

Issued July 30, 1913.

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 AGRICULTURE AND INDUSTRIES;
EUGENE A. SMITH, STATE GEOLOGIST.

SOIL SURVEY OF CHILTON COUNTY,
ALABAMA.

BY

L. CANTRELL, OF THE U. S. DEPARTMENT OF AGRICULTURE,
AND W. E. WILKINSON, OF THE ALABAMA DEPARTMENT
OF AGRICULTURE AND INDUSTRIES.

HUGH H. BENNETT, INSPECTOR IN CHARGE SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1911.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE,
1913.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., November 27, 1912.

SIR: The accompanying manuscript report and map cover the soil survey of Chilton County, Alabama. This is one of the projects for 1911, undertaken in continuance of the cooperative agreement between the State of Alabama and the Bureau of Soils, and the selection of the area was made after conference with the State officials. The selection of this area also bore the indorsement of Hon. F. L. Blackmon, within whose district the area lies.

I have the honor to recommend that this report be published as advance sheets of the Field Operations of the Bureau of Soils for 1911, as authorized by law.

Very respectfully,

MILTON WHITNEY,
Chief of Bureau.

HON. JAMES WILSON,
Secretary of Agriculture.

CONTENTS.

	Page.
SOIL SURVEY OF CHILTON COUNTY, ALABAMA. By L. CANTRELL, 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.....	7
Agriculture.....	9
Soils.....	12
Orangeburg fine sandy loam.....	15
Orangeburg sandy loam.....	16
Ruston sandy loam.....	18
Ruston fine sandy loam.....	19
Ruston gravelly sandy loam.....	20
Susquehanna fine sandy loam.....	21
Bibb sandy loam.....	22
Ocklocknee fine sandy loam.....	23
Norfolk loamy sand.....	23
Kalmia sandy loam.....	25
Cahaba sandy loam.....	26
Bradley sandy loam.....	27
Bradley gravelly sandy loam.....	27
Louisa loam.....	28
Louisa slate loam.....	29
York stony loam.....	30
Congaree silt loam.....	31
Clarksville stony loam.....	32
Montevallo shale loam.....	32
Holly silt loam.....	33
Meadow.....	33
Summary.....	34

ILLUSTRATIONS.

FIGURE.

	Page.
Fig. 1. Sketch map showing areas surveyed in Alabama.....	5

MAP.

Soil map, Chilton County sheet, Alabama.

SOIL SURVEY OF CHILTON COUNTY, ALABAMA.

By L. CANTRELL, of the U. S. Department of Agriculture, and W. E. WILKINSON, of the Alabama Department of Agriculture and Industries.

DESCRIPTION OF THE AREA.

Chilton County is situated at about the geographical center of the State of Alabama and is somewhat irregular in shape, being about 31 miles wide at the base, 16 miles wide at the top, and 28 miles in length between these two lines. It was originally included in Autauga, Bibb, Perry, Shelby, and Elmore Counties, from which it was organized into Baker County December 30, 1868, the name being later changed to Chilton. The county comprises an area of 722 square miles, or 462,080 acres.

In surface features practically three-fourths of the county exhibits some variation from gently rolling and rolling in the Coastal Plain portion to decidedly hilly and broken in the Piedmont section. There are really no mountains in the county. North of Clanton about $6\frac{1}{2}$ miles there is an elevation rising about 835 feet above sea level, locally known as "Jemison Mountain." There is another about 4 miles west of Stanton, in the southwestern part of the county, 650 feet high, which is locally known as

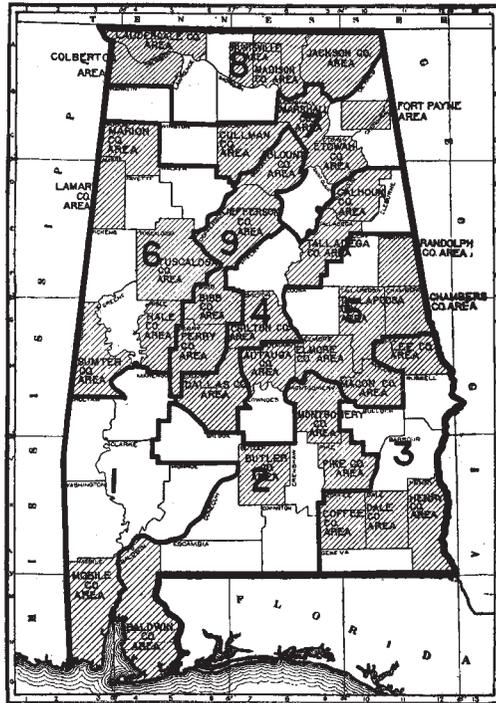


FIG. 1.—Sketch map showing areas surveyed in Alabama.

"Perry Mountain." The county has an average elevation of about 500 feet. The Piedmont section begins about 1 mile east of where the Louisville & Nashville Railroad crosses the north county line and extends to the Coosa River on the east, covering a strip of country about

4 miles in width. Lying west of the Piedmont is a strip of about equal width which includes areas of limestone and shale soils. The topography of this section varies from rolling to hilly, except for the flat bottom and terrace soils. It also extends southward parallel with the Louisville & Nashville Railroad to the Elmore County line and averages from 3 to $3\frac{1}{2}$ miles in width. The southern and western portion of the area embraces gently rolling to rolling Coastal Plain country.

The drainage of the uplands is ample to excessive, many of the steeper slopes, particularly of the Piedmont, have been badly eroded. Gullies are common in places throughout the county, but there are large areas over which erosion has not done much serious damage, the slopes being smooth and well suited to cultivation. The first bottoms of streams are subject to overflow and much of the land remains in a soggy condition between overflows. Here artificial drainage must be resorted to if good results with crops are to be obtained. The stream-terrace soils stand above overflow. They are flat to undulating and have good drainage in the main. The Coosa River, which forms nearly the entire eastern boundary of the county, with its tributaries, drains the eastern part of the county. Big and Little Mulberry, Chestnut, Swift, Buck, Oakmulgee, and Little Oakmulgee Creeks take care of the water of the remainder of the county. At present considerable interest is being manifested in the opportunities offered by the Coosa River for the development of electric power plants.

Chilton County was first settled about 1833 by a few families from North Carolina and Georgia, who formed settlements at old Mulberry and Bensen, on Big Mulberry Creek, in the west-central part of the county, and at Cooper, now on the Louisville & Nashville Railroad 7 miles south of Clanton. These pioneers were joined in 1838 by other families from the Carolinas, Virginia, and Georgia.

Until about 20 years ago the principal occupation of the inhabitants was lumbering. With the cutting off of the pine more land was brought into cultivation. At present agriculture is the chief occupation and the main source of revenue. Some bodies of merchantable shortleaf and longleaf pine and hardwoods are scattered over the county, but these are being rapidly cut and sawed into lumber. About one-third of the area of the county is in cultivation, and probably 90 per cent of the remainder is tillable.

There are in the county two large sawmills, two turpentine stills, and a small plant that turns out dentists' burs and machines for making them.

Three railroads now traverse the county. The main line of the Louisville & Nashville Railroad crosses the county diagonally near the center, connecting Clanton, Ala., with Birmingham, Ala., and

Nashville, Tenn., on the north, and Montgomery (the chief market), Mobile, and New Orleans, on the south. The Southern Railway, which runs parallel with Big Mulberry Creek across the western part of the county, affords transportation to that section, placing it in close touch with Birmingham, Ala., to the north, and Selma and Mobile to the south. The Mobile & Ohio Railroad, which runs near and parallel to the Southern Railway, crosses the latter at Maplesville and turns in a southwestern direction, cutting the county line between Chilton and Autauga Counties near Billingsley, Ala.

Clanton, located near the center of the county on the Louisville & Nashville Railroad, and having a population of about 1,500, is the county seat and principal business center. It is the shipping point for a wide territory, considerable cotton, lumber, beef cattle, poultry, eggs, and melons seeking a market from this point. Maplesville, Riderville, Stanton, Jemison, Thorsby, Verbena, Cooper, and Mountain Creek are also important business and shipping stations. In the vicinity of Thorsby, which was settled by immigrants only about 12 years ago, the production of strawberries has assumed considerable importance.

In the southeastern part of the county graphite is being mined and put on the market, and small nuggets of gold have been found, but not in sufficient quantities to warrant mining operations.

There is an excellent system of rural telephones over the county, owned and operated by the farmers, and the rural free delivery of mail reaches the majority of the homes. Good schools are within reach of every home. The wagon roads, while not kept in good condition, can be easily improved with the abundance of good material at hand. For a farmer of small means the opportunities are excellent.

CLIMATE.

Chilton County is favored with a climate that admits of the profitable cultivation of a very wide range of crops. The staple products of both the North and the South can be grown. Fruits and vegetables of all kinds thrive, and the winters are so mild that some crops make growth the year round. With the exception of a few weeks in winter, no halt need be made in field work. Light falls of snow occur occasionally and now and then light freezes, but they are of short duration.

While the mean annual rainfall of 47.18 inches is fairly well distributed, droughts sometimes occur during the hot summer months, and under such unfavorable conditions the crops may be curtailed. This is exceptional where the soil is well managed.

The maximum precipitation occurs during the winter months, when serious damage is done by washing and gulying unless care is exercised to keep the fields terraced, the hillsides ditched, or their

surface covered with some thick-growing cover crop like the small grains. The minimum precipitation as a rule occurs in the late summer and early fall months, which favors the maturing and gathering of farm crops.

Below are tables showing the weather conditions of Chilton County for the 16 years from 1893 to 1908, inclusive, and for 1909 and 1910, as furnished by the Weather Bureau:

Normal monthly and annual temperature and precipitation, etc., for Clanton, Ala., from 1893 to 1908.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for driest year.	Total amount for wettest year.
	° F.	° F.	° F.	In.	In.	In.
January.....	45.5	79	12	4.26	3.58	4.41
February.....	45.9	78	— 9	6.26	7.42	2.85
March.....	57.5	93	19	5.68	7.57	15.07
April.....	63	92	30	3.48	1.39	.89
May.....	71.1	95	35	4.17	.40	5.33
June.....	77.5	100	46	3.00	.37	2.17
July.....	79.8	100	57	4.47	.56	12.48
August.....	79.3	102	55	3.98	1.05	2.13
September.....	74.8	100	38	2.17	.70	10.33
October.....	63	100	29	2.39	.05	5.01
November.....	54.1	82	18	2.94	1.78	1.92
December.....	46.3	80	10	4.38	1.05	5.23
Year.....	63.2	102	— 9	47.18	25.92	67.82

Weather conditions for 1909 and 1910.

Month.	Data for year 1909.				Data for year 1910.			
	Temperature.			Precipitation.	Temperature.			Precipitation.
	Mean.	Maximum.	Minimum.	Total.	Mean.	Maximum.	Minimum.	Total.
	° F.	° F.	° F.	In.	° F.	° F.	° F.	In.
January.....	50.2	76	13	1.99	46	72	16	3.25
February.....	50	78	17	10.17	46.6	71	20	5.60
March.....	56.3	78	31	8.69	61.1	88	25	.65
April.....	63	86	34	7.80	61.4	85	31	3.59
May.....	67.8	87	37	6.56	69	84	40	4.07
June.....	78	95	58	7.83	75.4	94	50	5.95
July.....	80.1	96	60	6.51	78.4	92	62	8.54
August.....	81	101	60	1.67	79.6	95	63	2.38
September.....	75.6	96	42	4.49	77.4	95	49	2.54
October.....	63.2	92	29	.72	66.2	93	27	4.00
November.....	58.9	84	26	1.65	51.8	77	29	2.09
December.....	41.6	71	13	4.97	42.7	72	20	4.63
Year...	63.8	101	13	63.05	63	95	16	47.29

AGRICULTURE.

The pioneers who formed the first settlements in this county produced the food crops, corn and wheat, and such other necessities as wool, pork, and beef. Later, as agriculture began to develop, cotton became the staple crop on the larger and more progressive plantations. It was cultivated, spun, and woven by negroes, who at that time furnished practically all of the labor in the county. The rotation of crops in those days was unknown, and when the naturally fertile soils failed, through continued use, to produce profitable yields, they were "turned out" or allowed to lie fallow or to become reforested, and in the winter new fields were cleared. After the close of the war a new system of agriculture was gradually evolved. Plantations of 1,000 to 5,000 acres were broken up into smaller farms and settlements became more numerous, according to the needs of the increased population. The average size of the farms in 1900 was 95.5 acres, and in 1910 it was 80¹ acres. At present about 90 per cent of the farms are operated by the owners.

The old practice of abandoning land which is locally termed "worn out" has about disappeared, and a system of crop rotation and fertilization has been introduced in order to maintain the productivity of the soil. The more progressive planters have begun to plant cowpeas, peanuts, and oats upon their cotton and corn lands, and such soils, where examined, were in a higher state of productivity than those planted year after year to cotton and corn only. The good effects of deep plowing, rotation, and the use of leguminous crops have been demonstrated in many instances, as on the Kalmia sandy loam and the Ruston sandy loam, in the vicinity of Stanton and Maplesville, where from 1 bale to 1½ bales of cotton per acre is being secured from these lands. There are large areas of other soils equally as productive. Although there is much land in the county which, with good management, will yield from 1 to 1½ or even 2 bales of cotton per acre, and give good yields of corn, cowpeas, hay, and other crops, many of the farmers are slow to adopt the more intensive methods of farming. Too many of the farmers have been buying from the local merchants with the proceeds of their cotton crops supplies, such as corn, hay, and meat, that could be produced profitably on the farm. Several thousand dollars' worth of corn, meat, and hay are imported annually, all of which could be produced locally without any increase in acreage if sufficient effort were made and proper methods employed.

The average yield of corn is about 10 or 12 bushels per acre. There is no reason why this should not be doubled, or even trebled, without

¹ The Census tabulates each tenancy as a farm. The average individual holding is larger than this.

any extra cost save that of growing some one of the leguminous crops in rotation with the cotton and corn. Although nearly every type of soil in the county is suited to the growing of grasses and other forage crops, most of the hay used is purchased.

The staple crop is cotton, of which, according to the Thirteenth Census, 34,823 acres were grown, yielding 11,188 bales. Owing to the natural growth of population and the stimulus of high prices, there has been a considerable increase in the acreage planted, with a somewhat greater proportionate increase in yield per acre. On an average the yield per acre is about one-third of a bale. The fact that three-fourths to 1 bale or more per acre is easily secured by some of the more progressive farmers proves conclusively that better average methods of soil management are necessary in the culture of this crop.

The acreage in oats shows a decided increase over that of a decade past. This crop does well on nearly all the well-drained soils having a clay subsoil within about 5 to 12 or 15 inches of the surface. The Louisa, Orangeburg, Ruston, Cahaba, and Kalmia soils are best suited to the crop. With proper protection from overflow and the improvement of drainage the bottom lands also give good yields of oats. The crop should be grown more extensively not only as a source of forage for the farm stock, but also for the connecting link which it forms in a well-arranged rotation.

Wheat, which was formerly grown to some extent on the Louisa soils, has been largely abandoned, mainly because of poor yields and the high price of cotton.

Enough sugar cane is grown on nearly every farm to supply home needs. Its production for the market could be made profitable.

The commercial production of vegetables and fruits has never been attempted, except by a few truckers at Thorsby, who are engaged in the cultivation of strawberries, peaches, and Irish potatoes. Watermelons and cantaloupes are grown in the southern part of the county by only a few farmers, who ship them to Birmingham. Other truck crops, such as beans, peas, tomatoes, and cabbage, are grown for home consumption only.

A few vineyards and small apple and peach orchards are seen here and there, but fruit is not grown commercially.

Stock raising and dairying have never been developed, although with the long grazing period and the great variety of forage crops adapted to the soil and climatic conditions there is no reason why more attention should not be given to these industries. A few hogs are kept and grades of the better breeds are rapidly displacing the half-domesticated stock of earlier periods. No attention is paid to the raising of horses and mules, notwithstanding the high price paid for work stock and the many facilities at hand for raising them on the farms.

The farmers of the county are in a general way recognizing the broad soil adaptations of the principal crops which they now grow. The bottom lands when used are devoted almost exclusively to corn and sugar cane, while the higher lying soils are used for cotton, oats, sorghum, and corn.

It is pretty well understood by the farmers of the county that the heavier soils produce larger crops and are more durable than the sandier lands. The best yields can not be secured where the same crops are grown continuously in the same field. Regardless of the cause of soil deterioration under such a system, the remedy is found in a systematic rotation of crops and intelligent methods of cultivation. A good rotation and one that could be easily adopted by a majority of the farmers is: First year, corn, with cowpeas either broadcast or drilled between the rows; second year, oats (fall-sown), followed by cowpeas or soy beans; third year, cotton, with crimson clover, oats, or rye sown between the rows in the fall. This rotation will be found to include all the features in a system designed to renovate the soil, increase the yields, and make possible that diversified farming which will be necessary to combat the boll weevil. Many other rotations could be arranged, and it will be advantageous to change the system occasionally. It is especially desirable to include the legumes to provide vegetable matter to be plowed under. The present one-crop system has long failed to maintain soil productivity and has resulted in the evils attendant upon the unfortunate credit system, which is harmful both to the tenant and to the landowner.

The beneficial effects of organic matter as a source of nitrogen, as a constituent in increasing the capacity of soils to hold water, and as a factor in regulating their physical condition are being more fully understood every day. In the rotation outlined provision is made for the plowing under of a catch crop of cowpeas or some other legume, which will be sufficient in the case of many fields. On lands badly "worn out" it will be well to increase the number of green manuring crops in the rotation for the first few years, using cowpeas, soy beans, clover, vetch, or some of the other legumes. To obtain the best results from any rotation thorough cultural methods must be practiced, including deep breaking and a carefully prepared, well-pulverized seed bed, especially on the heavier soils; application of organic manures wherever available and properly formulated commercial mixtures where their need is indicated; and frequent cultivation of the intertilled crops to prevent loss of moisture by evaporation, and incidentally to keep down noxious weeds. By the use of a system of crop rotation such as outlined, much of the expenditure for fertilizers can be saved each year.

Fertilizers relatively high in nitrogen and phosphoric acid are used on the sandy lands for cotton. A favorite mixture is cotton-

seed meal and ground or acidulated phosphate rock, from which good results are obtained. Most of the farmers use from 200 to 300 pounds per acre, spreading it with a drill at or before the time of planting. Nitrate of soda at the rate of 25 to 50 pounds per acre is often applied by the side of the rows during the second working. Applying a portion of the fertilizer at a time is taking the place of the old way of applying it all at once, and crops seem to do better as a result of the change.

Both white and negro labor is employed on the farms, usually by the day. Laborers are paid from 75 cents to \$1 a day. Most of the farm work is done by the owners of the land. When land is leased the owner receives one-fourth of the cotton and one-third of the corn crop, where the tenant furnishes his own tools and stock, and one-half of the crops where the landlord furnishes everything except the labor.

Farm lands along the public highways are increasing rapidly in value. A few areas are valued for their timber.

SOILS.

Chilton County embraces four important soil divisions or provinces, as follows: (1) The Piedmont Plateau, occupying the greater part of the eastern third of the county, or that portion lying to the east of a line which approximately parallels the Louisville & Nashville Railroad from the vicinity of Mountain Creek to within about a mile of the railroad at the northern boundary of the county and running from 1 to 4 miles east of the railroad; (2) the Coastal Plain region, lying to the west of the Piedmont Plateau and including by far the greater proportion of the uplands; (3) the Limestone Valleys and Uplands, represented by comparatively small areas in the north-western part of the county; and (4) the River Flood Plains, including the stream bottoms and associated higher terraces.

In the major divisions identification has been based upon the genetic similarity of the included materials. In the Piedmont section the soils have been formed through the decay of the underlying slates and associated rocks. The Coastal Plain soils are sedimentary in origin, the material forming them having been deposited by water in the sea that covered that part of the country in the very remote past. The limestone soils represent the residual products left upon the decomposition of cherty limestone rock. The alluvial soils, or stream-bottom and terrace types, comprise materials deposited by the flowing water of streams. The first-bottom lands of this division are still subject to overflow and addition of material laid down as sediments with each inundation. These are the youngest soils in the area in point of formation. The terraces stand above overflow, or at least above normal overflow, and represent relatively old alluvium

deposited by the water of the streams when flowing at high levels. The terrace soils hold an intermediate position in point of weathering between the slightly weathered first-bottom soils and the contiguous sedimentary upland soils in which weathering has reached an advanced stage.

These large soil divisions or provinces have been subdivided into soil series; that is, groups of soils having a common origin, the members of which differ in texture but resemble each other in other important physical characteristics, such as color, structure, topography, and drainage conditions. The varied classes of material as determined by texture, including fine sandy loam, sandy loam, gravelly sandy loam, loam, and silt loam, have been mapped as soil types, such as the Ruston sandy loam, Ruston fine sandy loam, Ruston gravelly sandy loam, Louisa loam, Congaree silt loam, etc. These soil types have been shown on the accompanying map in different colors, the boundaries having been drawn as accurately as a fair rate of progress in the mapping admitted. It sometimes happens that patches of other soils, owing to their small extent, had to be included with soils mapped as individual types.

In the Piedmont Plateau the Louisa soils are the most important. These are characterized by the grayish to grayish-red or grayish-yellow color of the soils, by the red color and the brittle greasy feel of the clay subsoils, and by the frequent occurrence of varicolored soft weathered fragments of the parent slate rocks on the surface and through the soil section.

Small areas of the York soils, which differ from the Louisa soils in the yellow color of the subsoils, were mapped in close association with the Louisa. Occasional spots of Cecil loam were also encountered, but these were too small in extent to warrant their being mapped as a distinct type and were therefore thrown in with the Louisa loam, the type which they closely resemble in many characteristics and with which they are closely associated.

In the Coastal Plain section of the county the Ruston series is the most extensive group of soils. The determining characteristics of the Ruston soils are the prevalent gray color of the surface soils, and the reddish-yellow to yellowish-red or dull-red color and moderately friable structure of the usual sandy clay subsoil.

The Orangeburg soils differ from the Ruston in that their subsoils are always of a decidedly bright red color and friable structure. Apparently weathering has advanced farther in the former soils, with consequently more complete oxidation and reddening of the iron salts.

Another group of Coastal Plain soils is the Susquehanna series, the distinctive features of which are the plastic structure and usual mottled red and gray color of the subsoil.

There is a small development of the Norfolk loamy sand in the southern part of the county. This type has a yellow or bright yellow friable sandy clay subsoil.

The boundary between the Coastal Plain and the Piedmont division is not everywhere distinct. Formerly there was a mantle of Coastal Plain material overlying the Piedmont to a considerable distance north of the present boundary. This mantle has been largely removed by erosion, but here and there patches of Coastal Plain soils still exist as outliers north of the present boundary line separating these provinces. Many areas mapped as Piedmont soils have rounded gravel and stones over the surface, which represent the remnants of a former covering of sedimentary material. The Bradley sandy loam and gravelly sandy loam represent soils, the surface portion of which consists of grayish to yellowish sedimentary material like that of the Norfolk or Ruston, while the subsoil consists of yellowish-red to red residual clay from the Piedmont rocks, or material identical with the subsoil of the Louisa or Cecil.

The limestone soils are represented by a single series—the Clarksville. Only one type, the stony loam, is developed in the county. This has a grayish soil, a yellow silty clay subsoil, and angular chert fragments are common over the surface and through the soil material. This type is closely associated in occurrence with the Coastal Plain soils, and apparently—in some of the areas, at least—forms areas from which a former covering of Coastal Plain material has been washed off.

The Montevallo shale loam is a yellowish soil, passing below into red clay, which in turn is underlain by partially decomposed rock of the Montevallo shale formation, from which the material is derived.

In the Piedmont section of the county the stream-bottom soils are represented by the Congaree series. These have brown to reddish-brown soils and subsoils, occupy the first bottoms, and are subject to frequent overflows. The component materials of the Congaree soils have been derived principally from the upland residual soils of the Piedmont region. In the first bottoms of the Coastal Plain there are two series of soils: (1) The Ocklocknee or brownish colored types and (2) the Bibb or light-gray to nearly white types. Both of these are subject to overflow, but the latter has poorer drainage between overflows than the former, in consequence of which oxidation has been practically inhibited. The soils of these two series represent materials washed largely from the Coastal Plain uplands.

Meadow includes the poorly drained first-bottom alluvium which is so variable in texture, profile arrangement, and color as to preclude type or series separation.

Two series of soils are found on the stream terraces, the Cahaba and Kalmia. The Cahaba series is characterized by the prevailing reddish-brown to dull-red color of the subsoil and well-established drainage, while the Kalmia soils have yellow to mottled yellow and gray subsoils and are not so well drained. The Cahaba soils are more productive than the Kalmia, mainly on account of their better drainage conditions.

In the northwestern part of the county there are several narrow strips of light-gray first-bottom soils composed largely of wash materials from the Clarksville stony loam. These areas were mapped as Holly silt loam.

The characteristics of the several types mapped are brought out in detail, and their crop adaptations and proper methods of management pointed out in subsequent pages.

The survey of Chilton County shows that there are developed here a diversity of soils well adapted to the development of a permanent, profitable agriculture.

The following table gives the name and extent of each of the soil types mapped in the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Ruston sandy loam.....	134, 912	29.2	Ruston fine sandy loam.....	6, 720	1.4
Louisa loam.....	67, 200	14.5	Clarksville stony loam.....	5, 120	1.1
Orangeburg sandy loam.....	55, 552	12.9	Bradley sandy loam.....	4, 544	1.0
Deep phase.....	3, 968		Bibb sandy loam.....	3, 968	.9
Ruston gravelly sandy loam....	45, 568	9.9	Ocklocknee fine sandy loam....	3, 968	.9
Louisa slate loam.....	44, 160	9.5	Montevallo shale loam.....	3, 136	.7
Susquehanna fine sandy loam..	22, 976	5.0	York stony loam.....	2, 496	.5
Norfolk loamy sand.....	12, 608	2.7	Congaree silt loam.....	2, 432	.5
Kalmia sandy loam.....	11, 200	2.4	Holly silt loam.....	2, 240	.5
Orangeburg fine sandy loam....	10, 432	2.3	Bradley gravelly sandy loam..	1, 280	.3
Meadow.....	9, 280	2.0			
Cahaba sandy loam.....	8, 320	1.8	Total.....	462, 080

ORANGEBURG FINE SANDY LOAM.

The surface soil of the Orangeburg fine sandy loam consists of a gray or brownish loamy fine sand to fine sandy loam, varying in depth from 6 to 15 inches and averaging about 8 or 9 inches. The subsoil, which reaches its maximum clay content at about 24 to 30 inches, is a red, friable sandy clay. Below this the texture becomes coarser and the structure more open and porous.

The Orangeburg fine sandy loam, like the sandy loam, is derived from the sands and clays of Coastal Plain deposits. Owing to the severe erosion to which these deposits have been subjected since their

elevation above water, the surface of the type has become very uneven.

The type is not very extensive in Chilton County, the largest areas being developed in the southwestern part of the county on the line of Perry and Dallas Counties, and north of Maplesville, in the vicinity of Macedonia Church. Its topography varies from rolling to hilly. The drainage is good, in some instances excessive, the soil frequently suffering from the effects of surface washing. Where erosion has not been hindered the red sandy clay subsoil is exposed, but such areas were too small in extent to be mapped as a distinct type.

This soil is well adapted to general farming, giving excellent yields of cotton, corn, oats, cowpeas, peanuts, soy beans, vetch, clover, and grasses. It is peculiarly adapted to peaches, the Elberta produced upon it having an especially fine flavor and color. Cotton yields from one-half to three-fourths bale to the acre and corn from 15 to 20 bushels per acre.

Most of this type is under cultivation, but the more broken areas are still in forest, composed of a mixture of pine, hickory, blackjack oak, red oak, and dogwood.

Like the Orangeburg sandy loam, this soil ranges in value from \$15 to \$45 an acre, depending upon its state of improvement, location, and proximity to railroad towns.

ORANGEBURG SANDY LOAM.

The surface soil of the Orangeburg sandy loam is a grayish to reddish-brown, medium-textured sandy loam, from 8 to 15 inches deep, with an average depth of about 8 to 10 inches. The subsoil to a depth of about 36 inches is a bright red, friable sandy clay.

There are really two phases of this type, a light-colored phase, which is loose and coherent, and a dark or brownish phase, which is more loamy and compact. The latter phase resembles to some extent the Greenville sandy loam, but is more rolling, less loamy, and of a more grayish color. On the slopes and hillsides the soil is shallow and redder in color, while on the more elevated or unbroken areas it is deeper and of a lighter grayish color.

The Orangeburg sandy loam is derived from Coastal Plain deposits which have been much modified by weathering and by surface wash. It occurs mostly in the southwestern part of the county and is frequently associated with the Susquehanna fine sandy loam. There is very little variation in topography, which is usually rolling to slightly hilly, with the principal areas occupying the slopes where erosion has been more active. The drainage of this type is excellent, and in some instances excessive, especially in the deeper sandy phases. In many

cases numerous gullies have been formed, and on hillsides the surface soil has frequently been entirely washed away, exposing the underlying subsoil. This in itself ought to be sufficient proof that a good system of terracing, contour plowing, and the growing of cover crops, such as vetch, oats, and rye, is needed.

The native growth of this soil consists chiefly of long-leaf and short-leaf pine, post oak, blackjack oak, red oak, hickory, and dogwood.

This type is considered a good agricultural soil, and, with the exception of the gullied areas, is practically all under cultivation, cotton and corn being the leading crops. The heavy phases are classed as better cotton soils than the more sandy phases, yielding from one-half to three-fourths bale per acre. Corn, which is planted mostly on the lighter soil, yields from 15 to 20 bushels per acre. Cowpeas, velvet beans, oats, peanuts, sweet and Irish potatoes, and crimson clover do well. Sugar cane gives good yields, but the color and quality of the sirup are not equal to that secured on the Norfolk or the Ruston soils.

This soil is well suited to the growing of peaches, figs, plums, and strawberries, and with proper management profitable industries might be built up around their production.

A large percentage of the land is tilled by tenants, who devote it almost entirely to cotton and corn year after year, until it deteriorates to a point where the yields are no longer profitable. The land is then considered "worn out" and is abandoned. With a good system of crop rotation and intelligent methods of tilling and improving the soil the land would soon be made to double its present yields and abandoned fields would be unheard of.

Land of this type can be bought for \$15 to \$45 an acre, depending upon its proximity to towns and railroads and its state of improvement.

Orangeburg sandy loam, deep phase.—The surface soil of the Orangeburg sandy loam, deep phase, varies in depth from 4 to 8 inches and consists of a gray, loose, loamy sand to sandy loam of medium texture. The material below this is a loamy sand to sandy loam of a reddish color, which, at depths varying from 18 to 36 inches, grades into a dark-red sandy clay. The first 2 or 3 inches of virgin soil is rather dark, owing to the large content of organic matter. Beginning a few inches beneath the surface and extending to a depth of from 8 to 12 inches the soil is yellowish in color, changing gradually to reddish or to the deeper and more characteristic red color of the subsoil proper. Occasional fragments of mica and iron concretions are found in the soil.

The Orangeburg sandy loam, deep phase, is of sedimentary origin, having been formed by the weathering of the sands and clays of the

Coastal Plain deposits. It occurs in the southern part of the county on and near the boundary line between Chilton and Autauga Counties, near Buck Creek. Where associated with other members of the Orangeburg series it generally occupies the sides of slopes extending into narrow valleys, and its drainage is therefore excellent.

RUSTON SANDY LOAM.

The surface soil of the Ruston sandy loam consists of a gray to grayish-brown loamy sand to light sandy loam, underlain at a depth of 2 or 3 inches by a yellow or pale-yellow sandy loam. The subsoil, beginning at a depth of about 8 to 20 inches, is a reddish-yellow to yellowish-red or dull-red friable sandy clay loam to sandy clay. In the lower part of the 3-foot profile there is occasionally seen a faint mottling of yellowish or reddish brown. The depth of this soil varies considerably. On some of the lower gentle slopes and in slight depressions the depth to clay is frequently as much as 20 inches. On the other hand, the soil has been washed from slopes in such a way as to bring the clay subsoil very near or quite to the surface. Cultivated fields have not as a rule been affected by erosion, owing to the fact that the soil is capable of absorbing very large quantities of rain and the downward movement of the water under the influence of gravity is quite rapid, especially as compared with soils having denser clay subsoils, such as the Louisa, Cecil, and Susquehanna series. Gullies are seen here and there on some of the steeper slopes where the land has been carelessly handled for long periods. The task of protecting the soil against washing is very simple, the essential steps being to keep the soil well supplied with organic matter, plow deep, terrace the steeper slopes, and to keep the fields protected by winter cover crops.

The topography of this soil is characteristically gently rolling. There are occasional hills and ridges which stand well above the gentle upland level of the surrounding country, but on the other hand the type includes a good many relatively low-lying areas of flat, undulating surface configuration. A good idea of the prevailing topography is obtained when it is considered that there are but few areas too steep for efficient cultivation. The subsoil both in structure and texture favors the retention of a good supply of moisture, while the surface soil favors capillary movement of moisture from the subsoil reservoir upward to within reach of the plant roots.

The Ruston sandy loam is extensively developed throughout the Coastal Plains—that is, approximately over the western two-thirds of the country. The type is derived from sedimentary materials deposited by water in prehistoric times. It occupies an intermediate position, at least in color of the subsoil, between the Norfolk and Orangeburg soils, the former being the extensive Coastal Plain soils

having a yellow friable sandy clay subsoil. Small areas of Norfolk sandy loam are occasionally seen in Chilton County, but owing to their limited extent these were included with the Ruston sandy loam. The type also includes some patches of Ruston fine sandy loam and gravelly sandy loam too small to map.

The Ruston sandy loam is a valuable agricultural soil. It is easy to cultivate and keep in good condition, especially when the legumes are grown in rotation with other crops. Cotton, corn, oats, peanuts, cowpeas, velvet beans, soja beans, vetch, watermelons, cantaloupes, cucumbers, Irish potatoes, and sweet potatoes can be profitably grown with moderate applications of commercial fertilizers. Yields of from three-fourths bale to 1 bale of cotton, 40 to 65 bushels of corn, 40 to 50 bushels of oats, and 1 to 2 tons of cowpea hay are obtained with proper methods of cultivation, including moderate applications of mixtures of acid phosphate, cottonseed meal, kainit, and other potash salts. Fertilizers containing relatively high percentages of nitrogen and potash are recommended. Acreage applications of from 300 to 600 pounds of a 6-3-4 mixture have given good results with cotton, corn, peanuts, potatoes, sugar cane, cowpeas, and sweet and Irish potatoes.

Besides these general farm crops a number of early vegetables can be grown successfully. Cabbage, radishes, tomatoes, garden peas, beets, and lettuce do well with liberal applications of barnyard manure or a high-grade fertilizer mixture.

Peaches do nearly as well on this soil as on the Orangeburg sandy loam and fine sandy loam, which are the best peach soils of the Coastal Plain region of the South. Strawberries also thrive, particularly on those areas where the subsoil lies near the surface.

Land of this type of soil is valued at \$15 to \$40 an acre, depending on improvements and proximity to railroads and towns.

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

Mechanical analyses of Ruston sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413633.....	Soil.....	1.4	9.0	11.3	23.7	9.1	33.8	12.0
413634.....	Subsoil.....	1.2	7.1	8.9	19.4	9.0	29.9	24.3

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam is essentially the same as the Ruston sandy loam, differing chiefly in its finer texture. The surface soil to a depth of 8 to 10 inches is a gray to grayish-brown loamy fine

sand to light fine sandy loam, grading at a depth of 2 or 3 inches into a yellowish fine sandy loam. In timbered areas the immediate surface has a dark-gray color, owing to the relatively high content of organic matter. The subsoil is a friable, reddish-yellow to dull yellowish-red fine sandy clay, sometimes faintly mottled in the lower depths with yellow. Quartz pebbles are of common occurrence on the surface and throughout the soil section. The type includes occasional patches of Ruston sandy loam and Norfolk fine sandy loam too small to map on the scale used in the present survey.

The surface of the Ruston fine sandy loam, like that of the sandy loam, is generally moderately rolling. The types also resemble each other in their ability to absorb moisture. The drainage of the type is good, as a result of the rolling surface and the open structure of the soil material. Enough moisture is retained, however, to carry the crops through dry spells, provided the organic matter content of the soil is properly maintained at a point sufficiently high to give a friable structure.

Cotton, corn, oats, peanuts, cowpeas, velvet beans, soja beans, vetch, strawberries, sweet and Irish potatoes, peaches, and plums can be successfully grown on the Ruston fine sandy loam. Moderate applications of complete commercial fertilizers are required for good yields. The fertilizer treatment recommended for the Ruston sandy loam will be found effective in the case of this type.

A considerable proportion of this soil is under cultivation, mainly to cotton and corn. It is considered a good agricultural soil, having about the same crop value as the Ruston sandy loam.

Forested areas support a timber growth of longleaf and shortleaf pine, post oak, blackjack oak, hickory, and some persimmon. Blackjack oak is usually most abundant on the deep sandy areas.

RUSTON GRAVELLY SANDY LOAM.

The Ruston gravelly sandy loam, to a depth of 7 to 10 inches, is a loose, open-structured gray loamy sand or light sandy loam. The subsoil is a reddish-yellow to yellowish-red or reddish-brown friable sandy loam, occasionally mottled with shades of brown, and containing varying quantities of gravel. The surface is thickly strewn with rounded quartz gravel, ranging in size from fine gravel to pebbles an inch or more in diameter. Such coarse material is also present through the soil and subsoil, the quantity apparently decreasing with depth. Larger stones, which are few in number, are found. These consist of fragments of iron-cemented sandstone, which has formed locally. The lower portion of the soil becomes heavier in texture, and is usually a coarse sandy loam of a grayish-brown to yellowish color.

Owing to its open structure this type is subject to serious leaching, which, together with the prevailing rough and rolling to hilly topography, renders it less valuable as a whole for agricultural purposes than the smoother, denser, and finer textured Ruston types. Those areas, nevertheless, having a sufficiently smooth surface to admit of comparatively easy cultivation are fairly productive, especially where terraced to prevent erosion. With proper management, cotton, corn, oats, cowpeas, peanuts, and sweet potatoes give profitable results. Crops do not suffer as much from the effects of drought as the loose character of the soil would lead one to expect, the gravel acting as a surface mulch and retarding evaporation.

The native vegetation consists principally of longleaf pine, with more or less blackjack oak, especially on the sandy areas. Some of the more rolling land is best adapted for forestry, or for use as pasture when seeded to Bermuda grass. Certain varieties of peaches and grapes give good results on land of this character.

The soil is decidedly deficient in organic matter and would be improved by plowing under either rye, oats, or leguminous crops, such as cowpeas, vetch, or velvet beans. The latter not only add much valuable organic matter, but benefit the soil by storing in it nitrogen gathered from the air by bacteria existing upon their roots. Liberal applications of complete commercial fertilizers are decidedly profitable for cotton, corn, oats, and peanuts. A mixture of cottonseed meal, acid phosphate, and potash in the ratio of about 3-1-2 would give good results with cotton, corn, oats, and other crops. Acreage applications may range from 300 to 700 pounds, according to the crop and the condition of the soil.

This type of soil ranges in price from \$5 to \$20 an acre. Its value depends chiefly upon the quantity of longleaf pine upon it.

SUSQUEHANNA FINE SANDY LOAM.

The surface soil of the Susquehanna fine sandy loam is a grayish to light-brown fine sandy loam, with an average depth of 8 to 10 inches. The upper subsoil consists of a reddish-brown clay, which is very stiff and plastic when wet but hardens and clods on drying. Below 20 to 30 inches the subsoil is mottled red, gray, and yellow. Another distinct feature of the lower depths of the subsoil is the occurrence of stratified clay, which breaks up into white or grayish shalelike flakes or thin blocks. Owing to the presence of mica the subsoil has a slightly greasy feel.

The largest development of this type occurs in the western part of the county, north and northeast of Maplesville, where the country is rolling to broken. In the more level areas the drainage is poor,

the stiff, impervious nature of the subsoil retarding the movement of the soil water downward. Seasons of excessive rain, as well as drought, affect the crops on this soil.

Nearly all the areas under cultivation are used to grow cotton and corn. In good seasons and with proper management, including crop rotation, a fair yield of both can be obtained. The greater proportion of this type, however, is uncultivated and covered with a forest of pine, red oak, white oak, and hickory.

Farms composed of this type of soil bring from \$5 to \$15 an acre.

BIBB SANDY LOAM.

The Bibb sandy loam is a light-gray heavy sandy loam, grading downward into light-gray sandy loam to sandy loam, mottled with yellowish or brownish colors. Black iron concretions are frequently encountered in the subsoil.

This type is developed in the more poorly drained, overflowed first bottoms of streams in the Coastal Plain section of the county. Most of it is covered with tupelo gum, sweet gum, ironwood, maple, bay, holly, and numerous water-loving plants.

Although the source of the materials composing this soil is the same as that of the materials composing the Ocklocknee fine sandy loam, it is much less productive than the latter, because of its poorer drainage and less complete oxidation.

By ditching and protecting it from overflow this land could be used profitably for sugar cane, corn, and probably other crops, including oats and cowpeas. In its present condition it could be cleared and made to produce good yields of native grasses and Japan clover.

The establishment of better drainage conditions, followed by the application of 1 ton of burnt lime per acre, would certainly result in marked benefit to crops like corn, oats, and cotton. Acid phosphate would also probably prove beneficial.

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

Mechanical analyses of Bibb sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413639.....	Soil.....	0.2	2.3	10.6	36.1	13.7	26.0	10.9
413640.....	Subsoil.....	.1	4.2	16.1	32.5	10.9	21.8	14.3

OCKLOCKNEE FINE SANDY LOAM.

The Ocklocknee fine sandy loam consists of a brownish fine sandy loam, which grades at about 15 to 20 inches into a lighter brown fine sandy loam. In some instances, where the drainage is poor, the surface soil is grayish brown in color and the subsoil is a sandy clay or clay loam, somewhat mottled with gray or drab. Such areas represent an approach toward the Bibb fine sandy loam. The texture and color of the material is more uniform in the broader bottoms. In the narrower bottoms there is considerable color and texture variation.

This type occurs in the first bottoms of streams flowing through the Coastal Plain section of the county in strips varying from a few yards to about one-fourth of a mile in width. All of it is subject to overflow and the addition of deposits from such overflows. The component materials are derived from the soils of the Coastal Plain uplands.

A considerable proportion of this soil is used for cotton, good average yields being secured without fertilizers. Acid phosphate could possibly be used to advantage in hastening the maturity of cotton where the planting is late owing to poor drainage conditions. Much improvement would result from straightening and deepening stream channels and constructing levees to prevent flooding. Some areas could be improved by digging ditches along the base of upland slopes and leading them into the streams; others led through the slight depressions would fully repay the cost of their construction.

In years of moderate rainfall there should be no trouble in obtaining 75 to 100 bushels of corn to the acre from areas properly supplied with organic matter fertilized with 300 to 400 pounds of cottonseed meal and acid phosphate per acre. In addition to cotton and corn, Johnson grass, Bermuda grass, cowpeas, oats, soja beans, sugar cane, and sorghum can be profitably produced.

This is considered a valuable soil, and farms including broad strips of it are held at a higher price for that reason.

Forested areas of the type are covered principally with willow, sweet gum, pine, elder, alder, button bush, poplar, and bay.

NORFOLK LOAMY SAND.

The Norfolk loamy sand consists of about 10 inches of grayish loamy sand, which grades at lower depths into a yellowish loamy sand to light sandy loam. Occasionally there is a rather large percentage of coarse, angular sand in both soil and subsoil. As indicated in cuts, the material seems to be sufficiently coherent to stand

in perpendicular walls, but when broken it is loose and friable. Near stream courses iron concretions and gravel are often present.

This type is principally developed in the extreme southern part of the county, along the Mobile & Ohio Railroad, southeast of Pletcher, and along the Chilton and Autauga County line, southwest of Cooper. Small, isolated areas are found here and there as far north of the county line as Sandy Creek. The topography is flat to gently rolling, with sharp slopes along the streams and gullies.

The drainage is thorough and in many places excessive, and unless care is taken to conserve the moisture crops are likely to suffer during periods of drought. Owing to its loose, open structure, wet weather does not affect this soil as it does some of the other members of the series, and cultivation may be carried on immediately after rains. The soil is not retentive of fertilizer and heavy applications are necessary.

This soil is best adapted to snap beans, sweet corn, cowpeas, peanuts, soja beans, velvet beans, watermelons, cantaloupes, cucumbers, tomatoes, and a number of other vegetables. Peaches, plums, and figs yield well, and the quality of fruit is fine. In seasons of ample rainfall corn gives fair yields, averaging from 12 to 18 bushels per acre, but it is easily affected by drought. Oats yield from 15 to 20 bushels. Owing to the sandy nature and open structure of the soil, cotton does not do so well on it. Under the ordinary methods of farming cotton is very susceptible to rust. Heavy applications of potash fertilizers seem to be the most practicable remedy for this disease.

Cowpeas, peanuts, soy beans, and velvet beans should be grown more extensively, since they serve the double purpose of renovating the soil and furnishing valuable forage for hogs and cattle. They can frequently be planted so as to receive fairly good cultivation. If cotton is to be grown on this soil it should be planted only when the soil is in a high state of cultivation.

In the cultivation of this soil, as with most of the other sandy upland soils of the area, the land should be broken a little deeper the first year than has been the custom, and still deeper each successive year until a depth of 8 or 10 inches is reached. When a seed bed has once been prepared and the plants well started, cultivation should be as shallow as practicable, so that the roots may not be disturbed any more than can be helped. In order to subserve the two main objects of cultivation it is necessary that the soil should be stirred not more than 2 or 3 inches below the surface and then kept in a friable condition.

Only a small percentage of the Norfolk loamy sand is under cultivation. It is principally used for pasture. Its valuation depends mainly upon the character of the standing timber. Improved tracts near the railroads sell for \$10 to \$15 an acre.

KALMIA SANDY LOAM.

The Kalmia sandy loam, to a depth of 8 to 16 inches, is a gray to grayish-brown sandy loam, overlying a yellowish sandy clay, which at 24 to 30 inches becomes stiffer, lighter in color, and frequently mottled with gray, brown, and yellow. Finely divided mica is common in the lower depths of the subsoil.

This type is an alluvial soil, having been formed by the deposition of sand and finer materials by the streams along which it occurs. It occupies the first and second terraces along Big and Little Mulberry, Walnut, and Oakmulgee Creeks. The largest continuous body occurs along Big Mulberry Creek, in the western part of the county. It lies in terraces somewhat above the first bottoms, and is overflowed only during the higher floods. The soil is more thoroughly weathered than the bottom-land types.

The areas of Kalmia sandy loam, though generally flat, are naturally fairly well drained. In very rainy seasons, however, they are usually partially overflowed, and in order to obtain the best results artificial drainage is necessary. Open ditches are used exclusively for this purpose. Where large areas are cultivated it would be much better to use tile drains.

The forest growth upon this soil consists of longleaf and short-leaf pine, water oak, hickory, sweet gum, post oak, elm, and other deciduous trees and shrubs. Most of the merchantable trees have been removed and the land devoted to agriculture.

The Kalmia sandy loam is best adapted to corn, oats, and hay, but with good drainage fair yields of cotton are obtained. This soil retains fertilizers well and responds readily to their use. It can be improved by deep fall plowing and growing some crop such as vetch, bur clover, or even oats or rye, to be turned under as green manure or cut for hay before the time for planting corn and cotton. A variation of this method which gives satisfactory results is to turn under only that part of the land needed for the cotton rows and leave the intervening strips or balks of vetch or oats to mature for seed. As this type is adapted to both cotton and corn, they are sometimes made to form a two-year rotation, but the need of a three-crop or four-crop rotation is soon apparent and for this reason, if no other, the legumes should be grown more extensively.

This type is a good truck soil and where it is near enough to markets profitable returns could be secured from these crops. It is well suited to grasses. Bermuda and Johnson grass do exceptionally well. The type offers good opportunities for stock raising.

The Kalmia sandy loam is valued at \$20 to \$50 an acre, depending upon its location, state of improvement, and nearness to railroad towns.

CAHABA SANDY LOAM.

The Cahaba sandy loam consists of a grayish to reddish-brown light sandy loam, underlain at about 7 to 11 inches by a moderately friable reddish loam to sandy clay. The lower part of the subsoil is in many places mottled with rusty brown and yellowish-brown colors. The mottling is most pronounced in the poorer drained areas, which represent an approach or gradation toward the Kalmia sandy loam. Some small areas of Cahaba fine sandy loam, because of their small extent, were mapped with this type.

This type is developed on stream terraces of practically flat to gently undulating surface configuration, at an elevation precluding overflow, except in the case of some of the lower areas during occasional abnormal freshets. Drainage is well established over the main or typical portion of the type.

This soil represents old alluvium deposited when the streams were flowing at higher levels than at present. Owing to its longer exposure to the agencies of weathering, this alluvium has undergone a much greater change than the soil of the more frequently overflowed first bottoms, which is added to by the deposits of each succeeding flood. The greater weathering is shown by the more pronounced red color of the subsoil, which has resulted from oxidation of the included iron salts.

The Cahaba sandy loam is a valuable agricultural soil, being especially suited to the production of cotton, corn, oats, cowpeas, vetch, soja beans, peanuts, and sweet and Irish potatoes. All of this soil has been under cultivation for many years, principally to cotton and corn. Owing to its constant use without the addition of organic matter, it is deficient in humus and has a relatively low moisture-holding capacity. It is somewhat leachy and fertilizer effects are not lasting. By practicing crop rotation and including leguminous crops to be turned under the organic matter content can soon be replenished and the condition of the soil markedly improved. With sufficient organic matter in the soil to give it a coherent or loamy structure, fertilizers will be found to be more efficient. At present applications of low-grade mixtures, such as those having 8-2-2 or 10-2-2 formulas, are made at the rate of about 200 to 300 pounds per acre for cotton. Higher grade mixtures would be more profitable. Mixtures analyzing 8-3-4 have given satisfactory results on this type of soil with acreage applications of 350 to 500 pounds. Nitrogen should be supplied, in part at least, by growing the legumes. Mixtures of cottonseed meal, acid phosphate, and kainit or sulphate of potash can be prepared to advantage on the farm. With timely deep plowing, liberal additions of organic matter, and moderate applications of good complete fertilizer mixtures

from 50 to 75 bushels of corn per acre and relatively good yields of other crops should be secured on this valuable soil.

At present this land ranges in price from \$20 to \$50 an acre.

BRADLEY SANDY LOAM.

The Bradley sandy loam consists of a gray sandy loam of variable depth, usually ranging, however, from 6 to 12 inches. The texture of the sandy material varies from fine to medium, though here and there a considerable quantity of coarse sand is present. The subsoil is a yellowish-red to red clay, containing mica particles and some sand, and increasing in tenacity with depth. Angular quartz fragments are found throughout both the soil and subsoil, becoming more numerous with depth.

The surface portion of the type represents a mantle of Coastal Plain material; the underlying material is a residual clay. The material of the soil is identical or practically so with that of the Norfolk sandy loam. The subsoil is derived mainly from slate rock. It is the same as the subsoil of the Louisa soils. The type occupies an intermediate position between the Piedmont Plateau soils on the north and the Coastal Plain soils on the south. It is not extensively developed in Chilton County, only a few irregular and broken areas being found. Its greatest development is near the central part of the county, the largest body being found about 5 miles southeast of Clanton.

The type varies in topography from rolling to undulating. The more level areas are devoted to general farming. Cotton, corn, and oats are grown, but only fair yields are obtained. The soil is better adapted to vegetables than to these general farming crops. The tree growth consists principally of blackjack and red oak, longleaf and shortleaf pine, and hickory.

Farms on this type bring from \$8 to \$15 an acre.

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

Mechanical analyses of Bradley sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413621.....	Soil.....	3.3	9.0	10.4	33.5	19.3	17.2	7.4
413622.....	Subsoil.....	3.5	12.4	7.7	23.2	15.7	24.2	12.8

BRADLEY GRAVELLY SANDY LOAM.

The Bradley gravelly sandy loam is a light-gray or yellowish sandy loam, about 10 inches deep, containing from 25 to 50 per cent of rounded quartz gravel mostly less than 2 inches in diameter. The

subsoil is a stiff, red to yellowish-red clay, increasing in tenacity with depth, and containing mica particles and subangular fragments of rock. Like the Bradley sandy loam, it varies in topography from rolling to hilly. It is found in irregular, isolated bodies around the heads of streams, the largest area occurring just east of Mim Cross Roads. Like the Bradley sandy loam, the surface portion is sedimentary and the subsoil residual in origin.

At present none of the type in this county is under cultivation, and as it is not especially adapted to any particular crop it would seem advisable to encourage the growth of forest trees, which consist of oak, hickory, and pine. The value of this land now depends upon the character of the standing timber.

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

Mechanical analyses of Bradley gravelly sandy loam.

[Fine earth.]

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413619.....	Soil.....	2.5	13.9	7.5	11.4	9.9	44.0	10.8
413620.....	Subsoil.....	4.0	9.3	5.9	10.0	11.5	45.6	13.6

LOUISA LOAM.

The Louisa loam is a grayish-red loam or silty loam, grading in places toward a silty clay loam, underlain at a depth of about 5 to 10 inches by brittle red clay to silty clay, which usually has a greasy feel due to the presence of mica flakes. Occasionally the subsoil is slightly mottled with yellowish and pinkish material representing partially decomposed products of the parent rock formation. A few patches were included in the type in which the subsoil has a decidedly yellow color, such areas representing bodies of York silt loam too small to be shown on a map of the scale used in this survey.

This type is derived from what appear to be argillaceous slates. The slaty structure is distinct, the rocks usually splitting into thin leaves. These rocks on weathering assume pinkish-red, yellowish, and almost white colors. The weathered fragments are soft and easily broken. They are quite abundant on eroded slopes, in many places giving such areas the characteristics of a slate loam. The topography is characterized by numerous low, well-rounded hills and hillocks and low winding ridges, with gentle slopes. Some of the hills are relatively high, ranging from 100 to 150 feet above the valley floors.

The type was originally forested with pine, oak, hickory, and dogwood, and much of it still supports the virgin growth. Both the

surface drainage and underdrainage are good. Some of the steeper cultivated slopes have been eroded sufficiently to expose the clay subsoil, but as a rule the soil is sufficiently absorptive of rainfall to prevent ruinous erosion.

Moderate yields of cotton and corn are usually secured on the Louisa loam. It is capable of improvement, however, with proper management. This should include the rotation of crops, deep fall plowing, the planting of winter cover crops, and moderate applications of commercial fertilizers, preferably those rich in phosphoric acid and relatively low in potash. Addition of either ground limestone or burnt lime would increase the productiveness of the type. Some vegetable matter should be plowed under occasionally. Ground phosphate rock could be successfully used, especially with liberal additions of vegetable matter.

LOUISA SLATE LOAM.

The surface soil of the Louisa slate loam is a grayish-brown to slightly reddish-brown silty loam, from 6 to 8 inches deep, becoming heavier and a deeper red with depth. The subsoil is a brittle, stiff red clay, having a greasy feel caused by mica.

The surface is strewn with slabs and smaller fragments of the parent rock, which consists chiefly of a bluish-gray slate, usually having a pearly luster. Many fragments are reddish or yellowish in color. There is also present considerable warped or twisted rock of about the same character, but having more nearly the appearance of schist. These rocks as seen on the surface, where they are more or less weathered, are soft. Fragments of quartz and quartzose schist are also present.

Some spots of Louisa loam, gravelly loam, and fine sandy loam, in which the slate fragments were not conspicuous and which were too small to map, were included in this type.

The topography of the Louisa slate loam varies from rolling to steeply rolling or slightly hilly. As the river is approached the surface becomes more uneven, and there are numerous rounded hills of uneven height. At other places, where there is a steep slope or sudden drop to the river's edge, there is no true bottom land, the river passing through a gorgelike channel. The type is forested mainly with blackjack oak and pine.

Under ordinary methods of management the type gives fair yields of corn, oats, and cowpeas. but with better treatment, including fall plowing and the occasional turning under of legumes, especially cowpeas and bur clover, the land is readily improved to the point of yielding about three-fourths bale of cotton and probably 25 bushels or more of corn to the acre. For such yields applications of commercial fertilizers or barnyard manure are necessary. A

mixture of cottonseed meal and acid phosphate, in the proportion of 1 part of the former to 2 of the latter, applied at the rate of 300 to 500 pounds to the acre, gives good results with cotton or corn, as well as with wheat or oats. At present this land can be bought for about \$10 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Louisa slate loam:

Mechanical analyses of Louisa slate loam.

[Fine earth.]

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413627.....	Soil.....	5.4	6.4	2.3	5.4	3.4	56.4	20.5
13628.....	Subsoil....	4.0	6.3	2.7	7.1	5.3	46.2	28.5

YORK STONY LOAM.

The surface soil of the York stony loam is gray or a pale-yellow loam to sandy loam, grading abruptly into a sandy clay loam. The subsoil, beginning at about 10 inches, is a yellow clay or silty clay, containing enough fragments of partially decomposed slate rock and quartz to give it a decided gravelly character. The surface is thickly strewn with large and small fragments of quartzose schist, usually of a mottled pinkish and grayish color. These fragments are disseminated throughout the soil section in such quantities as to make cultivation difficult. In places the type grades into the silt loam of the series. No separation was made between the stony loam and the silt loam, owing to the intricate association of the areas and the small differences in agricultural value. Certain sandy areas are also found. These simply represent a sandy phase or areas not of sufficient importance to be shown as a distinct type.

The soil is derived from schistos or slaty rock and quartzose schist. It occurs in rather small, isolated areas and occupies hills and slopes. To the north of Clanton it caps the tops of the hills along Yellow Leaf Creek. Most of it is forested with longleaf and shortleaf pine, blackjack oak, and hickory.

The type is of low agricultural value. It can be used for the production of cotton and corn, but probably is better adapted for Bermuda grass pastures and forestry. On some of the favorably situated areas peaches could be grown profitably.

At present this land ranges in value from \$3 to \$10 an acre, the price depending mainly on the quantity and quality of standing timber.

The table following gives the results of mechanical analyses of samples of the soil and subsoil of the York stony loam.

Mechanical analyses of York stony loam.

[Fine earth.]

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413611.....	Soil.....	6.2	7.9	2.8	5.0	4.0	67.6	6.5
413612.....	Subsoil.....	2.2	3.5	1.9	3.8	4.5	65.0	19.2

CONGAREE SILT LOAM.

The Congaree silt loam is a brown to reddish-brown silt loam, grading downward into a lighter material, usually of a light, sandy texture. In some of the broader bottoms there is frequently little change in color or structure from the surface downward, with the exception of more or less yellowish, brownish, or grayish mottling in the poorer drained areas. In some of the narrow bottoms considerable variation in the texture of both soil and subsoil is found, patches of fine sandy loam or sandy loam occurring in many places. Along the outer margins an overwash of sandy material is not uncommon.

This soil occurs in the first bottoms of streams in the Piedmont section of the country, and consists of deposits from the overflow waters of the streams. The materials forming these deposits have come from the residual upland soils of the region. The Congaree silt loam is subject to frequent overflows and much of it is poorly drained, especially along the smaller streams. The drainage could be improved by deepening and straightening the streams and by leading ditches across the bottoms into the streams. In some places it would be advantageous to construct ditches along the outer margins of bottoms to intercept the drainage from the adjacent uplands.

Good yields of corn and grass are obtained on this soil without the use of commercial fertilizers. Cotton does well, especially in dry years. Many areas could be profitably utilized in the production of Johnson grass and Bermuda grass for hay. Cowpeas, sugar cane, sorghum, cabbage, and Irish potatoes do well.

Below are given the results of mechanical analyses of samples of the soil and subsoil of the Congaree silt loam:

Mechanical analyses of Congaree silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413617.....	Soil.....	3.3	13.4	9.1	13.5	9.0	42.7	8.7
413618.....	Subsoil.....	3.9	10.4	6.4	12.3	10.6	41.3	15.0

CLARKSVILLE STONY LOAM.

The Clarksville stony loam consists of a grayish-brown loam to heavy sandy loam, which grades at about 3 to 6 inches into a yellow silty clay. Small fragments of quartz and flintlike chert are abundant in both soil and subsoil and the surface is thickly strewn with pink, gray, and mottled pink and gray chert and grayish to white quartz fragments, some of which are 6 or 8 inches or more in diameter. These are sufficiently abundant to render cultivation difficult.

The type is derived from the occasional outcrops of cherty limestones. There are a number of isolated and comparatively small areas in the northwestern part of the county. The most southernly development is nearly west of Jemison, where areas occupy hills and slopes. Practically all the type is covered with longleaf and shortleaf pine, blackjack and post oak, and hickory.

In places the soil is really a stony sandy loam, but no attempt was made to separate these areas. There is no important agricultural difference in these and typical areas.

This soil is of low agricultural value, owing to its stony nature and rolling topography. Areas favorably situated with respect to shipping stations could no doubt be used profitably for cotton. Cantaloupes and strawberries of the minor crops should do well. In cultivating this land the larger stone fragments should be removed.

Land of this type can be bought at a very low price, probably less than \$10 an acre, unless the forest growth warrants a higher valuation. There is very little of it in cultivation at present.

MONTEVALLO SHALE LOAM.

The Montevallo shale loam consists of a yellowish-red clay loam, grading at about 5 or 6 inches into a red, brittle clay, which in turn passes into partially decomposed, variegated shale at about 20 to 30 inches. Shale fragments are conspicuous on the surface and are disseminated throughout the soil and subsoil.

The type occurs in narrow strips along streams and slopes and is well drained. Where the shale substratum comes near the surface crops suffer in dry weather from lack of moisture.

This soil is derived from the underlying Montevallo shales, which are varicolored, the most conspicuous colors being pink, deep red, yellowish, and grayish. It is only of ordinary agricultural value, being best suited to small grains, particularly oats.

Land of this type of soil can be bought for \$5 to \$10 an acre.

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

Mechanical analyses of Montevallo shale loam.

[Fine earth.]

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413613.....	Soil.....	6.5	12.0	8.1	15.2	5.0	36.2	16.8
413614.....	Subsoil.....	5.1	7.8	4.2	9.8	5.2	42.7	24.9

HOLLY SILT LOAM.

The Holly silt loam is a grayish, compact silt loam to silty clay loam, which grades abruptly into a mottled yellow and gray clay loam or silty clay loam. Iron oxide concretions are encountered in the subsoil.

This type represents stream-deposited material derived largely from the Clarksville soils. The areas are flat and subject to overflow and in general poorly drained.

With ditching, plowing, and heavy liming (about 1 ton of burnt lime per acre) the type would produce good crops of corn and oats. In its present state it is best suited to the grasses.

Below are given the results of mechanical analyses of samples of the soil and subsoil of the Holly silt loam:

Mechanical analyses of Holly silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
413615.....	Soil.....	3.1	9.6	6.9	14.8	9.1	41.5	15.0
413616.....	Subsoil.....	2.9	5.9	4.1	6.9	9.2	40.7	30.4

MEADOW.

Along most of the stream courses in the county there are narrow strips of flat, low-lying, poorly drained soil mapped as Meadow. In their present condition these areas are mainly unsuited for farming. This soil consists of wash materials from the soils of the various uplands deposited during freshets. There is a wide variation in the texture, profile, arrangement, and color of the material. Along the smaller streams it is usually quite sandy and varies considerably in short distances. The character of the surface soil in any given spot along the stream courses is largely influenced by that of the surround-

ing uplands. Some places show a reddish color, which indicates washings from the red hills, while others show a dark-brown to nearly black color. Along Big and Little Mulberry and Buck Creeks, especially Little Mulberry, the soil is somewhat more uniform.

If this land were cleared of brush and the streams were opened up and straightened it would resemble the Ocklocknee soils. By removing the trees and underbrush and encouraging the growth of grass its value for pasture would be greatly increased.

Small patches of Muck too small to be mapped on the scale of 1 inch to the mile were encountered in these bottoms, and along the outer edges of the Meadow areas narrow strips of sand and light sandy loam are found in places. These are better drained than the most of the type and well suited to the growing of sugar cane, producing a sirup of light color and excellent quality.

Aside from its use for grazing, Meadow is valued chiefly for its timber, consisting principally of hickory, oak, elm, gum, cypress, and ironwood.

SUMMARY.

Chilton County, Ala., is situated near the geographical center of the State. It has an area of 722 square miles, or 462,080 acres.

Clanton is the chief town and county seat, with a population of about 1,500. Other important towns are Maplesville, Thorsby, Jemison, Riderville, Verbena, Mountain Creek, and Stanton.

The climatic conditions are favorable to a diversified type of agriculture. The mean annual rainfall of 47.18 inches is well distributed and a long growing season favors succession cropping.

Cotton and corn comprise the chief crops, with oats, sugar cane, sweet potatoes, cowpeas, peanuts, and grasses for hay as secondary crops used for home consumption.

Between 40 and 45 per cent of the county is at present in cultivation, the area in farms having increased 42,422 acres during the last decade. About 40 per cent of the land is farmed by tenants. The average value of farm lands is about \$20 an acre. In 1910 the value of farm property, including livestock, was \$4,437,151.

The development of water-power sites along the Coosa River promises an extension of the home market. Birmingham, Montgomery, Tuscaloosa, and Atlanta are southern markets within easy reach of the county. Two lines of railroad give outlet to the markets of the South, North, and West.

The principal industries are agricultural. Cotton and corn are the leading products. Cotton is at present the money crop. While the acreage of corn is considerable, the production does not meet the home demand.

Oats, potatoes, peanuts, forage, and hay crops are not extensively grown. Very little attention is given to stock raising. The supply of such commodities as meat, dairy and poultry products, hay and grain, is insufficient to meet the needs of the county.

Some attention is given to fruit and truck growing—strawberries, peaches, watermelons, and cantaloupes being the principal products shipped. With the favorable conditions and the steady demand these special crops should become much more important.

Twenty-one types of soil were mapped. They are divided into four general divisions—the Piedmont soils, of the eastern third of the county; the Coastal Plain soils, lying to the west of the Piedmont; the limestone soils, of the northwestern part of the county, and the alluvial soils found on the terraces and bottoms along the streams in the several divisions mentioned.

The Orangeburg sandy loam and fine sandy loam occur mostly in the southern part of the county. The fine sandy loam is best suited for cotton, with the sandy loam next in order. The deep phase of the sandy loam is best adapted to corn and truck crops.

The three types of Ruston soils, the sandy loam, fine sandy loam, and gravelly sandy loam, are closely related to the Orangeburg soils in origin. They are not so well adapted to cotton and corn.

Of the Susquehanna series the fine sandy loam is the only type mapped in the area. It is developed in two phases. The shallow phase is better suited to cotton production, while the deeper, sandier phase gives better results with corn, cowpeas, and velvet beans.

The Bibb sandy loam, which occurs in the first bottoms of the Coastal Plain region, is a poorly drained, overflowed soil. Where artificially drained it is well suited to sugar cane, corn, and grass crops.

The Ocklocknee fine sandy loam is the only type of this series mapped. It represents an accumulation of materials washed from the Coastal Plain uplands. It is naturally a very fertile soil, but its agricultural value depends largely upon drainage.

Of the Norfolk series the loamy sand, which occurs in the southeastern part of the county, is the only type mapped. This is a rather coarse, light-textured soil. Its value as an agricultural soil locally depends upon whether the subsoil is sufficiently heavy to retain moisture. It is best suited to truck crops.

The Kalmia series is represented by the sandy loam. It is one of the better drained bottom-land types, and well adapted to corn, potatoes, watermelons, cantaloupes, and cucumbers.

The Cahaba sandy loam is extensively developed along the larger streams in the western part of the county. It is a second-bottom type, and where properly drained is highly valued for corn and cotton.

The Bradley series is represented by two types, the sandy loam and the gravelly sandy loam. These soils are of small extent and little importance. The sandy loam seems to be best adapted to general farming. Some of the slopes of the gravelly sandy loam may prove good sites for orchards and vineyards.

Of the Louisa series two types were mapped, the loam and slate loam. Both occur principally in the northern and eastern parts of the county, along the Coosa River. The Louisa loam is the best cotton soil as crops on the slate loam do not withstand drought very well.

The York stony loam occurs in small, isolated areas in the north-eastern part of the county. It has a low agricultural value, and is better adapted to the production of peaches and grapes than to use for the general farm crops.

The Congaree silt loam occurs as low-lying, first-bottom land along the streams in the Piedmont. It is subject to overflows and poorly drained. When properly drained this soil is well suited to cotton, corn, and oats.

The Clarksville stony loam occupies knobs and slopes of ridges in the northwestern part of the county. Owing to its stony nature it is difficult to cultivate and not very productive.

The Montevallo shale loam is also found in the northwestern part of the county. It is well drained, but has a low agricultural value. It is best adapted to oats and other small grains.

The Holly silt loam is an alluvial type composed of materials washed from the Clarksville series. It occurs as first bottoms along the streams in the vicinity of Minooka. It is subject to frequent overflow, is poorly drained, and better suited to use as pastures than in the cultivation of tilled crops.



[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.]

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.