops is beneficial in protecting the fields from such injury.¹

A large total area of productive land in Bullock County is in need of artificial drainage and protection from overflow. Practically all of the stream bottoms or first bottoms comprise good corn, grass, and forage-crop soils, but are subject to such frequent overflow that their use for these crops is sometimes unprofitable. The bottom lands can be reclaimed only by diking and straightening and deepening the stream channels. They can not be reclaimed economically by individual farmers, except in the case of some of the smaller stream bottoms. A large part of the bottom land, however, is valuable as grazing land and for the production of hay where cleared and ditched sufficiently to remove surplus water quickly after floods.

A large part of the soils of the second bottoms, particularly the Kalmia fine sandy loam, is also in need of drainage. In the case of these soils it is usually necessary only to construct open ditches or tile drains and their reclamation can be accomplished by individual landowners.

The average land holding is very large, the larger estates ranging from about 1,000 to 12,000 acres. The 1910 census reports a total of 297,384 acres in farms, with 220,247 acres improved. There is a large area which awaits clearing and drainage to be made available for agriculture.

The farm labor in Bullock County consists almost exclusively of negroes, unskilled in the use of any but the simplest farm machinery. Laborers are commonly employed by the year. They are paid \$10 to \$15 per month, with cabin, pasturage for stock, firewood, and a stipulated quantity of staple provisions. Day laborers are paid from 60 cents for ordinary farm work to \$1 during the cotton-picking season. Negro women employed in the fields receive 40 to 60 cents per day and from 50 to 75 cents per hundred pounds for cotton picking.

Much of the labor of agriculture is done by tenants. Two systems of renting land to tenants are commonly practiced. Under one system the tenant furnishes teams and tools and pays for half of the seed and fertilizer. This method obtains where the tenants do not require close daily supervision and where the owner is unable to "overlook" the land several times each week. Under the other system a "one-mule" farm, consisting of from 20 to 30 acres, is rented for a definite quantity of cotton, usually 2 bales. Farming land is

¹ Bul. No. 71, Bureau of Soils, U. S. Dept. of Agr.

rarely rented for cash. A common practice among the owners of estates of several thousand acres is to subrent to operators who exercise direct supervision and control over the farming.

SOILS.

The soils of Bullock County may be broadly grouped into upland soils derived from lime-bearing rocks, upland soils derived from unconsolidated sandy deposits of a later age, second-terrace soils owing their origin to rather recent stream action, and first-bottom soils subject to annual inundation and still in active process of formation.

The oldest geological formations¹ encountered in the county are the Selma chalk, outcropping in the northwest section of the county, and the Ripley marls, next in age, which at depths varying from a few to many feet underlie the remainder of the county.

Immediately overlying the Ripley formation is a reddish, friable, sandy clay ranging from 15 to 30 feet in depth in the northern part of the county to somewhat deeper near the southern boundary. The topmost portion of this sandy formation consists of a gray or very pale yellow sand. There is some evidence that this is a younger formation than the red sandy clay, but by many it is considered of the same age.

It is believed that the greater part of the Houston soil is derived from the Selma chalk, although detached outliers without doubt owe their origin to the Ripley formation. The Oktibbeha and Susequahanna series with certain contiguous areas of the Ruston are derived in large part from the Ripley. The soils of these series prevail north of the Chunnuggee Ridge, where erosion has been active in removing the surface sandy mantle of Lafayette materials. With the exception of the Houston series, the soils derived from the limy formations usually have red, heavy clay subsoils, very often mottled with shades of yellow or gray, according to degree of drainage. Plasticity is likewise a prominent and constant feature. On the other hand, while the subsoils of the younger sandy clay formation may correspond closely in color, they invariably consist of a coarser textured, grainy, sandy clay which is usually friable and seldom markedly plastic.

The uppermost portion or gray sand phase of the red sandy clay is found in large bodies and as detached outliers capping the tops of hills that have thus far resisted erosion. It is found throughout the Chunnuggee Ridge and to the south of Aberfoil, Inverness, Midway, Pine Grove, and in the southern part of the county. It gives rise to the sands of the Norfolk series. Where streams have cut

¹An examination of the rocks and the derived soils of the county was made during the survey by Dr. E. A. Smith, State geologist, in company with the soil survey party. Statements in this report concerning geology were obtained from Dr. Smith, and from his book on the Geology of the Coastal Plain of Alabama.

through the top stratum the underlying red, friable, sandy clay may be seen, and in the deeper cuts the red, plastic clays of limestone origin. It is believed by some that this gray sand was once red, but that leaching and weathering have resulted in its present whitish or pale-yellowish color. On the other hand, where the heavier subsoils have permitted only a moderate degree of drainage and leaching, the formation may have either the yellow color of the Norfolk, the yellowish red of the Ruston, the red of the Orangeburg, or the deep brick red of the Greenville series.

The above formations, which form the uplands, give rise to 73.1 per cent of the soils of the county. The alluvial terrace soils cover 12 per cent and the first-bottom series 14.9 per cent. The first bottoms are normally overflowed one or more times annually, while the second-terrace areas, commonly known as the "second bottoms," or as "sandy hammock" land, are seldom, if ever, overflowed, except in the lowest places.

The first-bottom soils have been classified in the Trinity, Thompson, Ocklocknee, Hannahatchee, and Bibb series, and Meadow.

Owing to the irregular topography and lack of protective covering, erosion is universally active. In consequence of this not only are the upland soils decreasing in depth to such a degree that "gall spots" are numerous and fresh subsoil must annually be plowed up to replace the lost soil, but this eroded material often covers the lowlands to such a depth that more productive bottom soils are greatly damaged.

Between the overflow bottoms and the uplands the striplike terrace soils of the larger streams are developed. These nearly level terraces represent the former flood plains of the streams, and the soil material was deposited by the flood waters when the streams flowed at a higher level. The second bottoms now stand, as a rule, slightly above overflow.

The light sandy types of the terraces along Indian Creek and other large creeks and of the Pea and Conecuh Rivers are very similar to the Norfolk soils of the upland, but differ in the nature of their origin and in possessing a more abundant water supply and being for these and other reasons more productive, they are classed with the Kalmia series.

Where the drainage is less well established and the subsurface material and subsoil are very mottled the soils are mapped as the Myatt. The Leaf soils are to all surface appearances identical with the Kalmia, but the subsoil has, as a rule, many of the characteristics of the upland Susquehanna soils. It is evident that the subsoil consists of Susquehanna material derived from the adjoining slopes, upon which the alluvial materials resembling the Kalmia were later deposited.

Thirty-two soil types, excluding Meadow, are recognized in the county. These are grouped in 17 series. It is frequently difficult to determine definitely the dividing line between closely related types, as, for example, between the Ruston sandy loam and the Orangeburg sandy loam, so that the soil boundaries shown on the map are sometimes more or less arbitrarily placed. Local patches occur in many soil types as mapped which may differ in minor details from the soil as typically developed. These phases of the typical soil are due to local modifying influences, such as erosion, imperfect drainage, colluvial washing, differences in elevation, or the accumulation of organic matter in moist areas. The most important of these variations are discussed in the detailed description of the soil types.

The following table gives the relative and actual extent of the various soils mapped in Bullock County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Susquehanna clay	54,208	13.9	Meadow	6,592	1.7
Susquehanna fine sandy loam ..	44,544	11.5	Kalmia fine sand	6,144	1.6
Norfolk fine sand	36,672	9.4	Susquehanna stony sandy loam	5,184	1.3
Kalmia fine sandy loam	31,040	8.0	Orangeburg sandy loam	4,672	1.2
Ruston fine sandy loam	30,208	7.8	Greenville gravelly sandy loam	4,288	1.1
Oktibbeha clay	23,808	6.1	Ocklocknee loam	3,520	.9
Norfolk sand	21,440	5.5	Myatt fine sandy loam	2,304	.6
Houston clay	2,112	3.3	Ocklocknee clay	2,304	.6
Colluvial phase	1,408		Plummer fine sandy loam	2,240	.6
Eroded phase	9,280		Hannahatchee loam	1,984	.5
Trinity clay	11,584	3.0	Bibb silty clay loam	1,472	.4
Hannahatchee fine sandy loam ..	11,328	2.9	Bibb fine sandy loam	1,216	.3
Ruston sandy loam	10,048	2.6	Norfolk fine sandy loam	576	.1
Oktibbeha fine sandy loam	9,728	2.5	Portsmouth fine sandy loam ..	448	.1
Thompson sand	9,216	2.4	Kalmia silt loam	192	.1
Ocklocknee fine sandy loam	8,576	2.2			
Norfolk coarse sand	8,512	2.2	Total	388,480
Orangeburg fine sandy loam	8,448	2.2			
Ruston gravelly sandy loam	6,592	1.7			
Leaf fine sandy loam	6,592	1.7			

NORFOLK SERIES.

The surface soils of the Norfolk series are prevailingly gray, ranging from light gray to grayish yellow. The subsoils are yellow, and have a friable structure. These soils occupy nearly level to rolling uplands throughout the Coastal Plain. They are derived from unconsolidated deposits of sands and clays. The Norfolk series is represented in Bullock County by four types—the coarse sand, sand, fine sand, and fine sandy loam. They cover more than one-sixth of the county.

NORFOLK COARSE SAND.

The Norfolk coarse sand is a gray loose coarse sand which grades at a depth of about 6 to 8 inches into pale-yellow coarse sand.

The type occupies undulating and rolling areas in the higher uplands; drainage is excessive, and in its natural condition this is a soil of low productiveness. For good yields of any crop heavy applications of fertilizers or barnyard manure are necessary. The land is easily improved by plowing under cowpeas or similar crops to supply needed vegetable matter and to add nitrogen. This soil is best suited to the production of such crops as watermelons and sweet potatoes. It is used, however, where cultivated, chiefly for cotton and to some extent for corn. The yields with the same treatment average somewhat lower than on the Norfolk sand or fine sand.

The principal areas of this type are the strip extending from High Ridge westward to the Montgomery County line along the Pike County border, the area southwest of Enon, and the body extending east of Midway. The strip west of High Ridge is extensively farmed. With the liberal use of commercial fertilizers, mainly those analyzing 10-2-2 and home mixtures of cottonseed meal, potash, salts, and acid phosphate, fair yields are obtained.

NORFOLK SAND.

The Norfolk sand is identical with the Norfolk fine sand in all important features, with the exception of its coarser texture and consequent looser structure. In undisturbed areas it consists of a gray loose sand, underlain at about 5 or 6 inches by a pale-yellow to yellowish-gray sand which extends to a depth of 3 feet or more.

The type occupies rolling uplands through which streams have cut deep local valleys. Most of the land is topographically well suited to cultivation. The principal areas are near Almeria, Peachburg, Enon, and Midway.

This, like the Norfolk coarse sand, is a loose, leachy, droughty soil of very low natural productiveness. A large part of it is uncultivated, being forested with pine and scrub oak. Where cultivated it is used principally for cotton and corn. A large acreage in the vicinity of Peachburg is devoted to peaches.

All crops give low yields unless liberally fertilized or manured. The organic-matter content of the soil is low. This can easily be supplied by plowing under such crops as cowpeas, by growing velvet beans, and by applying manure. Vegetables, melons, sweet potatoes, and Irish potatoes do particularly well on the Norfolk sand when properly fertilized. It is a warm-natured and extremely friable soil, favorable to the early maturity and development of root crops and vegetables. The value of this type as a trucking soil depends mainly

upon transportation facilities and markets, the latter not being at present systematically developed. The type is largely used for pasturage. It is valued at about \$6 to \$10 an acre.

NORFOLK FINE SAND.

The Norfolk fine sand, as it occurs in areas which have not recently been disturbed by the plow, consists of a gray loose fine sand, underlain at about 5 or 6 inches by a pale-yellow fine sand, which extends to a depth of 3 feet or more. In cultivated fields the color of the material at the immediate surface is usually tinged with yellow, owing to the intermingling of the yellowish subsoil material with the original gray surface soil. In some of the more nearly level areas and on some of the lower slopes the subsoil, especially at greater depths, is yellowish gray or very light gray.

The type mainly occupies hills, ridges, and slopes of a fairly steep gradient. It occupies a very large area in the southern part of the county in the vicinity of and between the Conecuh and Pea Rivers. One large area extends along the high Chunnenugee Ridge from the vicinity of Union Springs eastward.

This soil, on account of its open nature, does not retain moisture well, except where a sufficient supply of organic matter is maintained in the surface soil to impart a loamy character and where frequent shallow cultivation is practiced. This type is naturally best adapted to vegetables. Such crops as sweet potatoes, Irish potatoes, and melons do particularly well. The soil is most extensively used, however, for the production of cotton, corn, oats, and peaches. Liberal applications of commercial fertilizers are necessary for the best yields of any crop. Although peaches are successfully grown in the vicinity of Peachburg, it is recognized that the type is not so well adapted to this fruit as the Orangeburg soils, the trees being noticeably smaller in size and the fruit not being as highly colored as that produced on the Orangeburg sandy and fine sandy loams. For canning purposes, however, where the color of the skin is of no particular advantage, the fruit is satisfactory.

The leguminous forage crops, peanuts, velvet beans, vetch, and bur and crimson clover, while not grown extensively on this soil, are well adapted to it and are advantageous in supplying organic matter and nitrogen to the soil.

NORFOLK FINE SANDY LOAM.

The soil of the Norfolk fine sandy loam is a gray fine sand, underlain at about 5 to 8 inches by a pale-yellow loamy fine sand which usually grades below into yellow, friable fine sandy loam. The subsoil, beginning abruptly at about 12 to 24 inches, is a yellow, friable

fine sandy clay. A deep phase of this type occurs in many places where the subsoil is not reached at less depths than about 24 to 36 inches.

The principal areas of this type are between Pine Grove and Midway. The total extent of the type is very small.

The soil holds moisture better and is more durable than the sand or fine sand members of the series. While it is necessary to maintain a good supply of organic matter and to apply moderately heavy amounts of commercial fertilizers in order to secure best yields, less of such manuring is required than for the sand members of the Norfolk series.

In addition to its adaptation to vegetables, potatoes, and melons, the general farm crops of the region, cotton, corn, oats, cowpeas, and sugar cane, give good returns with proper fertilization. Where the organic content is sufficient to impart a slight degree of loaminess to the soil, moderate applications of a fertilizer mixture analyzing about 8 per cent phosphoric acid, 3 or 4 per cent nitrogen, and 4 to 5 or 6 per cent potash is effective in producing yields of one-half to 1 bale of cotton, 30 bushels or more of corn, and 30 to 40 bushels of oats per acre. Cotton is the chief crop. It is grown in the same manner as on other soils, with the same general fertilizer treatment, and yields about one-fifth to one-third or one-half bale per acre, according to treatment.

ORANGEBURG SERIES.

The Orangeburg soils are predominantly gray, ranging to reddish brown. The soils are open structured, and the subsoils consist of friable red sandy clay. This series is confined to the uplands of the Coastal Plain, being most extensively developed in a belt reaching from southern North Carolina to Central Texas. The soils, like the Norfolk soils, are derived from unconsolidated sands and clays. Two types of the Orangeburg series are recognized in Bullock County—the Orangeburg sandy loam and the Orangeburg fine sandy loam.

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam is practically identical with the Orangeburg fine sandy loam, except that it has a coarser texture. It consists of grayish loamy sand to grayish-brown sandy loam, underlain at about 8 to 15 inches by red, friable sandy clay. Frequently there is a thin subsurface layer of yellowish to light-reddish sandy loam.

The most important areas of this type occur west of Enon, in the vicinity of Midway, and north of Smut Eye. The topography is generally somewhat rougher than that of the Orangeburg fine sandy

loam, being mainly rolling, with considerable gullying on the slopes. The greater part of the type can be cultivated, but some of the more severely eroded areas are best utilized for pasturage or forestry. Cotton, corn, oats, cowpeas, peanuts, velvet beans, lespedeza, Bermuda grass, peaches, sweet potatoes, and vegetables do well. Peaches, pecans, and pears, such as the Kieffer and Garber, do well on this land, although the commercial production of pears is not at present highly satisfactory, because of the ravages of the fire blight, for which pruning seems the only remedy. Moderate applications of commercial fertilizers are commonly made for all important crops. Most of the crops grown need such applications where barnyard manure is not available, in order to give best yields. With a good supply of humus, such as is obtained by growing such crops as cowpeas and rye to plow under, or velvet beans for grazing, the fertilizers are most effective on this type, as on all of the well-drained sandy soils of the general region.

ORANGEBURG FINE SANDY LOAM.

In its typical development the Orangeburg fine sandy loam consists of a gray fine sand or loamy fine sand, underlain at about 6 to 8 inches by yellowish or reddish fine loamy sand or fine sandy loam, which passes at about 10 to 24 inches into red, friable sandy clay. In places, as near the Barbour County line in the southeastern corner of the county, the subsoil is rather tough and compact, although it consists of fine sandy clay. Some areas of this tough subsoil phase grade within the 3-foot section into mottled Susquehanna material, representing inclusions of Susquehanna fine sandy loam not of sufficient size to map.

Large areas of the Orangeburg fine sandy loam occur between Union Springs and Enon, in the southeastern corner of the county, and in the vicinity of Inverness. The type has a rolling to hilly topography, and occupies the slopes of ridges and hills. Some of the steeper slopes are locally washed or gullied to the extent of removing the surface sandy layer and exposing the raw or fresh red clay of the subsoil.

This soil is well suited to the production of cotton, corn, cowpeas, velvet beans, vetch, crimson clover, and bur clover. With an equal application of a good commercial fertilizer mixture and the same treatment with respect to plowing and the addition of vegetable matter, heavier yields are obtained on this type than on the Norfolk fine sandy loam. As compared with the Norfolk fine sandy loam, however, the type has the disadvantage of being more susceptible to erosion. Sweet potatoes, Irish potatoes, peaches, pecans, and a large variety of vegetables do well.

While most of the type is cultivable, the steeper slopes which show a readiness to wash badly are best left forested, or possibly used for seeding to soil-binding grasses, such as Bermuda grass. This soil washes so easily that the greatest care must be exercised to prevent or check erosion, so that it is generally necessary for the slopes to be terraced and cultivated along contour lines and seeded to soil-binding crops or forested. Already some of these slopes along drainage ways have been practically ruined by gullying, and there is no doubt that the destructive effects of erosion are extending.

RUSTON SERIES.

The Ruston soils are gray, ranging to grayish brown. The subsoils are reddish yellow to yellowish red or dull red, and are moderately friable, consisting generally of sandy clay. Occasionally the lower subsoils are mottled with gray and shades of yellow. This series is intermediate between the Orangeburg and Norfolk series in the color of the subsoil, and between the Orangeburg and Norfolk on the one hand and the Susquehanna on the other in point of subsoil structure. Nearly all these soils are derived from material of similar origin, namely, unconsolidated deposits of the Coastal Plain. The Ruston gravelly sandy loam, sandy loam, and fine sandy loam are encountered in Bullock County.

RUSTON GRAVELLY SANDY LOAM.

The Ruston gravelly sandy loam is a soil of characteristically rough topography, the surface being rolling and hilly, with many steep ridges, rounded hills, and rather steep slopes. Several soil types are represented in the area mapped as this type, but the prevailing soil consists of a grayish to somewhat reddish fine sandy loam or sandy loam which grades at a depth of a few inches into yellow heavier fine sandy loam or sandy loam, which in turn grades into reddish-yellow, dull-red, or mottled reddish and yellowish, moderately friable and usually compact sandy clay. Small fragments of ferruginous sandstone, like those of the Greenville gravelly sandy loam, are present on the surface and throughout the surface soil in quantities sufficient to give the soil a gravelly character. These fragments are more abundant on the hills and ridges and eroded slopes than in the smoother areas and on the lower slopes.

There are a number of small included areas, especially on knolls, in which large, platy fragments of sandstone, similar in composition to the smaller fragments, are present in sufficient quantities to warrant the classification of such areas as the Ruston stony sandy loam. Symbols are used on the map to show where these fragments are thickest. Where the fragments are most abundant the surface soil is sometimes reddish.

The type occurs in the southern part of the county, in the vicinity of Perote, and to the west and south of this town.

Throughout this type there are small, irregularly shaped bodies of Ruston sandy loam and fine sandy loam, and of Susquehanna fine sandy loam, clay, stony sandy loam, and gravelly sandy loam, which can not be satisfactorily mapped on the scale used. Near Perote there are some inclusions of Greenville gravelly sandy loam. The variable character of this type and the presence of stones and gravel, coupled with the rough topography, give the roughest and most diverse parts of this land a close resemblance to the soils mapped in other sections of the Coastal Plain as the Guin.

The Ruston gravelly sandy loam in its roughest development is unsuitable for profitable cultivation. Some areas of the type, such as in the prevailing smoother section south of Perote, are used mainly for cotton and corn. Peanuts, cowpeas, velvet beans, and several other crops do well, but cotton is by far the most important crop. Cotton yields are good for such rough land, ranging from about one-fourth to one-half bale or more per acre. Much of the land is forested with longleaf pine and blackjack oak. Broom sedge and other native pasture plants furnish good grazing. The raising of stock is probably the most profitable type of agriculture possible on the roughest areas of this type. In cultivated areas liberal fertilization or the application of barnyard manure is essential to the production of good yields. The growing of legumes in rotation with other crops, as in the case of all the sandy upland soils of the county, markedly improves the productiveness of this type. A part of the type is well farmed.

This land is valued at about \$30 an acre for the best areas near Perote. The rougher uncultivated land has a much lower value.

RUSTON SANDY LOAM.

The Ruston sandy loam typically consists of a gray sand, passing at shallow depths into a yellowish sandy loam, which, in turn, grades at varying depths, generally not greater than about 15 to 20 inches, into reddish-yellow, dull-red, or mottled red and yellow sandy clay. The lower subsoil, especially where it has a mottled red and yellow color, is usually rather compact, like the common substratum of this type. Frequently the subsoil is somewhat plastic, approaching the character of the Susquehanna subsoil. As mapped, this type includes some Susquehanna sandy loam. Also there are included patches of Ruston gravelly sandy loam too small or irregular in distribution to be shown separately. The most important occurrence of this type is represented by the areas near Midway and in the southern part of the county bordering the Pike County line.

The topography is characteristically gently rolling to rolling. Drainage is well established. With careful treatment, including deep breaking of the land, the addition of organic matter by growing and plowing under such crops as cowpeas and by liberal fertilization or the application of barnyard manure, this land gives fair to good yields of cotton and corn. Some of it is rather too rolling or too steeply sloping for profitable cultivation. Such areas are best suited to pasturage and forestry.

The acreage valuation of this land is about the same as that of the Ruston fine sandy loam in equally favorable locations.

RUSTON FINE SANDY LOAM.

The typical Ruston fine sandy loam is a gray fine sand, underlain at about 5 inches by a yellow or pale-yellow loamy fine sand. Between 12 and 24 inches a yellowish-red to reddish-yellow, friable fine sandy clay is encountered. The fine sandy clay subsoil frequently is not reached much above a depth of 36 inches, while, on the other hand, there are included spots in which the clay lies very near the surface or is exposed. In the latter case erosion has removed the original sandy covering. Frequently the sandy clay subsoil is mottled, especially in the lower part, with shades of yellow and red and even gray, and is more or less plastic. This phase represents an approach toward the Susquehanna fine sandy loam. The type as mapped includes occasional patches of Norfolk and Orangeburg fine sandy loam and even some patches of Orangeburg clay. Small fragments and pebbles of ferruginous sandstone are present in the surface soil of some areas.

The type is extensively developed in the southern part of the county, but is inextensive north of the Chunnenugee Ridge. The topography is largely rolling. A larger percentage of this type is cultivable than of the Orangeburg fine sandy loam. All but the steeper stream slopes can be plowed without danger of serious erosion. Those slopes which show a tendency to wash are best kept forested, except where terracing or contour cultivation is practiced, or used for soil-binding crops such as Bermuda grass. A large part of the type is under cultivation, and it is generally well farmed, particularly in the southern part of the county. Forested areas support a growth of shortleaf pine and some longleaf pine.

This type has practically the same crop adaptation as the Orangeburg fine sandy loam. Its crop value in the case of the typical areas having the same depth to clay is very nearly the same as that of the Orangeburg fine sandy loam, the land usually giving slightly lower yields than the Orangeburg type. Practically the same treatment is

applicable to the two soils. The Ruston fine sandy loam, however, seems to require heavier fertilization.

The value of this land ranges from \$10 to \$20 an acre, depending on smoothness of surface, condition of the land, buildings, and location.

SUSQUEHANNA SERIES.

The Susquehanna soils are gray, ranging to reddish. The subsoils are mottled gray and red or gray, red, and yellow, and consist of plastic, heavy, clay. The color of the subsoils varies, often being red, white, drab, yellow, and sometimes purple, although red practically always predominates, the other colors appearing only as mottlings in the lower part of the section. The Susquehanna series is developed in the Coastal Plain from the vicinity of Chesapeake Bay to central Texas. Three members of this series are mapped in Bullock County, the stony sandy loam, the fine sandy loam, and the clay.

SUSQUEHANNA STONY SANDY LOAM.

The typical soil of the Susquehanna stony sandy loam is a grayish or light grayish brown fine sandy loam, carrying sufficient sandstone fragments to interfere somewhat with cultivation, and underlain at about 4 to 6 or 8 inches by red plastic clay, which frequently shows some mottling of yellow or gray, or both, in the lower subsoil. Mica flakes are noticeable in the subsoil of some areas. The rock content consists of irregular-shaped ferruginous sandstone fragments, varying in size from mere chips to plates 6 or more inches in width, and in color from reddish to yellowish.

The type as mapped includes patches in which the fragments are small enough to constitute a gravelly sandy loam and patches of Susquehanna fine sandy loam, Susquehanna clay, Ruston fine sandy loam, and Ruston gravelly sandy loam. The topography is rolling to hilly or ridgy, the knolls and ridge crests being the more stony and the slopes prevailingly freer of the sandstone fragments.

The type is largely confined to the southern part of the county and the section about Perote.

The forest growth consists of blackjack and other oaks and long-leaf pine. While cotton gives fair yields, the type is mainly best suited to pasturage and forestry. Some of the more rocky areas are difficult to cultivate, while the steeper slopes suffer from erosion where cultivated. Considerable pasturage is afforded by wild grasses.

In the vicinity of Perote this land is cultivated extensively, but elsewhere only occasional patches are farmed. Cotton is the principal crop. It does noticeably better than corn, the soil appar-

ently being too droughty for the latter crop. Cotton yields satisfactorily in the smoother fields under good management, as in the vicinity of Perote. The stone fragments apparently help to check erosion, and where not so abundant as to interfere seriously with cultivation possibly are an actual advantage.

SUSQUEHANNA FINE SANDY LOAM.

The Susquehanna fine sandy loam consists of a grayish fine sand to fine sandy loam, underlain at about 5 inches by a yellowish to reddish-yellow loamy fine sand or fine sandy loam which passes abruptly at about 6 to 12 inches into red, plastic, sticky, heavy clay mottled at lower depths with gray and yellow colors. In some areas there is a subsurface layer of yellow fine sandy loam, grading into fine sandy clay, which continues to depths greater than that of the soil of the typical areas, and reaching clay at about 12 to 30 inches. This latter phase represents a gradation between the Norfolk fine sandy loam and the typical Susquehanna fine sandy loam, and is probably a better soil than that in which the heavy clay is near enough to the surface to be reached by deep plowing. There are some included areas of Oktibbeha clay which can not be satisfactorily mapped, comprising a reddish mottled, sticky, plastic clay, which grades into yellowish or greenish-yellow, more or less calcareous, sticky, plastic clay.

This is the second most extensive soil in the county and is widely distributed. It occupies generally smoother country than the Susquehanna clay. Much of it occurs in gently sloping areas where erosion is not very active. The surface is rolling locally, but most of the type can be plowed. The steeper slopes are subject to washing, and are best kept in timber or devoted to pasturage, using soil-binding grasses.

This is a fairly good agricultural soil, capable under good management and with the application of commercial fertilizer, of producing one-half bale of cotton per acre and moderately good yields of corn, oats, and forage crops. The phase having the deeper soil is adapted to a wider range of crops and is more easily tilled, especially where deep plowing is necessary, than that having the stiff clay near the surface. Cotton is probably the most successful crop under present conditions.

Liberal treatment with commercial fertilizer is generally necessary, and is practiced by the better farmers. The application of lime is beneficial. Some attention is being given to stock raising and the peculiar adaptation of the land to such good grazing crops as lespedeza, bur clover, and broom sedge, coupled with the difficulty of handling this land makes the type well suited to this industry. Melilotus succeeds on the included areas of Oktibbeha soil. The type is

widely distributed throughout all the county, except the extreme southern part.

This land is valued at about \$10 to \$30 an acre, depending on its location, topography, and condition.

SUSQUEHANNA CLAY.

The Susquehanna clay is a dull-red to bright-red, plastic, sticky, heavy clay which shows increasing mottlings of gray and yellow with depth, the lower portion having a characteristic intensely mottled red, yellow, and gray color. In texture and structure there is no important change from the surface downward in the typical soil, but there are areas in which varying quantities of mica occur, particularly in the subsoil, giving the material a greasy feel and quite noticeable friability. Over a large part of the type there is a thin covering of fine sandy loam, ranging from 1 to 5 inches in depth. This makes it rather difficult to draw a sharp boundary between the clay and the fine sandy loam of this series, especially in the smoother areas which have not been recently plowed. On the slopes there are frequent eroded spots of clay, even where there is a sandy mantle over much of the soil, while freshly plowed areas of the sandier phase of the type show frequent slices of clay turned to the surface. The sandy covering, in other words, is prevailingly very shallow, and never, except in spots too small to map, deep enough to prevent plows from reaching down to the tough clay, where ordinarily good plowing is done. The type includes some Oktibbeha clay, especially along the stream slopes of the prairie belt. There are also some included strips of Henderson clay or fine sandy loam, derived from calcareous material, and consisting of a greenish-yellow, plastic, sticky clay. These are at present non-agricultural land.

The type occupies rolling, gently rolling, and undulating and gently sloping areas. Much of the type would be topographically adapted to cultivation if it were not for the fact that the soil is susceptible to severe erosion on the steeper slopes and even on gentle gradients. In some of the more hilly situations, as in the southwestern part of the county near the Montgomery County line, the steeper slopes have been badly washed and severely gullied. This type requires a heavy equipment of tools and stock for its proper tillage, the clay being very tenacious and difficult to break and maintain in a good condition of tilth. Cultivation is restricted to a comparatively narrow range of moisture conditions, the soil being very sticky when wet or even thoroughly moistened, and hard and intractable when dry. The greater part of the type supports a growth of pine and broom sedge and is used as grazing land. The yields of

cotton and corn, which are scatteringly grown, average low. The type is best suited to grass, such as Johnson and Bermuda grass and lespedeza, although cotton and oats give fair results where the land is carefully tilled, especially in those fields having a shallow covering of sandy material. For best results it is necessary to incorporate considerable vegetable matter with the soil and to apply lime at the rate of at least 1 ton of burnt lime or 2 tons or more of ground limestone per acre.

The Susquehanna clay is the most extensive soil encountered in Bullock County, the greater part of the type occurring in the northern and western sections. Much of this land is used for pasturage, being forested and pastured more than any of the other important soils. Many former cultivated fields have been "turned out" of cultivation and have grown up in shortleaf "old-field" pine. The type is valued at about \$5 to \$20 an acre.

PORTSMOUTH SERIES.

The Portsmouth series includes dark-gray to black soils, with light-gray or mottled gray and yellow subsoils. The soils are high in organic matter, and the heavier members are always plastic, though carrying a noticeable quantity of sand. The soils of this series are developed in flat or slightly depressed, poorly drained areas. The series is most extensively developed in the flatwoods or low seaward portion of the Coastal Plain east of the Mississippi River, though scattered areas are found also in the higher parts of the Coastal Plain country. The Portsmouth fine sandy loam is the only representative of this series in Bullock County.

PORTSMOUTH FINE SANDY LOAM.

The Portsmouth fine sandy loam is a black loamy fine sand, underlain at about 5 or 6 inches by a grayish fine sand which becomes lighter in color with depth and grades at about 18 to 30 inches into mottled yellowish and grayish fine sandy clay.

The type occurs in flat or slightly depressed, poorly drained areas on gentle slopes near streams and in flat upland areas. The chief vegetation is pine, water oak, black gum, and sweet gum, with an undergrowth of gallberry and other moisture-loving shrubs and plants. A small part of the type is under cultivation. There are some included patches of Portsmouth fine sand of too little importance to map separately. These consist of a black fine sand underlain at a depth of 6 to 8 inches by a light-gray to nearly white fine sand faintly mottled in some areas with pale yellow. The surface soil contains sufficient vegetable matter in process of decomposition to impart a loamy or mucky character. The land remains in a

permanently soggy condition, and is often decidedly miry. Its characteristic vegetation is pine and gallberry.

The Portsmouth fine sandy loam is locally known as "gallberry land." Improvement of the drainage by ditching or tiling is essential to the successful utilization of the land for crop production. With liberal application of burnt lime or ground limestone and complete mixtures of fertilizer, sugar cane and oats and corn can be grown. Such vegetables as onions, cabbage, and lettuce are grown successfully on this soil in many parts of the Atlantic and Gulf Coastal Plain.

The largest bodies of this soil are those between Aberfoil and Pine Grove and southeast of Martins Store. This is a type of little importance, both in point of extent and agricultural value.

PLUMMER SERIES.

The Plummer soils are gray. They are frequently mottled with dark brown, and are underlain at 8 to 20 inches by light-gray, compact material, more or less mottled with streaks of brown and yellow. The lower part of the subsoil usually consists of sandy clay or sticky sandy material with pockets or layers of yellowish, plastic sandy clay. The soils are derived from reworked Piedmont-Appalachian material. They are nearly always in a sticky condition, and water frequently stands on the surface after heavy rains. This series is typically developed in the flatwoods region of the Coastal Plain. In Bullock County only one member of the series is recognized, the Plummer fine sandy loam.

PLUMMER FINE SANDY LOAM.

The Plummer fine sandy loam in representative areas is a gray fine sand which quickly passes into a light-gray fine sand. This is underlain, usually at about 12 to 30 inches, by a mottled gray and yellow, friable sandy loam to slightly plastic fine sandy clay. The type occupies gentle slopes, usually adjoining stream bottoms. It remains in a wet, soggy condition throughout a large part of the year where not artificially drained. The imperfect drainage condition is largely due to seepage. This type practically coincides in character of material and drainage conditions with the Portsmouth fine sandy loam, except that the surface soil is gray instead of dark gray or black as in the case of the Portsmouth. By ditching to remove excess water and by liming, in conjunction with the liberal addition of vegetable matter and the application of complete fertilizer mixtures, the type can be successfully used for the production of corn, oats, sugar cane, sorghum, cowpeas, and velvet beans.

This soil is developed only in small areas, such as the one 4 miles south of Union Springs, the strip just east of that town, two areas south of Pickett, and several in the vicinity of Pine Grove. It is of little importance.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Plummer fine sandy loam:

Mechanical analyses of Plummer fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414055.....	Soil.....	0.2	2.8	6.0	37.5	26.2	20.0	7.2
414056.....	Subsoil.....	.2	2.2	5.0	34.4	22.8	18.8	16.5

HOUSTON SERIES.

The Houston soils are black. The subsoils where well developed are pale yellow to greenish yellow. The parent soft, chalky rock often lies less than 2 feet beneath the surface. Both the soils and subsoils are usually high in lime. The series is developed principally in the black calcareous prairie regions of Alabama, Mississippi, and Texas. The material is derived from the weathering of calcareous clays, chalk beds, and rotten limestones, all of Cretaceous age. In some localities remnants of later sandy and gravelly deposits have been mixed with the calcareous material, giving rise to the gravelly and loam members of the series. This series is represented in Bullock County by a single member, the Houston clay.

HOUSTON CLAY.

The Houston clay to an average depth of about 8 inches is a grayish-brown or dark-brown to nearly black clay, crumbly when only moderately moist and exceedingly sticky and plastic when wet. This is underlain by a plastic, sticky clay of yellowish-brown to pale-yellow or grayish yellow color. It sometimes has an olive-green cast and may contain soft, whitish limy concretions. The granular structure of the surface soil is due to the relatively high lime content.

The Houston clay usually occupies the tops of hills and ridges. It occurs in scattered areas mostly north of the Chunnuggee Ridge. It is generally bordered by the Houston clay, eroded phase, or soils of the Oktibbeha and Susquehanna series. Originally there were large tracts of this soil, but the area has been diminished by washing, which has added proportionately to the area of the Houston clay, eroded phase.

The general region in which this type is developed is known as the "prairie." The name was applied because of the nearly treeless appearance of this soil in its virgin condition. The topography varies

from undulating to rolling. Thickets of wild plum are seen; ash, hackberry, and cedar also grow scatteringly with cottonwood along the streams. Numerous hedges of bois d'arc are found along the roadsides. The type was originally covered by grasses. At present Johnson grass and large water grass have spread over large areas. Bermuda grass also does well and furnishes excellent pasturage. On this soil this grass is without doubt the best single plant for a 12 months' pasture. Melilotus is found wherever a lack of annual tillage permits its growth and seeding. Johnson grass and melilotus do better on this type than on any other soil in the area. The culture of these grasses and legumes has been found profitable where correctly handled. They fit well into good crop rotations, which are needed, particularly under boll-weevil conditions. Being so well adapted to forage crops, this land is naturally well suited to stock raising.

Wherever it occurs in Bullock County the Houston clay is known for its lasting productiveness without recourse to fertilization. Many fields have been in continuous cultivation for nearly 50 years, and are still producing profitable crops of cotton and corn. With a suitable rotation to supply needed humus the present yields could be materially increased.

Owing to the success attained in growing alfalfa on this soil in other counties in this same "black land" belt of Alabama and Mississippi, many efforts have been made in Bullock County to grow this crop. The crop has been only partly successful or a complete failure. This is probably due to a lack of proper preparation of the fields. Alfalfa requires a well-pulverized soil, free from weeds, well drained, and well limed, and inoculated with the proper bacteria. Corn and cotton are the principal crops grown. The Houston clay is valued at about \$20 to \$35 an acre.

Houston clay, eroded phase.—The Houston clay, eroded phase, is a greenish-yellow, or yellowish-brown tinted with green clay, underlain at about 4 to 8 inches by pale greenish yellow clay which is somewhat plastic to almost white clay of a rather chalky character. In many places the subsoil is a yellow or greenish-yellow plastic clay mottled with whitish chalky material. The soil and subsoil usually carry a high percentage of calcium carbonate.

The phase occupies the gentle slopes of rounded ridges and hills and rather rough areas, often too broken for practical cultivation, in the "black prairie" region of the county. This soil is clearly a product of erosion, representing former areas of Houston clay from which the darker surface layer has been removed by water action. White or yellowish calcareous concretions are usually conspicuous on the surface. There are some included spots of Oktibbeha clay.

A part of this phase is used for the production of cotton and corn. The yields are not so heavy as those produced on the Houston clay. Improvement can be brought about by deeper plowing and by growing and occasionally plowing under crops like melilotus, soy beans, vetch, and bur clover. The rougher portion is valuable only for pasturage at present. Under careful management, including a permanent sod for pasturage, a soil layer would be gradually formed, and ultimately portions of the land could be cultivated again.

The Houston clay, eroded phase, occurs in the northwestern part of the county, extending from Cubahatchee Creek westerly to the Montgomery County line. This land is valued at \$5 to \$20 an acre.

Houston clay, colluvial phase.—The Houston clay, colluvial phase, consists of black or very dark brown clay which passes at about 4 or 5 inches into dark-drab or drabbish-brown plastic clay, and this at about 10 to 15 inches grades into pale-yellow, plastic, sticky clay mottled somewhat with gray or drab. The dark surface clay extends to a depth of as much as 2 feet in places where there has been a considerable accumulation of colluvial material from adjoining slopes of Houston soils.

The phase occupies flat areas, gently sloping streamward and resembling stream terraces. It always occurs near streams. In some places it grades into the first bottoms of the streams, while in others it is separated from the stream bottoms by terrace soils such as the Myatt and Kalmia, with frequently a sudden drop through a steep slope to second bottom soils.

The material of the surface soil is largely colluvial, being washed down from adjoining areas of Houston and Oktibbeha soils, while the subsoil is apparently residual from the limestone material underlying the region of the Houston and Oktibbeha soils, although it can not be positively said that the subsoil does not consist of old alluvium. The topography indicates that the terracelike configuration is due to stream action.

In view of the fact that the surface soil is plainly largely colluvial from Houston material and the uncertainty regarding the origin of the subsoil, this development is mapped as a colluvial phase of the Houston clay. Locally this soil is known as "black prairie land."

While the subsoil is usually wet and sticky, owing to its impervious nature, the drainage of the surface soil is sufficiently good for the type to give excellent results with such crops as cotton, Johnson grass, melilotus, oats, and corn. With careful preliminary treatment alfalfa could probably be grown successfully.

OKTIBBEHA SERIES.

The Oktibbeha soils are prevailingly dull brown to yellowish brown. The subsoils consist of yellowish-brown to somewhat mottled yellow, gray, and red, rather plastic, silty clay. These soils are de-

veloped in close association with the Houston soils and have been mapped only in the "black prairie belt" of Alabama and Mississippi. They are underlain by soft rotten limestone. The topography is flat to gently sloping. The soils occur at slightly varying elevations throughout the prairie regions. Two members of this series are mapped in Bullock County—the Oktibbeha fine sandy loam and the Oktibbeha clay.

OKTIBBEHA FINE SANDY LOAM.

The soil of the Oktibbeha fine sandy loam, as mapped in this county, is a gray loamy fine sand which grades at a depth of a few inches into a yellow fine sandy loam, and this into yellow, friable, fine sandy clay. At about 10 to 12 inches mottled yellowish and reddish, somewhat plastic, fine sandy clay is encountered. This grades below into mottled red, yellow, and gray or red and gray plastic clay. Fine sand frequently is noticeable throughout the 3-foot section. Soft calcareous material is encountered in the substratum, generally at less than 10 feet from the surface, such material corresponding with the substratum of the Houston soils. In places the grayish fine sandy loam passes directly into reddish clay, which grades below into yellowish to greenish-yellow, plastic, sticky clay.

The type occurs on slight knolls or ridges in association with the Oktibbeha clay. It is a good, well-drained soil, and is adapted to cotton, sorghum, cowpeas, sweet potatoes, and peanuts.

OKTIBBEHA CLAY.

The Oktibbeha clay over large areas is a brownish-red clay which passes at about 3 to 5 inches into red, plastic, sticky clay grading below within the 3-foot section into pale-yellow or greenish-yellow sticky clay containing whitish particles of calcareous clay or rotten limestone. The subsoil in this case is practically the same as that of the Houston clay of the county, differing somewhat from the usual mottled red, yellowish, and grayish clay subsoil of the Oktibbeha clay as mapped farther west in the black prairie belt. This development of the type differs from the typical soil of other sections in having a somewhat brighter red color in the upper portion. There are many areas, however, in which the color of the surface soil is brownish red or reddish brown, like that of the typical Oktibbeha. In many places the subsoil is a mottled yellow, gray, and red, stiff, plastic clay instead of yellowish, calcareous clay. This last development is nearly identical with the Susquehanna clay, but differs from the Susquehanna in that it has a substratum within about 3 to 5 feet of the surface which consists of the calcareous clay or marly limestone underlying the "black prairie region" of this section. This calcareous substratum has influenced the greater part of the Oktibbeha clay.

The type occurs in close association with the Houston clay and occupies nearly the same topographic position. It occurs between the lower slopes adjoining the stream bottoms and the tops of the higher elevations in the gently rolling "black prairie region" and the smooth border of the region. Locally the Houston-Oktibbeha portion of the county is known as the "black prairie region" or "black-land country." Farmers, however, distinguish between the Oktibbeha clay and the Houston clay in its more typical development farther west and the former is locally known as "post-oak land" and "red prairie." The type is largely cultivable, yet some of the steeper slopes wash somewhat where not properly handled.

The Oktibbeha clay is used mainly in the production of cotton and corn. Under proper management, including deep fall breaking of the land and frequent shallow cultivation in dry seasons, good results are had without heavy applications of fertilizer. Heavy teams and implements are essential to the maintenance of a good, deep seed bed. Oats, melilotus, Johnson grass, Bermuda grass, lespeza, soy beans, bur clover, and vetch do well on this land.

The type is particularly adapted to stock raising, since it produces good forage and grass crops with a minimum expenditure of labor, and is valued at about \$20 to \$35 an acre.

GREENVILLE SERIES.

The soils of the Greenville series are prevailing red, ranging from dark red to reddish brown. These soils are closely associated with those of the Orangeburg series in distribution. The subsoils are influenced to some extent by the underlying limestone which is present in some places. The Greenville soils are generally more retentive of moisture than the Orangeburg. They occupy level to gently rolling areas in the Coastal Plain uplands. The material is sedimentary, mainly from sands and clays. Only one member of the Greenville series is recognized in this county—the Greenville gravelly sandy loam.

GREENVILLE GRAVELLY SANDY LOAM.

The areas mapped as the Greenville gravelly sandy loam comprise several soils which can not be satisfactorily separated owing to their intricate association. The dominant soil is a reddish-brown fine sandy loam, carrying a large quantity of angular fragments of reddish and yellowish ferruginous sandstone varying in size from very small to several inches in diameter, the larger fragments usually being platy. This fine sandy loam is underlain at about 4 to 8 inches by red, moderately stiff or slightly plastic, fine sandy clay, which frequently passes within the 3-foot section into more friable fine sandy clay, often faintly mottled with ochreous-yellow material. In

places the gravel content is so low that the soil would be mapped as a fine sandy loam if the areas were of sufficient size.

The typical Greenville gravelly sandy loam is confined largely to the crests or upper slopes of ridges. On the steeper eroded slopes the prevailing soil is a light-red sandy clay, corresponding with the subsoil of the gravelly sandy loam areas. This clay represents former sandy land from which the surface soil has been washed. Sandstone fragments are much less numerous on these eroded slopes.

The type occurs mainly between Boswell and Perote. The topography is characteristically rolling to hilly, the surface configuration being considerably more uneven than that of the Orangeburg fine sandy loam. The land is largely dissected by "hollows" or dry ravines developed by erosion, such areas being locally called "red gravelly land." While many of the slopes are too steep for safe cultivation, the larger part of the area included in this type can be used for cultivated crops. Considerable cotton is grown with good to fair results, depending largely on the topography. The steeper slopes are best utilized for pasturage. Bermuda grass and lespedeza make good pasturage, and broom sedge and other wild grasses afford good grazing.

LEAF SERIES.

The surface soils of the Leaf series are light gray to gray. The subsoils characteristically consist of gray or mottled gray and yellow, compact, silty clay, which grades downward into mottled red and gray or red and yellow plastic clay, through which water and air move slowly. Iron concretions are common on the surface. These soils are typically developed on stream terraces in the Coastal Plain region. The Leaf series is represented in this county by a single member—the fine sandy loam.

LEAF FINE SANDY LOAM.

The Leaf fine sandy loam consists of a gray fine sand, underlain at a depth of about 5 inches by pale-yellow loamy fine sand, which grades into a yellow fine sandy loam. At about 10 to 24 inches a mottled yellow, gray, and red plastic clay, resembling the subsoil of the Susquehanna fine sandy loam, is encountered. The surface appearance and the surface soil of this type very closely resemble that of the Kalmia fine sandy loam and it is usually necessary to examine the subsoil before the type can be identified. There are places where the Susquehannalike subsoil is much nearer the surface than in the typical areas of the type, being reached in places by the plow. In the most poorly drained flat or depressed situations the color of the surface soil frequently ranges to dark gray or nearly black on account of the high content of decaying vegetable matter. Such areas require artificial drainage before they can be used to advantage.

The type is very well suited to the production of cotton, corn, oats, sorghum, sugar cane, cowpeas, velvet beans, potatoes, and melons. Moderately heavy applications of commercial fertilizer or barnyard manure are required for the production of good yields. The imperviousness of the heavy clay subsoil has the effect of retarding underdrainage, so that the type is more slowly drained after heavy rainfalls and wet seasons than the Kalmia fine sandy loam with its friable sandy clay subsoil. Liberal additions of lime or ground limestone are beneficial.

The type occurs on second bottoms, standing above overflow. The most important areas are found along some of the streams in the northwestern part of the county. Most of this land is under cultivation, cotton being the most important crop.

MYATT SERIES.

The Myatt soils are prevailingly gray. The subsoils range from gray to mottled gray and yellow, and are practically impervious to water and air. These soils occupy the most poorly drained areas of the Coastal Plain stream terraces. They are mainly above overflow, but the surface is so flat that they remain inundated for long periods after heavy rains. They are closely associated with the Cahaba and Kalmia soils and are composed of old alluvium, consisting of water-laid Coastal Plain material. The fine sandy loam is the only type of this series encountered in Bullock County.

MYATT FINE SANDY LOAM.

The Myatt fine sandy loam in its typical development is a gray fine sand or loamy fine sand which passes into light-gray loamy fine sand, and this, in turn, at about 15 to 30 inches into light-gray or whitish fine sandy loam to fine sandy clay, usually mottled in varying degrees with shades of yellow. The texture frequently ranges close to a very fine sand. The type includes a phase, found in depressed, wet locations, having in the surface section a much darker color, dark-gray to black, due to the presence of organic matter. This dark material ordinarily does not extend below about 5 to 8 inches, and the subsoil of the phase is similar to that of the typical portion of the type.

This soil occurs as flat and poorly drained areas on low second bottoms or stream terraces. The characteristic native growth is pine, sweet gum, black gum, and gallberry bushes. Artificial drainage is necessary in order to bring the land into proper condition for cultivation. Applications of lime or ground limestone and of commercial fertilizers are essential to the successful production of crops. Sugar cane, sorghum, corn, oats, cabbage, Irish potatoes, tomatoes, lettuce, and other crops can be successfully grown.

The principal areas are the strips along Cowikee Creek, those in the vicinity of New Bethel Church, and those in the vicinity of Thompson. The type occurs in close association with the Kalmia fine sandy loam. It is a less desirable agricultural soil than the Kalmia, however, and a smaller percentage of it is under cultivation. It affords fairly good grazing.

KALMIA SERIES.

The surface soils of the Kalmia series are gray, ranging to grayish yellow, and the subsoils are mottled gray and yellow. The series is developed along streams of the Coastal Plain region on terraces lying largely above overflow. It occurs most extensively in Mississippi and Alabama. The soils are composed largely of material washed from Coastal Plain soils, although along the larger streams issuing from the Appalachian Mountains and Piedmont Plateau more or less sediment from these regions is mixed with the deposits. In the better drained situations the subsoils are yellow, the soils of such areas resembling very closely the corresponding members of the Norfolk series. Three members of the Kalmia series, the fine sand, fine sandy loam, and silt loam, are mapped in Bullock County.

KALMIA FINE SAND.

The Kalmia fine sand is a grayish fine sand, underlain at about 8 inches by a very pale yellowish fine sand, frequently mottled in the lower part of the 3-foot section with gray. In character of material this soil closely approaches the Norfolk fine sand. It generally retains more moisture than the Norfolk fine sand, partly on account of its lower position.

The type occupies nearly level stream terraces. The principal developments are on the second bottoms of Conecuh and Pea Rivers and Indian Creek. The surface is flat to billowy.

The agricultural value of this soil is nearly the same as that of the Norfolk fine sand, although this is a somewhat more productive soil, mainly because of its more generally moist condition in dry weather. Sweet potatoes, melons, vegetables, and sugar cane are among the most profitable crops grown on land of this kind. Rather heavy fertilization or treatment with barnyard manure is necessary for good yields. A higher vegetable-matter content is badly needed.

KALMIA FINE SANDY LOAM.

The soil of the Kalmia fine sandy loam is a gray fine sand, underlain at about 5 or 6 inches by pale-yellow loamy fine sand. This grades into a yellow fine sandy loam, which, in turn, is underlain at about 15 to 30 inches by yellow, friable fine sandy clay. There are

flat, poorly drained bodies of Kalmia fine sandy loam which differ from the typical in having a dark-colored surface soil, ranging from dark gray to black, and a mottled gray and yellow subsoil.

The most important areas of Kalmia fine sandy loam occur along Cowikee, Moores, Coleman, and Bughall Creeks, in the northern part of the county.

The type occupies level or nearly level stream terraces which, although representing former stream flood plains, are not subject to overflow, with the exception of the lower marginal strips during times of exceptionally high water. The type has the same range of crop adaptation as the Norfolk fine sandy loam. The material of the Kalmia rather closely resembles that of the Norfolk fine sandy loam, but it is more retentive of moisture, mainly on account of its position, and supports a better plant growth in protracted dry seasons than the corresponding Norfolk type. The more poorly drained portion of the type is rather too retentive of moisture and requires ditching and tiling.

For cotton, this type has about the same value as the Norfolk fine sandy loam, but oats, sugar cane, and corn do better with the same fertilization than on the Norfolk type. The soil is in need of vegetable matter, such as can be advantageously supplied by growing velvet beans or plowing under cowpeas, bur clover, or vetch. Moderate applications of high-grade fertilizers ordinarily are essential in the profitable utilization of this soil. The addition of ground limestone at the rate of 2 tons or more per acre or 1 ton of burnt lime is beneficial. A number of wild grasses and lespedeza afford some grazing. Most of this soil is under cultivation. Cotton is grown most extensively, but considerable corn and sugar cane are grown with good yields. Some cowpeas are grown with corn.

KALMIA SILT LOAM.

The Kalmia silt loam is a grayish silt loam, underlain by a mottled yellow and gray silty clay loam.

The type occupies stream terraces. It occurs along Cowikee Creek in the northeastern part of the county. There is very little of this soil in Bullock County. It is well suited to the production of grass, lespedeza, sugar cane, and sorghum, and where well drained to oats and corn.

THOMPSON SERIES.

The surface soils of the Thompson series are brown and in places grayish, while the subsoils are predominantly yellow, with mottlings of gray and shades of brown and yellow. The subsoil of the heavier members is slightly plastic, but not too compact to permit good underdrainage where drainage outlets are provided. These soils

occupy the first bottoms of streams in the Coastal Plain region and are subject to overflow. They are characteristically poorly drained, although the drainage is somewhat better than that of the related Bibb series. The Thompson series is intermediate between the Bibb and Ocklocknee series of first-bottom soils, and the soils are similar in color to those of the Kalmia series, which is intermediate between the Myatt and Cahaba terrace series. The Thompson soils consist of material washed largely from the Coastal Plain soils, such as the Norfolk, Ruston, Orangeburg, and Susquehanna. In Bullock County the series is represented by a single type, the Thompson sand.

THOMPSON SAND.

The Thompson sand consists of a rather dark gray sand, often somewhat loamy, underlain at variable depths by pale-yellowish material of about the same texture, frequently showing mottlings of rusty brown and light gray. In places a stratum of dark-colored sandy material is encountered within the 3-foot section. As mapped the type includes some fine sand and even some coarse sand, depending considerably upon the prevailing texture of the associated up-land soils.

This soil occurs chiefly along small streams rising in or flowing through the deep sandy types of the Norfolk series. In origin it is partly alluvial and partly colluvial, the greater part of the material having been transported rather short distances. The soil is characteristically poorly drained, mainly on account of seepage. This is a soil of rather low agricultural value, best suited under present conditions to pasturage. With the establishment of better drainage and with liberal fertilization sugar cane can be grown with fairly good yields.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Thompson sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414027.....	Soil.....	0.4	6.1	12.1	52.2	17.6	8.8	2.8
414028.....	Subsoil.....	.9	6.0	13.4	54.4	16.0	8.5	1.1

OCKLOCKNEE SERIES.

The Ocklocknee soils are prevailingly brown, ranging to dark gray. The subsoils are brownish or mottled brownish, yellowish, and gray. This series comprises the darker colored soils of the

first bottoms of Coastal Plain streams. The soils are composed mainly of wash from the Coastal Plain soils. In general they are subject to overflow. Three types of the Ocklocknee series, the fine sandy loam, loam, and clay, are recognized in this county.

OCKLOCKNEE FINE SANDY LOAM.

The typical Ocklocknee fine sandy loam is prevailingly a grayish-brown to brown loamy fine sand, underlain at about 10 inches by grayish, yellowish or mottled fine sandy loam, which passes below, within the 3-foot section, into a fine sandy clay mottled with yellowish, grayish, and drab colors. There is considerable variation in the soil in color and texture as well as in the character of the material at different depths throughout the 3-foot section. There are included areas of Ocklocknee silt loam and also many swells or hummocks of recently deposited loose sand of a light color. The latter material has been deposited over considerable areas of former Ocklocknee fine sandy loam or silt loam, making the land inferior in point of productiveness. The variation in the texture and color of the material is due mainly to differences in the velocity of the water by which it was deposited. Areas in which it is so variable that the prevailing material can not be classified as Ocklocknee are mapped as Meadow. The type includes areas of light-gray soil, Bibb fine sandy loam and fine sand, too small to map. Much of the Ocklocknee fine sandy loam is covered with alder, sweet gum, willow, bay, swamp maple, pine, blackberry bushes, "bamboo," and reed or wild cane. The largest strips of this type occur along Pea and Conecuh Rivers and Coleman, Bluff, and Big Sandy Creeks.

Properly protected from overflow by enlarging the stream channel and diking the banks, and thoroughly drained by ditching, this soil can be profitably used for the production of corn, oats, forage crops, sugar cane, lespedeza, and Johnson grass. Certain varieties of cotton also succeed. Application of lime and moderate additions of commercial fertilizers increase the yield of corn and other crops. Lespedeza and several wild grasses afford good grazing.

OCKLOCKNEE LOAM.

The Ocklocknee loam is a brown loam to heavy fine sandy loam of mellow structure, underlain at variable depths by yellowish-brown to mottled yellowish-drab and rusty-brown clay. In places alternating strata of material of variable texture and color occur in the subsoil.

The type occurs in overflowed stream bottoms. The principal area occurs in the northeastern part of the county along Cowikee Creek.

This is a productive soil, easily tilled and well suited to cotton, corn, sugar cane, and forage crops. Lespedeza, Bermuda grass, Johnson grass, and wild grasses afford good pasturage and produce heavy yields of hay.

Most of this land is forested with the moisture-loving trees and shrubs common to the region.

OCKLOCKNEE CLAY.

The Ocklocknee clay typically consists of a brown clay, usually faintly mottled with rusty brown, and underlain at about 8 to 10 inches by a mottled drab, rusty-brown, and yellowish-brown, sticky, plastic clay. The texture of the surface material ranges to fine sandy loam, loam, and silty clay loam. The type occurs in overflowed bottoms of the larger streams and consists of material washed from various upland types, chiefly the Susquehanna, with considerable admixture of alluvium from the Oktibbeha and exposures of the calcareous beds which underlie much of the uplands. The influence from the calcareous material is not sufficient to give the type the characteristic granular soil structure of the Trinity clay, but this is not a stiff, waxy clay like the Susquehanna clay. It shows some tendency to crumble on drying out, which tendency increases as the type approaches the characteristics of the Trinity. The type grades into Trinity clay in places without distinct lines of separation.

The larger areas of this type occur west of Union Springs and in the northeastern part of the county.

This is a very productive soil, well suited to cotton, corn, sugar cane, soy beans, cowpeas, Johnson grass, and lespedeza. A bale of cotton per acre is obtained by proper management in good seasons without fertilization. Under boll-weevil conditions the late nature of the land militates against its value for cotton, as the late crops on the heavy bottom soils usually suffer most severely from the ravages of the weevil.

The type is materially improved by diking and by enlarging the streams to prevent overflow and also by ditching or tiling the more poorly drained swales.

BIBB SERIES.

The soils of the Bibb series consist typically of white, compact material, and the subsoils are white or mottled white and yellowish and are compact and plastic. These soils occupy the first bottoms of streams. They are subject to overflow and to intermittent wet and dry stages. The material is derived mainly from Coastal Plain soils. Drainage is poor. The Bibb series is represented in this county by two members, the fine sandy loam and the silty clay loam.

BIBB FINE SANDY LOAM.

The Bibb fine sandy loam is a grayish fine sand to fine sandy loam, underlain at 4 or 5 inches by light-gray to drab fine sandy loam mottled with yellow or yellowish brown. The subsoil varies considerably in color.

The type occurs in the very wet first bottoms of the Conecuh River and east and southeast of Pine Grove. It is forested with bay, magnolia, water oak, holly, cypress, beech, birch, and sweet gum. Swamp palmetto is common.

The Bibb fine sandy loam is valuable for pasturage and its forest growth.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Bibb fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414046.....	Soil.....	0.2	0.6	2.2	40.4	28.6	16.2	11.8
414047.....	Subsoil.....	.1	.4	1.4	37.8	22.8	23.4	14.0

BIBB SILTY CLAY LOAM.

The Bibb silty clay loam consists of mottled gray and yellowish-brown silty clay loam, grading into mottled gray or drab and yellowish silty clay loam to silty clay. Brownish material, similar to that of the Ocklocknee, and consisting of silt loam or silty clay loam, is usually present in the surface soil to a depth of about 1 inch, but the subsoil is much grayer than that of the Ocklocknee series.

This soil was mapped only in one strip, along Pea River. It is subject to frequent deep overflows, and remains in a permanently soggy condition between overflows. There are many abandoned channels or swales which hold water for long periods.

There is a dense growth of overcup oak, birch, ironwood, sweet gum, maple, bay, and swamp pine. The type is valuable chiefly for its forest growth and for pasturage. Where cleared it produces good pasturage and hay crops. It is adapted to lespedeza.

TRINITY SERIES.

The Trinity soils are predominantly black, ranging to dark brown. They occupy first-bottom alluvial lands, usually being developed as flat lands in comparatively shallow stream valleys. They are derived mainly from material washed from soils of the Houston series. This series is represented in Bullock County by but one type, the clay.

TRINITY CLAY.

The Trinity clay consists of a brown to dark-brown clay, having frequently a yellowish cast. There is generally no considerable change in the material, except some variation in color, throughout the 3-foot section. The subsoil is somewhat lighter than the surface soil. In places the immediate surface soil is somewhat loamy and friable. Along the outer edge of the bottoms reddish colluvial material from the adjoining slopes of Oktibbeha clay has given a reddish color to the bottoms in places. When wet the soil is sticky, and if plowed is likely to assume unfavorable structural conditions, becoming hard and intractable, but if plowed when in such condition that the soil is dry enough to crumble rather than stick, an excellent tilth results. The soil carries considerable lime, brought down in the sediments derived from the Houston soils, and it is largely on this account that much of the land has a tendency to crumble on drying out. Where this is the case plowing can be carried on under conditions of greater moisture than in case of those soils in which the material is not calcareous and is less inclined to crumble on drying out.

The type occurs in the broad, flat overflowed bottoms of some of the creeks in the northern and northwestern parts of the county.

This is a very productive soil, giving without fertilization heavy yields of cotton and corn. Where properly protected from overflow, it is capable of producing 1 bale of cotton, 50 bushels or more of corn, and 60 bushels or more of oats per acre without fertilization. Owing to the tendency of cotton to develop slowly on this soil, it may not prove a profitable crop under boll-weevil conditions, except where phosphatic fertilizers are applied to hasten the maturity of the bolls sufficiently to produce a crop before the insects have multiplied too abundantly. Johnson grass, Bermuda grass, lespedeza, melilotus, and, in small properly drained areas protected from overflow, alfalfa can be grown successfully.

HANNAHATCHEE SERIES.

The surface soils of the Hannahatchee series are brown to reddish brown. The subsoils are prevailingly reddish brown. Locally the color of the subsoil varies because of the incomplete mixing of various grades of alluvium derived from different upland soils. The Hannahatchee soils occupy the overflowed first bottoms of Coastal Plain streams. They are composed of wash from the Coastal Plain upland, carrying sufficient material from the Susquehanna, Orangeburg, and Greenville soils to impart a characteristic reddish color, as distinguished from the brownish color of the Ocklocknee soils. Two members of the Hannahatchee series, the fine sandy loam and the loam, are encountered in Bullock County.

HANNAHATCHEE FINE SANDY LOAM.

The typical Hannahatchee fine sandy loam is a reddish-brown fine sandy loam, underlain at variable depths, usually between about 8 and 20 inches, by reddish to yellowish or mottled reddish and yellowish silty clay loam to fine sandy clay. There are frequent textural variations in the vertical section, particularly in the subsoil, consisting of alternating layers varying from fine sandy loam to fine sandy clay. Often the lower subsoil consists of dark-colored material containing considerable organic matter. This dark-colored stratum represents soil over which reddish material has been deposited, the latter consisting of recent wash from the reddish upland soils which contain enough red material to affect the color of the alluvium. It appears that with the advance of erosion over the uplands, and consequent exposures of a larger area of the prevailing reddish subsoil material of the upland soils, a larger proportion of reddish material is carried down over the stream flood plains than formerly was the case when more grayish material was transported to the stream bottoms from the less eroded uplands having prevalently grayish surface soils. The grayish material thus deposited in time assumed a dark color, owing to the accumulation of organic matter under wet bottom-land conditions, and the redder soil was washed down over it.

The principal areas of this type occur along streams in the southern and southwestern sections of the county in association with red upland soils which have been washed considerably.

The type occupies practically level stream bottoms, which are subject to overflow and to the repeated addition of sediment. The areas mapped include patches of other soils, such as silty clay loam and loam of the Hannahatchee series and some Ocklocknee fine sandy loam, loam, and silty clay loam, too small and unimportant to be mapped separately.

This is a productive soil, well adapted to cotton, corn, sugar cane, grass, lespedeza, and oats.

In the following table the results of mechanical analyses of samples of the soil and subsoil of this type are given:

Mechanical analyses of Hannahatchee fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414023.....	Soil.....	0.2	0.6	0.6	44.0	35.6	10.5	8.3
414024.....	Subsoil.....	.3	1.2	1.2	23.6	33.6	22.8	17.1

HANNAHATCHEE LOAM.

The Hannahatchee loam is a brown to reddish-brown heavy loam to fine sandy loam, underlain at variable depths by reddish-brown loam, fine sandy loam, clay or fine sandy clay, often mottled with gray and shades of yellow and brown. In places the subsoil, beginning at about 6 to 12 inches, is a grayish fine sandy loam which grades below into mottled yellowish, drab, and brownish fine sandy loam to clay. Also there are places where the color of the material is more of a brown or yellowish brown with a greenish cast, due to wash from exposures of calcareous strata. The principal areas of this type occur along Perote Creek.

The material is derived mainly from the reddish upland soils, such as the Orangeburg, Susquehanna, and Oktibbeha. The soil is essentially alluvial, but includes some colluvial material from adjoining slopes. There are some included patches of Hannahatchee clay and Hannahatchee fine sandy loam.

This is a valuable, productive soil. Good yields of corn, oats, forage crops, and grass are secured, although crops are sometimes injured by overflows.

The results of mechanical analyses of samples of the soil and subsoil of the Hannahatchee loam are given in the following table:

Mechanical analyses of Hannahatchee loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414053.....	Soil.....	0.0	0.3	0.3	14.3	33.5	32.6	19.0
414054.....	Subsoil.....	.0	.1	1.0	17.1	26.6	34.1	21.0

MISCELLANEOUS MATERIAL.

MEADOW.

Meadow comprises first-bottom alluvium, so variable in texture and color that any satisfactory separation into definite soil types is impossible. The material is largely sand, sandy loam, and silt loam of the Ocklocknee and Bibb series. The type is mainly confined to the narrow bottoms of small streams and is subject to frequent overflow. It is almost permanently saturated. The greater part of this type is covered with water-loving vegetation. With proper drainage a large part of it could be reclaimed and profitably used in the production of the important crops of the region, especially corn, oats, and forage crops.

SUMMARY.

Bullock County is situated in the southeastern part of Alabama. It has an area of 607 square miles, or 388,480 acres.

Physiographically the county is divided into two parts by the Chunnenugee Ridge, the "prairie region," comprising the northern part of the county, and the "sandy-lands region" the southern part. There are two minor topographic divisions, the first and second bottoms, which are developed throughout the county. The surface configuration of the prairie region ranges from hilly and even rough to undulating. This part of the county is drained by several large creeks and "wet-weather" streams emptying into the Alabama and Chattahoochee Rivers. Topographically the southern part of the county, or the sandy-lands region, varies from a broad, sandy upland plain to somewhat hilly country. It is dissected by small but nearly continuously flowing streams, and is drained mainly by the Conecuh and Pea Rivers. The first and second bottoms comprise soils of alluvial origin. The rougher areas are excessively drained, while the lower uplands and the terraces require artificial drainage. A large total area is subject to erosion.

Bullock County was established in 1866. The population is reported in the 1910 census as 30,196. The greater part of the population is colored. Union Springs, the county seat, is the largest town, with a population of over 4,000. The interests of the country are almost exclusively agricultural, and the urban population is comparatively small. In the best-farmed sections, particularly in the southern part of the county, farm buildings are kept in good condition, but where the land is held in large estates the improvements are only fair. Nearly 90 per cent of the farms are operated by tenants. There is a tendency on the part of white owners to return to the farms.

Transportation facilities are good. The region adjoining High Ridge in the southern part of the county is most remote from a railroad, although no part of the county is more than 12 miles from a shipping point. The public roads are kept in good condition.

The summers are long and hot and the winters are mild, with occasional frosts and snow flurries. The mean annual temperature is about 65° F. The average annual precipitation of about 54 inches is favorably distributed for the growing and harvesting of crops. There is a normal growing season of about 240 days.

Cotton is the money crop of the county. The yields are relatively low. Some fields of this crop are injured by cotton wilt, and the boll weevil causes considerable damage. Corn, which ranks next in importance, is receiving increasing attention. It is not produced in sufficient quantities to supply the local market. Oats and rye are grown in small fields. A large number of forage and hay crops do

well. Peanuts are grown to some extent, mainly for forage, and sugar cane and sorghum for sirup. Not enough vegetables are grown to supply the local demand, although the soils are adapted to a wide variety of vegetables and truck crops. Strawberries are grown to some extent, together with blackberries and dewberries. Some fruit, mainly peaches, apples, figs, pears, and grapes, are grown for home use, and there is a large commercial peach orchard near Peachburg. Increasing attention is being given to the production of pecans. The canning of fruit and vegetables is becoming important.

Stock raising has not been important in Bullock County, although this industry is receiving increasing attention as the interest of farmers is diverted from cotton production by the ravages of the boll weevil. Very little dairying is conducted, and there is an underproduction of beef cattle and hogs to meet home needs.

Crop rotation receives practically no attention. Fertilizers are being used in increasing quantities on the sandy lands. On some of the soils the use of lime is beneficial. The farm labor in Bullock County is largely colored. There is a general need for an improvement in farm methods, including the use of modern farm machinery.

Thirty-two soil types, representing 17 different series, together with one miscellaneous classification, Meadow, are recognized in Bullock County. These soils cover a wide range and are capable of supporting a widely diversified system of agriculture. They are used, largely without regard to their adaptability, mainly for the production of cotton and other staple crops.

The Norfolk soils are extensively developed in this county. They are mainly sandy and of low productiveness. They require a careful selection of crops systematically rotated, together with the maintenance of a high organic-matter content and the proper use of fertilizers.

The Orangeburg soils produce peaches of excellent quality, and are well suited to general farming.

The Ruston sandy loam and fine sandy loam are adapted to a wide range of staple crops and fruits. The smoother areas of the gravelly sandy loam are particularly adapted to cotton.

The rough areas of Susquehanna clay are suited to stock raising. The Susquehanna fine sandy loam has a wide range of crop adaptation, and can be worked under widely varying moisture conditions. The stony sandy loam, while valuable for crop production in the smoother areas, is best suited to pasturage and forestry.

The Portsmouth fine sandy loam and the Plummer fine sandy loam are of low agricultural value because of their poor drainage. They are in need of lime.

The Houston soil is locally known as "white prairie" and "black prairie" land. The principal need of this land is a system of farming designed to save the soil from erosion and to restore and maintain its productiveness.

Owing to their undulating topography and freedom from erosion, the Oktibbeha soils are well suited to extensive agriculture and the use of modern power-propelled farm machinery. Forage crops do well on these soils.

The Greenville gravelly sandy loam is a variable soil. The smoother areas produce fair to good yields of cotton, while the steeper slopes are best adapted to pasturage.

The Leaf and Myatt fine sandy loams and the Kalmia soils are in need of drainage and liming. Where properly handled they produce good yields of general farm crops and particularly of sugar cane.

The Thompson sand is a poorly drained soil of low agricultural value. It is best suited to pasturage.

The soils of the Ocklocknee series are extensively cultivated. They are soils of high productiveness and are popular for the type of farming commonly practiced in this county.

The Bibb soils are permanently wet and soggy. They are valuable only for pasturage and for their forest growth.

The Trinity clay where not subject to overflow is probably the most valuable of the bottom-land soils, producing heavy yields of cotton, corn, and other crops.

The Hannahatchee soils are among the best drained of the first-bottom types. They are adapted to corn, sugar cane, and cotton.

Meadow comprises first-bottom alluvium of widely variable character. It supports a growth of water-loving vegetation. With proper reclamation it can be profitably utilized for the production of all the important crops of the region.

[PUBLIC RESOLUTION—No. 9.]

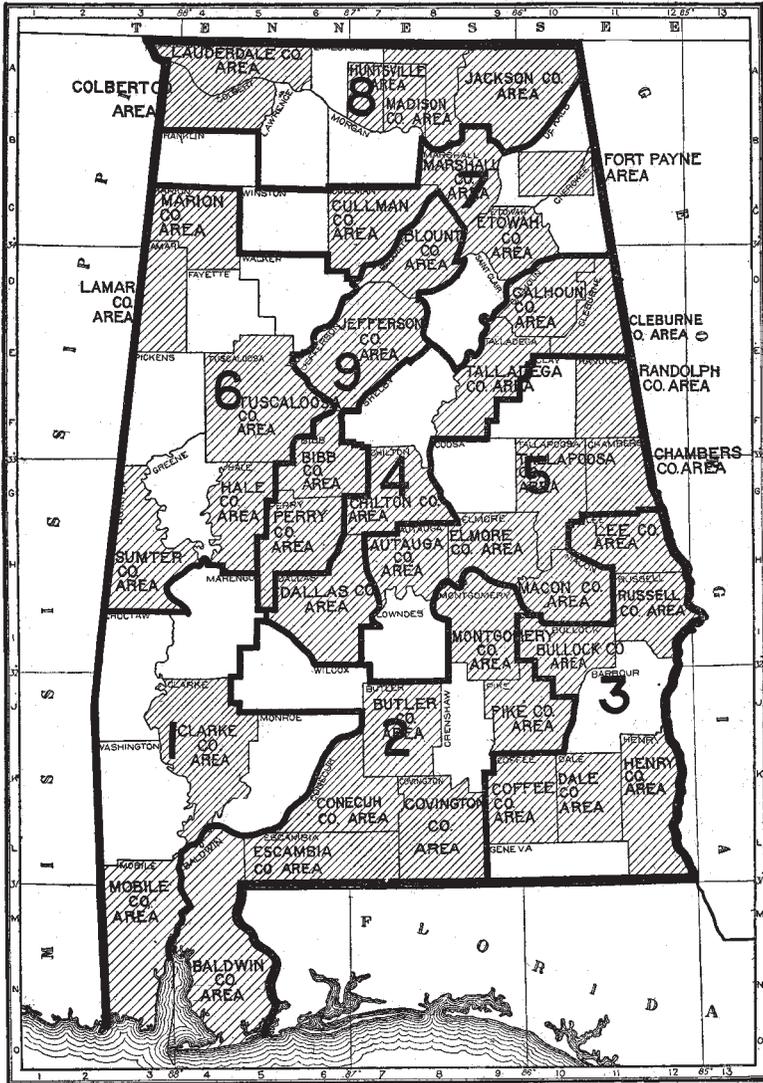
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.



Areas surveyed in Alabama.

NRCS Accessibility Statement

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

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