Issued October 10, 1910.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF SALUDA COUNTY, SOUTH CAROLINA.

BY

W. E. McLENDON.

[Advance Sheets—Field Operations of the Bureau of Soils, 1909.]

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1910.

[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.]

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., June 7, 1910.

SIR: During the field season of 1909 a soil survey was made of Saluda County, S. C. The work in this area was requested by citizens of the county and bore the indorsement of Hon. J. O. Patterson, within whose district the county lies.

I have the honor to transmit herewith the manuscript report and map covering this work and to request their publication as advance sheets of Field Operations of the Bureau of Soils for 1909, as authorized by law.

Very respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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SOIL SURVEY OF SALUDA COUNTY, SOUTH CAROLINA.

By W. E. McLENDON.

DESCRIPTION OF THE AREA.

Saluda County comprises an area of 283,520 acres, or 443 square miles, situated in the central-western portion of South Carolina. It is included within parallels 33° 49′ and 34° 12′ north latitude and meridians 81° 28′ and 82° west longitude. On the north it is bounded by Newberry County, on the east by Lexington and Aiken counties, on the south by Edgefield County, and on the west by Edgefield and

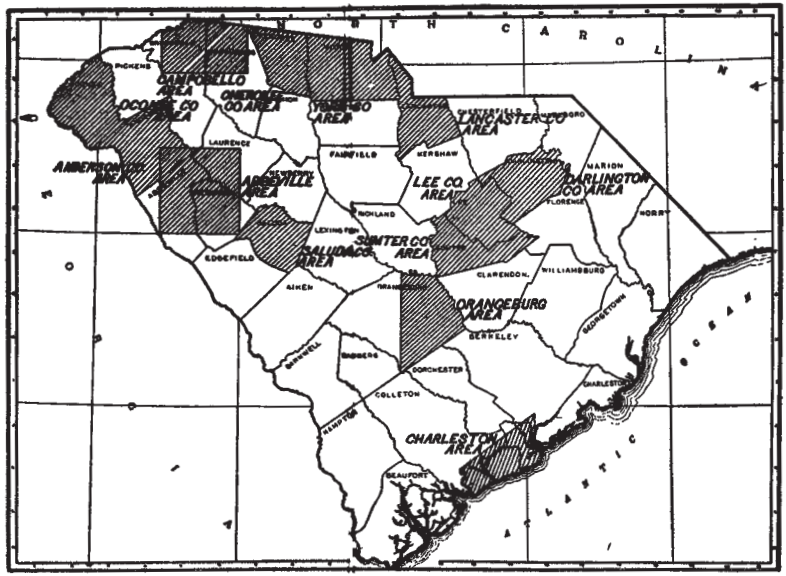

FIG. 1.—Sketch map showing location of the Saluda County area, South Carolina.

Greenwood counties. Its center is about 44 miles due west of Columbia and the same distance, slightly east of north, from Augusta.

All of the county is in the Piedmont Plateau, except a narrow strip along the southern edge, which extends into the Coastal Plain. Each of these divisions is quite distinct in its topographic features. The Coastal Plain strip, or "the ridge," as it is locally called, is the most prominent feature in the landscape, forming as it does the crest

of the general drainage divide between the Saluda River on the north and the Edisto River on the south. The surface features are level to gently undulating until the edge is reached where it breaks away to the Piedmont. Looking north from this Coastal Plain ridge, the Piedmont region has the appearance of a vast plain much dissected by intricate stream systems of varying magnitude. The larger streams have numerous laterals of considerable length, and these in turn are fed by spring branches radiating out so as to reach every area of any size. The streams are rapid flowing and as a rule have very narrow overflow lands. Some of the slopes immediately along the streams are rather abrupt and undesirable for farming purposes, but most of them are gradual and give collectively a moderately rolling topography with differences in elevation of 25 to 150 feet between the streams and the crests of the ridges. A prominent ridge, dividing the drainage of the Saluda and Savannah rivers, extends in a northwest-southeast direction across the western edge. From this and the ridge along the southern edge, the two being continuous, the Piedmont has a gradual slope to the north and east at the rate of about 6 feet to the mile, the same as the rate of fall in the streams. Along the Saluda River in the northeastern corner of the county the elevation is about 300 feet above sea level, while along the main drainage divides it ranges from 500 to 550 feet.

The drainage of the county is effected by three systems of streams, but a glance at the accompanying map will show that most of it reaches the Saluda River through the Little Saluda River and smaller tributaries. Halfway Swamp is a tributary of the Saluda draining a small section west to the Greenwood County line. Farther south the western edge drains to the west through tributaries of Turkey Creek, which empties into the Savannah River, and a narrow strip along the southern border drains south into the Edisto River. Practically all of the remaining territory is drained by the Little Saluda and its tributaries, emptying into the Saluda River about 5 miles west of the extreme eastern corner of the county. Clouds, Miner, Red Bank, and Big creeks are the principal tributaries of the Little Saluda River.

Saluda County was cut off from old Edgefield County and separately organized in 1895. At the time there was no town near enough the center to make the county seat, so the town of Saluda was founded for this purpose, and it is now a place of some 300 inhabitants, although 12 miles from the railroad. The present population consists very largely of the descendants of the early settlers and their slaves. From the early settlements, which extended back before Revolutionary times, there was a general preference shown for the sandy lands in both the southern and northern por-

tions of the county. This led to their better development and it was here that most of the old plantations were found. The heavier lands, which are much more extensive, were not considered as desirable, and even now they are only sparsely settled, except in local communities. In 1900 the total population of the county was 18,966, about equally divided between whites and negroes.

The interests of the county are almost purely agricultural, there being no factories except two cotton-seed oil mills, and not more than 1,000 of the inhabitants live in towns. Ridge Spring, in the southern part of the county, is the largest place, with about 500 inhabitants. Monetta and Ward are smaller places, 4 miles east and west of Ridge Spring, respectively. Batesburg, with a population of about 2,000, touches the county on the east, and 2 miles northeast of Batesburg is the town of Leesville, which is almost as large. Johnston, with a population of about 2,000, is 9 miles west of Ridge Spring, just over the line in Edgefield County.

The railroad facilities are not adequate for the proper development of the county. The only line entering the county is the Southern Railway connecting Columbia and Augusta, which crosses the southeastern corner. It passes through the towns of Leesville, Batesburg, Monetta, Ridge Spring, Ward, and Johnston, which are the marketing centers for about two-thirds of the county. The Columbia and Greenville branch of the Southern gives an outlet for the northwestern corner at Chappells and Oldtown, just across the Saluda River. A small amount of trade reaches Newberry and Prosperity, farther north in Newberry County, and Ninety Six, over in Greenwood County. A large section in the center of the county would be much better served if there were a railroad to Saluda from either Johnston or Ward.

The county has an extensive system of public roads, but most of them are very indifferent and during the winter months are almost impassable. With the best of railroad facilities it is very important to have good roads, and it becomes doubly important in the absence of such facilities.

All of the farm products are sold in the local markets, except the peaches and vegetables grown in the southern part, which go mostly to Washington, Pittsburg, Philadelphia, Baltimore, New York, and other points north. Columbia and Augusta are the largest cities near the county.

CLIMATE.

The climate of the region is characterized by long, hot summers and short, mild winters and is intermediate between that of the lower flat region of the Coastal Plain and the upper Piedmont nearer the mountains. Some winters are accompanied by a light snowfall

during January and February, which are the coldest months in the year. Again, there may not be any snowfall, and only a few short spells when the temperature goes much below freezing. The ground occasionally freezes to a depth of 3 to 5 inches, resulting in considerable damage to the oat crop, especially on the lighter soils. Ordinarily spring opens in early March, and by the middle of the month the danger of frosts has about passed. The spring months are mild and pleasant until the middle of June, when the hot summer weather usually begins, lasting as a rule until well into September. The temperature through the summer rises to 90° F. or above nearly every day, but the really oppressive weather does not last more than a week or so during July and August. Generally the fall months are dry and very pleasant, a condition favorable to the gathering of crops. The average date of the first killing frost in the fall is about November 10, but frost severe enough to retard vegetable growth may be expected at any time after October 20.

Some idea of the climatic conditions can be had from the table below, which was compiled from records of the Weather Bureau station at Trenton, in Edgefield County. The amount and distribution of the rainfall over the entire county is about the same as at Trenton, but there are some differences in the temperature of different parts of the county as a result of differences in elevation and topographic features. The ridge along the southern edge of the county is less subject to late frosts than farther north through the Piedmont, on account of the higher altitude, and the valleys are more subject to frosts than the ridges, even where the general elevation is not so high. The comparative freedom from spring frosts along this Coastal Plain ridge has led to the successful development of the peach industry, whereas no attempt at peach growing is made through the Piedmont.

The average annual precipitation is near 52 inches. July and August are the wettest as well as the hottest months of the summer. February has nearly 9 inches precipitation, which almost equals that of December, January, and March combined. The growing season ranges from seven and one-half to eight months long. As a whole the climate is mild, pleasant, and very favorable to plant growth.

Normal monthly, seasonal, and annual temperature and precipitation at Trenton, Edgefield County.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
December	47	72	8	3.5	3.3	5.7	0.9
January	47	73	9	3.6	3.6	3.9	0.4
February	47	75	− 4	7.0	8.7	3.5	2.6
Winter	47			14.1	15.6	13.1	3.9
March	57	87	21	4.1	2.3	4.3	T.
April	63	91	33	3.8	2.0	6.7	0.0
May	73	98	42	2.7	1.8	5.9	0.0
Spring	64			10.6	6.1	16.9	T.
June	79	99	53	4.8	3.5	7.2	0.0
July	81	104	58	5.7	8.8	3.3	0.0
August	80	101	60	6.6	2.9	8.0	0.0
Summer	80			17.1	15.2	18.5	0.0
September	76	98	48	3.7	3.6	7.2	0.0
October	65	87	32	3.6	0.8	2.9	0.0
November	56	79	24	3.0	3.1	1.1	T.
Fall	66			10.3	7.5	11.2	T.
Year	64	104	− 4	52.1	44.4	59.7	3.9

AGRICULTURE.

The agricultural development of Saluda County has been along the general lines characteristic of all of the inland section of the State. The first settlers, who were mostly hunters, trappers, and traders, were soon followed by others who devoted most of their time to herding or collecting cattle and driving them to Charleston and other distant markets. Along with this began permanent settlement, with farming as the chief means of livelihood. Gradually there developed the system of agriculture which prevailed without any marked changes until the beginning of the civil war. Corn, wheat, and oats soon became the main crops, although many others were grown in a limited way for home consumption. Every farmer gave some attention to the raising of stock, chiefly cattle, hogs, and sheep, and used the extensive timbered areas for pasturage. Land being cheap and plentiful, not much effort was made to keep the soil in a productive state. If a field came to a point where it would not produce profitable crops it would be abandoned and new land cleared to take its

place, this being especially true on the old slave plantations where labor was at hand. Some of these old abandoned fields and others that had to be deserted during the war grew up in shortleaf pine and have never since been cleared. In spite of the careless methods a very substantial prosperity existed. The sandy lands, being easily handled, were then as now the most extensively farmed and best developed.

The old order of things was greatly changed by the civil war. The necessity for a crop that would command a ready price in the market became paramount, and cotton was turned to for this purpose. Before the war there was comparatively little cotton grown, because the cotton gin had not been perfected and the removing of the seed from the lint was very slow and tedious. But with the growing importance of the crop came better methods of handling it, until the modern gins of to-day were developed. Practically all of the farmers had to buy their supplies on credit and generally at exorbitant prices. Liens on the crop and mortgages on the lands and home were given as security. These obligations had to be met promptly in the fall, and the only way the farmers had to do it was to plant cotton, which could be marketed as soon as gathered. This led more and more into the growing of cotton, with a corresponding decline in the attention given to stock raising and the growing of corn, wheat, oats, grasses, and such other crops as were needed on the farm. With very little stock, other than the work animals, there was not much manure to return to the soil, and the methods of tillage and cultivation were in general careless. After years of such management the soils declined in productiveness to a point where the yields were no longer profitable, and the use of commercial fertilizers was begun.

For a long time after the war the majority of the farmers found it hard to make more than a bare living and a great deal of the land changed hands through the foreclosure of mortgages. As a further hindrance to the agricultural progress a great many of the landowners moved away from the farms and turned the cultivation over to tenants.

In the last twelve years, owing in a large measure to the better prices paid for cotton, a decided improvement has taken place. Only a small percentage of the farms are heavily mortgaged and the majority of the farmers are operating more nearly on a cash basis. Many new houses are building and other signs of prosperity are to be seen on all sides. The antiquated types of implements and machinery are giving way gradually to the latest improved types. Yet with all this the possibilities in the county have not been realized. The soils are not producing on an average half the yields they should, and the advantages of diversified farming are almost entirely neglected. The soils and climatic conditions favor a variety of farming

interests. Stock raising, now receiving scarcely any attention, should be an important feature on every farm, especially in the Piedmont section, where there is a great deal of land that can better be used for pasturage than for anything else. Here the raising of beef cattle, hogs, and sheep are industries that should be extensively developed, and there seems to be no reason why the raising of mules and horses would not likewise prove profitable.

Some idea of the extent of development in the county and relative importance of the different crops can be had from the figures given in the 1900 census reports. Of 256,709 acres in farms only 116,909 acres were reported as improved. There were 40,761 acres in cotton, producing 17,520 bales; 31,872 acres in corn, producing 305,190 bushels; 13,464 acres in oats, producing 160,990 bushels; and 7,475 acres in wheat, producing 50,210 bushels. All of the other crops combined, including rye, clover, cowpeas, grasses, sorghum, sugar cane, peas, sweet and Irish potatoes, beans, peanuts, etc., covered less than 4,000 acres. According to this the average yield of cotton is about two-fifths bale to the acre, whereas under better methods it should be fully twice as much. The same low yields are observed in the other crops. The average yield of corn is about 10 bushels, oats 12 bushels, and wheat 7 bushels per acre.

The total value of the forest products, including lumber, cross-ties, shingles, wood, etc., was reported at $48,568. Vast tracts are still forested and a great deal of the timber is merchantable. On the sandy soils in the southern part of the county the longleaf pine constitutes the principal growth, while in the northern part of the county and even on the heavier soils farther south shortleaf pine and different varieties of oak predominate.

Since 1900 the growing of vegetables for the market has developed on a small scale in the southern part of the county. The main crops grown are asparagus, lettuce, beans, and peas. These products are shipped to the northern markets. The growing of peaches in the same section has proved very profitable, although the industry has never become extensive. Soon after the peach growing was started the San Jose scale appeared and spread rapidly. Where the little trees were attacked they either were killed outright or badly stunted, and considerable damage was done in the older orchards. The farmers became somewhat discouraged and for a time it looked as if the industry would be abandoned entirely, but successful methods of combating the scale have given the industry new life. Brown rot and nematodes also have given some trouble, but they have not become serious pests. The profits from the best orchards are expected to reach $200 or more an acre, whenever there is a fair crop. The varieties most popular are the Greensboro, Carmen, Connet, Georgia, and Elberta, named in the order in which they ripen. The Greens-

boro begins to ripen about May 25 and the Elberta about the middle of July. Other varieties, including St. John, Tillotson, and Chinese Cling, do well, but are not grown to any extent.

Lands intended for cotton or corn are left bare during the winter months and practically no plowing is done until early spring. Greater thoroughness is needed in the preparation of the soil for practically all of the crops grown. The cotton and corn lands first should be given a deep, thorough breaking with a two-horse turning plow, then harrowed to good tilth if inclined to be harsh and cloddy, before the rows are laid off. The planting should be done on as nearly level ground as possible, so that the latest improved harrows and cultivators can be used, thus saving both time and labor, besides minimizing the loss of moisture through evaporation. Every effort should be made to reduce the amount of hoeing, because it is slow and laborious. Too often the farmers plant their crops and attempt to prepare the land afterwards, when they are supposed to be cultivating the crop. All of the cultivation should be shallow, especially after the crops have attained some size, because deep cultivation keeps the feeding roots pruned off when the plants need them to get the necessary nourishment for a good, healthy growth. While it is necessary to cultivate to keep down grasses and weeds, the main object of cultivation is to conserve the moisture in the soil, hence the necessity for stirring the surface as soon as the soil is in condition after rains. Evaporation is very rapid from a compact surface, but with a layer of loose soil forming a mulch the soil below gives up its moisture much more gradually. Corn that has every promise of making a good crop is often ruined by using a turning plow toward laying-by time. The pruning of the roots proves very harmful, unless rains follow soon afterwards, and even then some injury is done. The plan of laying by the cotton early, when it is growing and fruiting rapidly, is a serious mistake and often means the difference between profit and loss. At no other season does the plant need more moisture and regularly than at this time. It is not advisable to try to cultivate close up to the stalks, where the growth is at all rank, but shallow cultivations through the middles would prove very beneficial as long as the plants are setting fruit. The first object should be to get a good stalk and the second to have the stalk well filled with fruit. A large growth without the fruit is an unnecessary drain upon the land.

What has been said in regard to the preparation of the soil for cotton and corn applies equally well to wheat and oats and other crops. If wheat or oats follow corn, cotton, or peavine stubble, where the soil has been prepared thoroughly for the previous crops, it is not necessary to do more than go over the field once or twice with a disk harrow. On the other hand, if the soil is not in good condition it should be given a deep breaking with a turning plow

and then harrowed to good tilth. Poor preparation is largely responsible for the low yields of these crops.

The present system of breaking the land shallow and to practically the same depth year after year has resulted in some unfavorable conditions. If the soil is sandy after a time nearly all of the finer material is removed by surface wash. It is deficient in humus, droughty, and has very little capacity for holding mineral fertilizers. The deep sandy soils are not greatly benefited by deeper plowing, except occasionally, but those with a clay subsoil within reach of the plow are greatly improved by plowing up a small amount of the clay every year and mixing it with the soil. If the clay lands are plowed to the same depth for some time a hard plow sole is formed just below the soil, which is more or less impervious to moisture and impenetrable to the roots of plants. The clay and loam lands are naturally very retentive of moisture, if the soil has considerable depth, but where it is shallow crops suffer from drought fully as much as on the sandy types. Another bad feature of shallow plowing is the tendency to increase erosion.

Not much attention is given to the rotation of crops, either as a means of increasing the resources of the farm or of keeping the soil in a productive state. Cotton may follow cotton for a number of years. Corn and cotton may alternate in an irregular way. Without seeking any new crops it would be possible for the farmers to practice a systematic rotation that would keep the soils in a productive state without the extensive use of commercial fertilizers. An important factor in maintaining soil in a productive state is to keep it well supplied with humus. This can not be done with a one-crop system. In a two-crop system planting to cotton two years and to corn one year, organic matter can be supplied by sowing cowpeas in the corn at the last cultivation. A better rotation would be to plant cotton one or two years, corn one year, and oats and cowpeas the next. On the heavier soils wheat can be substituted for oats. After the third year, cotton, or seed in grass to stand two years.

The only special soil adaptations recognized by the farmers of Saluda County are in connection with the growing of peaches and truck in the southern part of the county. The tendency with nearly all of the farmers is to grow the same general line of crops regardless of the different kinds of soil they have. Wheat is grown on the coarse sandy as well as on the heavy soils. Many areas now cultivated through the Piedmont would prove more profitable pasture if sodded to Bermuda grass.

The expenditure of Saluda County farmers for commercial fertilizers amounts to about $100,000 a year. Fertilizers are used on all of the cotton land and to some extent for corn and other crops. For cotton the applications range from 150 to 600 pounds to the acre.

A great many use complete fertilizers, some acid phosphate and kainit, others a mixture of cotton-seed meal, acid phosphate, and kainit in varying proportions. Practice has shown that the red clay lands and the sandy lands with a red clay subsoil near the surface respond but little to potash fertilizers, while the gray sandy soils with yellowish clay subsoils are benefited much more decidedly where stable manure is applied, or where the crop follows a good growth of cowpeas a fertilizer with little if any nitrogen may be used. Cotton-seed meal mixed with a small proportion of acid phosphate and kainit makes the best corn fertilizer. In addition to the usual application of fertilizer at planting time, some give a top dressing of nitrate of soda at the rate of 50 to 100 pounds to the acre. It is not good economy to use cotton seed as a fertilizer. It should be exchanged for cotton-seed meal, as in this way a good price is obtained for the oil which has no fertilizing value. Where seed is used as fertilizer it should first be killed by composting or allowing to heat in bulk, because if it is applied green unless covered very deeply it will sprout. All of the nourishment of the young seed goes into the young plant, which, after it begins to grow, has no more value as a fertilizer than some of the other weeds of the field. In general commercial fertilizers give the best results on soils deeply and thoroughly prepared and well supplied with humus.

The farms vary quite widely in size. Many of the larger holdings contain from 500 to 1,000 or more acres. By far the greater number contain from 100 to 300 acres. The average size of the farms as operated, including all tenant holdings as farms, is about 90 acres. Slightly over one-third of the farms are operated by the owners. The others are handled by white and colored tenants.

Several systems of tenantry are practiced. Rents range from $50 to $175, or the equivalent in lint cotton, for a one-horse farm containing from 20 to 30 acres of cultivable land. By the acre the rate ranges from $3 to $8, depending upon the quality of the land and nearness to town. Share cropping is also practiced. Where the owner furnishes the land, house, and fertilizers he usually gets half of the crop, or if he furnishes the land, stock, and implements he gets one-half to two-thirds. A very large proportion of the labor is absorbed in the tenant system. Through the sandier sections, however, where most of the negroes are found, the farmers can get all the help they need at 50 to 75 cents a day, or if by the month at $10 to $13, with board or rations and a house. In the thinly settled regions the farmers depend upon their families very largely for the necessary help.

The choicest lands near the railroad are considered rather high, but out through the thinly settled sections, extending over a very large

portion of the county, the prices are still quite reasonable. Within the last ten years nearly all land has doubled in value, and the prices are still rising. The best sandy lands along the southern edge of the county are held at $50 to $100 an acre. The Piedmont sandy types range from $25 to $60 an acre. The two types mapped as Cecil loam and Durham fine sandy loam, which together are very extensive, can in general be bought for $15 to $30 an acre.

SOILS.

Each of the two main physical divisions of the county is occupied by a distinct group of soils. In the Coastal Plain division the soils are derived from old unconsolidated sedimentary deposits known geologically as the Lafayette formation and consisting for the most part of yellowish-brown and red sandy clays veneered with 4 to 36 inches or more of sandy loams and sands. Local areas, as a result of poor drainage, have dark loamy soils and gray mottled sandy clay subsoils. Following out the differences in the color and structural properties of the clays, the general Coastal Plain group is further divided into three subgroups or series, with one or more types in each series. The red clay areas are classed as the Orangeburg sandy loam, those with yellow clay underlying them were mapped as the Norfolk sand and the Norfolk sandy loam, and the wet, poorly drained spots as the Portsmouth loam.

In the Piedmont region a different order of things prevails. The soils are derived from the weathering of very ancient metamorphic and igneous rocks ranging in texture from very fine-grained slates to coarse granites. By far the most extensive of these is a talcose slate occupying at least three-fourths of the total area of the county. Associated with and very closely related to the slate is a siliceous talcose schist. The schist has its most extensive development in the southern half of the county, but numerous small areas occur farther north through the region underlain by slate. Along the northern edge of the county, west of Bouknights Ferry, is a strip of gray medium-grained gneiss ranging from one-half mile to 3 miles in width. Other areas of the same kind of gneiss occur in the southern part of the county, where also are found considerable areas of a gray medium-grained granite. The only other formation of any consequence is a coarse porphyritic granite. This occupies an area of several square miles in the eastern part of the county, to the west and northwest of Batesburg. A small area almost circular in shape occurs about a mile northwest of Saluda.

The marked differences in the texture and composition of the original rocks give rise to salient differences in the derived soils. The rocks of a highly siliceous character weather into gray silty

and sandy soils with yellow clay subsoils, while those of a darker color which have greater amounts of iron-bearing minerals give gray to brown soils with red clay subsoils. In places the two different colors may be observed in soils derived from the same rock formation either as a result of variations in its composition or possibly of some slight difference in the drainage conditions. The soils with yellow subsoils are members of the Durham series and those with red subsoils belong to the Cecil series. As is the case with the Norfolk and Orangeburg soils in the Coastal Plain, the soils with yellow clay subsoils are sandier and less productive than soils of corresponding texture underlain by red clays.

The talcose slate weathers into the Cecil loam and the Cecil clay; the talcose schist, into the Durham fine sandy loam; and the gneiss, into the Cecil sandy loam, a sandy phase of the Cecil clay, and small areas of the Durham sandy loam. The coarse porphyritic granite gives both the Cecil coarse sandy loam and the Durham coarse sandy loam.

Along nearly all of the streams are narrow strips of alluvial land which, on account of their wet condition and variable texture, could not be separated into individual types. These areas are all grouped as Meadow.

Including Meadow, twelve types of soil were recognized, the name and extent of each being given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil loam	169,088	59.6	Durham coarse sandy loam	6,080	2.1
Durham fine sandy loam	34,880	12.3	Durham sandy loam	5,504	1.9
Cecil clay	29,760	10.5	Cecil coarse sandy loam	3,648	1.3
Norfolk sandy loam	9,472	3.3	Norfolk sand	512	.2
Meadow	9,408	3.3	Portsmouth loam	128	.1
Orangeburg sandy loam	7,808	2.8			
Cecil sandy loam	7,232	2.6	Total	283,520	

NORFOLK SANDY LOAM.

The Norfolk sandy loam, to a depth of 4 to 6 inches, is a gray loamy sand or light sandy loam. Material of about the same texture but of a light-yellowish color extends to a depth of 12 to 24 inches, where it grades into the subsoil proper, which is a yellow or reddish-yellow friable sandy clay, extending to a depth of several feet. Within 3 feet of the surface the clay is of uniform color, but lower down it becomes quite mottled and streaked with gray, brown, and red color. The average depth to clay is about 15 inches. Where it is from 20 to 24 inches deep, as is the case in small areas, the soil is of a loose sandy

and rather droughty nature. The most desirable areas are those with the clay nearest the surface, because here the moisture conditions are better and the soil is less subject to excessive leaching. Except in small areas especially cared for, the soil is deficient in humus.

The Norfolk sandy loam occurs along the southern and eastern edges of the county as one of the important types of the ridge or Coastal Plain strip. Between Batesburg and Monetta it occupies nearly all of the leveler lands of the ridge up to the very edge of the Piedmont, but west of the latter place it is confined to a narrow strip mostly south of the railroad, giving way on the north to areas of the Orangeburg sandy loam. The surface features are level or nearly so and the natural drainage is good, except in scattering depressions which have no outlet.

This type is derived from the sands and clays of the Lafayette formation. The Norfolk sandy loam is closely associated with the Orangeburg sandy loam and has essentially the same surface and drainage features, but there is a fundamental difference between the two, causing the subsoil of one to be yellow and the other a pronounced red. It is noticeable that the yellow clay is more siliceous and covered deeper with sandy material than the red clay.

Nearly all of the Norfolk sandy loam is under cultivation and has been since the early days of settlement. When first farmed it was more productive than now, owing in a large measure to a higher humus content, and fairly good crops were produced without the use of commercial fertilizers. As the humus of the soil has been depleted by planting continuously to clean culture crops, there has been a corresponding decrease in the yields until they are no longer satisfactory, even with liberal applications of commercial fertilizers. Corn and cotton are the main crops, the former yielding from 15 to 30 bushels and the latter from one-third to 1 bale per acre. The sandy character of the soil adapts it to some of the more intensive methods of growing corn, somewhat after the Williamson plan, by which from 50 to 100 bushels per acre could be produced at not much greater cost than the present yields. Small patches of oats, sorghum, cowpeas, and a few other crops are grown for home use. A limited acreage is also being devoted to the growing of peaches and early truck for the northern markets, and the results indicate that the type is best adapted to this line of farming. The peach trees make a vigorous growth if properly fertilized and cared for and the fruit generally is of excellent shipping quality. Asparagus, beans, peas, tomatoes, and Irish potatoes give very good returns. Asparagus has proved especially profitable with a few of the best farmers. With the general crops it is very desirable that a systematic rotation be practiced, so as to keep the soil well supplied with humus.

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

Mechanical analyses of Norfolk sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21058	Soil	7.1	26.7	11.0	28.3	14.5	8.0	3.9
21059	Subsoil	3.7	13.7	8.4	25.8	12.3	9.3	26.3

NORFOLK SAND.

The Norfolk sand consists of 4 to 6 inches of a light-gray sand of medium texture, underlain to a depth of 3 to 5 feet by a pale yellowish sand of about the same texture. Below the sand is a yellowish-brown sandy clay of the same character as that forming the subsoil of the Norfolk sandy loam. The slightly loamy character and darker color of the soil is due to the presence of a small amount of organic matter. The underlying sand is of a loose, incoherent nature until within a few inches of the clay, where it becomes more loamy. The soil is droughty for any of the shallow-rooted crops, and while it responds quickly to applications of manure or commercial fertilizers the effects are not lasting on account of the open, leachy character of the soil materials.

The Norfolk sand is of very little consequence in Saluda County, but is extensive in the adjoining counties of Aiken, Lexington, and Edgefield. The largest area mapped, just north of Monetta, contains about 100 acres. Another area less than half this size is found about halfway between Monetta and Ridge Spring. Then to the southwest of Ridge Spring are two other small areas, all aggregating less than a square mile.

The origin of the type is the same as that of the Norfolk sandy loam, but only includes the areas where the underlying clay is 3 feet or more below the surface. The surface features are level to gently undulating and the natural drainage is good.

About half of the type is cleared, the remainder is covered with a charactertistic growth of scrubby longleaf pine, post oak, and blackjack oak, and parts of the areas under cultivation are devoted to cotton and corn, which give very light and uncertain yields. The area between Monetta and Ridge Spring was set out in peach trees a few years ago. The fruit is of excellent flavor and ships well, but the trees have not received proper attention, and as a result they are dying from the ravages of San Jose scale, borers, etc. The trees will not live as long on this type of soil as on the heavier sandy types, but with good care the industry should prove profitable on the more

desirable areas. The best use for this soil is in growing watermelons and early truck, which mature before the dry hot weather of midsummer.

In the following table are given the results of mechanical analysis of the soil of the Norfolk sand:

Mechanical analysis of Norfolk sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21060	Soil	5.0	22.2	14.5	38.0	8.5	8.5	3.4

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam consists of 4 to 10 inches of a brownish-gray to brown sandy loam, underlain to a depth of 10 to 15 feet by a brick-red friable sandy clay. The average depth to clay is about 5 inches, and in such areas the soil is loamy and has a pronounced brownish cast, while in the deeper areas it is correspondingly sandier and lighter colored.

A phase of minor importance is found where the topography is inclined to be rolling. Some of the iron in the clay has separated out as concretions ranging from minute particles up to pieces nearly an inch in diameter, and in the gradual lowering of the surface by erosion a considerable quantity of these have accumulated in the soil. This has given rise to the local name "gravelly lands." Other spots too small to be shown on the map have had about all of the sandy covering removed and are now virtually a clay.

This type is derived from the red clay areas of the Lafayette formation, and occurs only in the southern part of the county. Its greatest development is in an irregular strip extending west from Monetta along the railroad. The next largest area is found north of Monetta beyond Clouds Creek. Smaller areas occur to the north and south of Ward and between Monetta and Batesburg. The surface features range from level to gently sloping. Large tracts are almost perfectly level and offer the best conditions for the use of improved machinery.

About all of the type is under cultivation, but before it was cleared it supported a heavy growth of timber, consisting of different varieties of oak, intermixed with longleaf pine. It is one of the most desirable soils in the State for general farming and has also proved especially adapted to the growing of peaches. It is no more productive than the Cecil sandy loam of the Piedmont region, but it has the advantage of leveler topography, making it easier to till and to keep in a

high state of cultivation. The areas with a sandy covering of 6 inches or less are considered the most desirable, because they are more drought resistant and easier to maintain in a productive state than the sandier areas. The yield of cotton ranges from one-half to three-fourths bale, of corn from 20 to 40 bushels, and of oats from 30 to 50 bushels per acre. With good management the same type of soil in other counties of the State has been made to produce 2 bales of cotton, 80 bushels of corn, and 75 bushels of oats per acre, and this can be done as easily here. Wheat would do equally as well as oats if not better. Cowpeas produce heavily and should be grown much more extensively both as a forage crop and as a soil improver.

The growing of peaches for the market began on this type at Ridge Spring some fifteen years ago, when the price of cotton was very low. The industry promised much, but after a few years began to dwindle on account of the San Jose scale and other insect enemies and diseases, which the farmer did not at that time know how to combat. The methods of controlling the scale and preventing the diseases are better understood now, and so it is expected that a much larger acreage will be devoted to peach growing than at any time in the past. The crops of 1908 and 1909, where the trees were properly cared for, were very profitable. The fruit is firmer and more highly colored than on any of the other types tried.

To make this type much more productive than it is under the prevailing system of management, it is only necessary to break the land thoroughly every year and increase the depth from 1 to 2 inches with each breaking until the soil has a depth of about 10 inches. With the added amount of clay in the soil it would become a true loam, capable of absorbing and retaining large amounts of moisture. It will be found, too, that as the clay content of the soil is increased it will hold organic matter better and retain larger proportions of the mineral fertilizers within reach of the plant roots. A systematic rotation of crops should be practiced in order to keep the soil well supplied with humus.

The following table gives the results of mechanical analyses of the soil and subsoil of the Orangeburg sandy loam.

Mechanical analyses of Orangeburg sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21061	Soil	3.1	14.7	7.5	40.5	18.4	10.3	5.5
21062	Subsoil	1.7	9.0	5.8	25.9	13.1	10.1	34.9

PORTSMOUTH LOAM.

The Portsmouth loam is somewhat variable in texture, but may be described in general as a black loam or heavy sandy loam, underlain at an average depth of 7 or 8 inches by a gray mottled sandy clay of a clammy, impervious character. The soil contains a relatively large proportion of organic matter, but clods badly in plowing on account of poor drainage conditions.

The type includes several small depressions through the Orangeburg and Norfolk types. Having no drainage outlets, these depressions are wet the year round and at times they become badly waterlogged. Some of them are heavily timbered with loblolly pine and gum. Other areas have had about all of the timber removed, but they are not farmed to any extent.

This type, while very limited, could be easily drained and converted into very valuable land. With good drainage it would produce heavy yields of oats, corn, and forage crops. It could also be used to advantage in growing celery, onions, and cabbage. When drained heavy applications of lime will prove very beneficial.

CECIL SANDY LOAM.

The soil of the Cecil sandy loam is a gray to brown medium-textured sandy loam with an average depth of about 6 inches. It varies from a brown sandy loam 4 inches deep to a gray lighter sandy loam ranging to maximum depths of 10 or 12 inches. In the deeper areas only the surface 4 or 5 inches are gray, while the material below is brown or yellowish brown. The subsoil is a red clay carrying a large percentage of sand of the different grades, though stiff and rather compact in its properties. The clay extends to a depth of 5 to 10 feet with little or no change in color or texture, then begins to get lighter and less coherent, grading finally into the parent rock in a soft weathered state. Locally solid bed rock is found near the surface, but more generally this soft material extends to great depths uninterrupted except by quartz veins, which occur with varying frequency all through the subsoil. The surface is strewn with angular quartz fragments, as a result of the crumbling of these veins at the surface, but the quantity present is not sufficient to change materially the properties of the soil or to interfere seriously with tillage. A noticeable content of mica occurs in both the soil and subsoil.

The Cecil sandy loam occurs in two sections of the county. The largest area extends along the northern edge, bordering the Saluda River between Bouknights Ferry and the Greenwood County line. The other areas are found along the southern edge of the Piedmont, forming an irregular strip between Batesburg and Ward. The surface features are of a moderately rolling character. Scarcely an acre

is perfectly level and only small scattering spots, generally along streams, are too rough to be farmed successfully to cultivated crops. The rolling features of the type and its sandy nature make it very susceptible to erosion. In fact, the extent of the type is decreasing every year from this cause, with a corresponding increase in the extent of the Cecil clay. This could be largely checked by careful terracing.

The Cecil sandy loam is a residual soil from a gray gneiss or gneissoid granite consisting of orthoclase and plagioclase feldspars, quartz, and muscovite and biotite mica, named in the order of their importance. Local areas in the southern part of the county are derived from a gray massive granite of about the same composition. The Cecil sandy loam typically is derived from the more massive phases of the gneiss, and becomes somewhat heavier where the rock is inclined to be schisty.

The timber growth consists of shortleaf pine, red, white, Spanish and post oak, and an undergrowth of dogwood, etc.

About all of the type is under cultivation. It is easily tilled, readily kept in a high state of cultivation, and considered the most desirable soil in the Piedmont section of the county for general farming. Stock raising and dairy farming are profitable industries that are not being followed on a commercial scale. Cotton is the first crop in acreage and importance and corn is second. Wheat and oats are grown, but they are secondary crops with the majority of the farmers. Among the other crops grown on a limited scale for home consumption may be mentioned sorghum for sirup and forage, sweet potatoes, cowpeas, and vegetables. Under the prevailing system of management the average yield of cotton is between one-third and one-half bale per acre. Corn yields from 15 to 30 bushels, oats from 20 to 40 bushels, and wheat from 6 to 15 bushels per acre. A few farmers have found little difficulty in securing a bale of cotton per acre and correspondingly increased yields of all the other crops. Commercial fertilizers are in general use for cotton and some make applications to the wheat, oat, and corn land.

The soil needs deeper and more thorough tillage than is now generally practiced, and a system of rotation should be followed that will keep it well supplied with humus. The present system of planting continuously to cotton, or any other crop for that matter, and applying commercial fertilizers alone will never be attended with the best results. To insure profitable returns a greater diversity of crops should be grown. In this way not only would the resources of the farm be increased, but also an economical means of permanently improving the soil would be provided. Any rough areas that can not be protected from erosion by terracing should be devoted to pasturage, sowing Bermuda grass, which makes a tough sod and at the same time provides good grazing.

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

Mechanical analyses of Cecil sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21043	Soil	8.4	23.3	10.8	28.3	14.8	9.9	4.7
21044	Subsoil	2.1	11.8	6.7	16.4	8.2	17.3	38.7

CECIL COARSE SANDY LOAM.

The soil of the Cecil coarse sandy loam, to a depth of 5 or 6 inches, is a brownish-gray to brown coarse sandy loam. A large percentage of the sandy material ranges from very fine to medium in texture, but there is enough coarse quartz sand and fine angular gravel present to give it the properties of a coarse sandy loam. The subsoil consists of a compact red clay, which also contains a considerable quantity of coarse sand and fine gravel. The depth of the clay varies from nothing, where the parent rock outcrops, to 10 or more feet in other places. Large orbicular masses of granite, many of which are over 20 feet in diameter, are scattered over the surface. Some of them are almost entirely above ground, while others have only the upper part showing. The variation is from almost pure rock outcrop in small areas, generally less than an acre in extent, to tracts of several acres where there is not stone enough to interfere seriously with cultivation.

This type has never been encountered anywhere else by the soil survey, and it is not extensive in Saluda County. Very likely other areas will be found as the work progresses. It occurs in the eastern part of the county to the north and west of Batesburg. Beginning due west of Batesburg an irregular strip extends north along Clouds Creek for a distance of about 8 miles, then swings to the east across to West Creek. The narrower slopes are quite rolling and irregular in topography, but back from the streams in the larger areas the surface features are level or gently rolling.

The parent rock is a gray coarse-grained granite with a porphyritic structure. The Cecil coarse sandy loam is derived mainly from the darker phases, which carry a higher percentage of iron-bearing minerals. If lighter colored and of a more siliceous character it weathers into the Durham coarse sandy loam. In places, however, the redder color of the Cecil areas seems to be due entirely to more thorough drainage.

About half of the type is under cultivation, the remainder being forested with a mixed growth of oak and pine. The timbered areas

are confined largely to the rougher slopes and very stony areas. These, if cleared and planted to Bermuda grass, would make excellent pasture lands. The cultivated areas are used for general farming, with cotton and corn as the principal crops. Wheat and oats are also grown to some extent. The average yields are about as good as on the Cecil sandy loam, especially during a wet year. During dry weather it is not able to tide crops over as well as the Cecil sandy loam, on account of its very shallow, open-structured soil and compact subsoil. Cotton yields from one-fourth to three-fourths bale, corn from 15 to 30 bushels, wheat 6 to 12 bushels, and oats from 20 to 40 bushels per acre. As with the other types of the county, the soil needs to be better supplied with humus. This can best be done by the rotation of crops and by keeping as much stock—cattle, sheep, and hogs—on the farm as possible. The rough areas, unfit for cultivation, would afford ample pasturage.

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

Mechanical analyses of Cecil coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21041	Soil	15.0	24.0	10.3	17.0	6.8	18.4	8.5
21042	Subsoil	5.0	8.6	3.2	5.1	1.4	25.4	51.3

CECIL LOAM.

The Cecil loam typically consists of 5 to 7 inches of a brown, very fine loam, underlain to a depth of 5 or more feet by a stiff, red, silty clay. Small quantities of quartz fragments are strewn over the surface and mingled with the soil, and veins of the same material occur with varying frequency throughout the subsoil.

An extensive phase of the type has a brownish-gray, heavy, very fine sandy loam or silty loam soil with a depth of 6 to 8 inches, resting on a stiff clay subsoil, mainly red, but showing numerous local spots of yellowish-brown, extending to a depth of 3 to 5 feet and there giving way to bed rock. Areas of various sizes all through this phase are thickly strewn with quartz rock, while others close by have little or none. In other areas, where there has been considerable erosion, the soil contains fragments of slate and the clay passes, at a depth of 3 or 4 feet, into masses of partially weathered slate. Through the type are also local light-colored areas very similar to the Durham fine sandy loam. Some small areas have the texture of a silt loam and some are reddish to reddish-brown in color. The soil has a marked capacity for retaining moisture and can be farmed with a

fair degree of ease. It is capable of being brought to a high state of cultivation, especially the more desirable areas, including the typical soil and the phase with the red subsoil.

The Cecil loam has a greater extent than all of the other types combined. It forms large tracts to the exclusion of any other type, except perhaps scattering areas of the Cecil clay, which is of the same origin. The topography consists of an intricate system of rounded ridges and intervening narrow valleys from 25 to 150 feet deep. Where the streams are numerous the topography generally is quite rolling and the slopes are subject to severe erosion, but throughout some of the larger areas with but few streams the main ridges are comparatively flat along their crests. It is on these wide ridges, as a rule, that the typical soil is found, as for instance, around Fruit Hill, Limp, Owdoms, Eulala, and to the north of Big Creek. The drainage is good everywhere, except in small areas on some of the slopes and lower hillsides affected slightly by seepage. Such areas have small iron concretions scattered through the soil and subsoil and are often referred to as "gray pimply land" and "black pimply land," depending upon whether the soil is light or dark in color. On account of the inadequate drainage, such areas have a yellow instead of a red subsoil.

The Cecil loam is derived from a greenish or dark-gray talcose slate. The rock is comparatively soft, but weathers very slowly, as is shown by its nearness to the surface. On beginning to decay it changes from greenish to a light-gray or drab color.

In the southern half of the county, where the type is associated with the Durham fine sandy loam, the timber growth is mixed. Some areas have a good growth of longleaf pine, and others a mixed growth of shortleaf pine and oak. North of the town of Saluda the longleaf pine disappears entirely and shortleaf pine and oak form the principal growth. Probably not more than half of the type is under cultivation.

The only crops grown to any extent are cotton, corn, oats, and wheat, named in the order of their acreage. Cotton yields from one-fourth to two-thirds bale, corn from 15 to 30 bushels, oats from 20 to 50 bushels, and wheat from 7 to 15 bushels per acre. Wheat and oats are secondary crops, except with a few farmers, who are growing them on an extensive scale. Cowpeas and sorghum make excellent forage crops. If the soil was put in proper condition, clover and a variety of grasses could be grown very successfully. The least desirable areas, including those with bed rock near the surface, should be sowed with Bermuda grass and used for pasturage. The areas troubled with seepage should either be drained or abandoned for cultivated crops. When drained a liberal application of lime would

prove beneficial. Japan clover and wild grasses take to these areas and produce good pasturage without any attention.

The following table gives the results of mechanical analyses of fine-earth samples of the soil and subsoil of the Cecil loam:

Mechanical analyses of Cecil loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21047	Soil	2.2	2.3	1.2	6.9	26.1	48.4	12.7
21048	Subsoil	.0	.5	.5	3.3	7.0	35.5	53.1

CECIL CLAY.

The Cecil clay typically consists of 3 to 5 inches of a reddish-brown clay loam or heavy loam, underlain to a depth of several feet by a dark-red heavy clay. The surface of the fields under cultivation is somewhat spotted. Some areas have a shallow loamy soil of a reddish-brown color while as many others have the raw clay coming to the immediate surface. A small quantity of quartz fragments is found strewn over the surface and in a great many places partially weathered fragments of the parent rock occur. The subsoil to a depth of 3 to 5 feet is comparatively free from stone, except for occasional thin quartz veins, but lower down the clay gradually passes into partially weathered rock which occurs mostly in thin layers.

A sandy phase of the type of limited extent occurs in the southern and northern portions of the county, the areas being closely associated with the Cecil sandy loam. These areas are derived from gneiss and the same rock giving the Cecil sandy loam, and in fact they are the direct result of erosion of areas originally covered with a sandy loam top soil. The surface 2 to 4 inches consists of a reddish-brown heavy sandy loam, overlying a deep-red clay, considerably more sandy than the typical subsoil. As in the typical areas the surface is strewn with quartz fragments, and veins of the same material occur with varying frequency through the subsoil.

The typical areas occur scattered about through the Cecil loam belt, generally on the steeper slopes where the severest erosion takes place. Some areas, however, occur back from the streams and are comparatively level. These represent the original soil as left after the process of weathering. One of the largest areas of the type occurs in the northern part of the county, the areas being between the Cecil loam and the Cecil sandy loam. Another area not quite so large occurs in the fork of Clouds Creek and the Little Saluda River.

The principal tree growth consists of shortleaf pine and oak, the former appearing somewhat scrubby.

The sandy phase of the type is nearly all under cultivation and used for the same general line of crops as the Cecil sandy loam. The

heavy phase is less generally farmed on account of the greater difficulty in handling it and the fact that so much of it is very rolling. When the seasons are very favorable the yields are fully as good as on the Cecil sandy loam, but year in and year out the sandy areas are considered the safer soil and are preferred because they are so much easier handled. With the introduction of better types of plows the clay lands will be more highly prized. With deep thorough plowing, even though the soil does not contain much humus, it will tide crops over long droughts without serious injury. As it is now generally handled there is very little soil to hold moisture or to furnish room for the roots of the plants. Consequently the yields are often very light. It is recognized as a better soil for cotton than for corn. The average yield of cotton is hardly one-half bale and of corn 10 to 20 bushels per acre. Where the soil is well prepared and properly fertilized it yields a bale of cotton and from 25 to 40 bushels of corn per acre. Small areas are devoted to wheat and oats, which generally give rather light yields. With a deep, well-prepared seed bed it ought to produce good crops of wheat. Clover and grasses would do well if properly started. The rougher hillsides, now considered worthless, could be converted into good grazing lands by sowing Bermuda grass. In fact, no better use could be made of the entire type than getting it well sodded with Bermuda grass and using it for pasture.

The following table gives the results of mechanical analysis of a fine-earth sample of the soil of this type:

Mechanical analysis of Cecil clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21049	Soil	0.2	1.5	2.0	6.0	2.7	37.5	50.1

DURHAM COARSE SANDY LOAM.

The Durham coarse sandy loam, to a depth of 7 to 10 inches, consists of a gray or light-gray sandy loam, carrying enough coarse irregular sand and fine gravel to give it a coarse, gritty texture. Below this is a yellow heavier sandy loam, grading at a depth of about 18 inches into the subsoil proper, which is a yellow coarse sandy clay. The type is free from stone, except for a small quantity of quartz fragments and occasional outcrops of the parent rock. The soil is loose and easily tilled, but deficient in humus.

This type occurs principally in the eastern part of the county in an area from one-half mile to 2 miles wide and 6½ miles long, paralleling Clouds Creek. The only other area is found near the center of the county, about 1 mile northwest of Saluda. These areas range from nearly level to moderately rolling and are naturally well drained.

The origin of this type is the same as that of the Cecil coarse sandy loam, namely, from a gray coarse-grained porphyritic granite. In places the differences between the two types seem to be due entirely to different drainage conditions, but more generally they bear a direct relation to differences in the composition of the rock. The Durham coarse sandy loam is derived from a highly siliceous phase of the granite, with a low content of iron. The large rounded granite fragments which outcrop so extensively through the Cecil coarse sandy loam are not found here to any extent.

The Durham coarse sandy loam originally supported a heavy growth of longleaf pine, but practically all of the type is now under cultivation, being devoted principally to cotton and corn. Nearly every farmer plants a few acres of oats for home use and some are growing wheat on a limited scale. Among the minor crops may be mentioned cowpeas, sorghum, and sweet potatoes. The yield of cotton ranges from one-third to one-half bale and of corn from 10 to 15 bushels per acre. The wheat and oat yields are almost invariably light. The soil is rather coarse for the growing of bright tobacco, but very likely it would give satisfactory results with this crop. It also would prove especially adapted to the growing of grapes, berries, watermelons, and a variety of early vegetables.

With liberal applications of coarse manures and commercial fertilizers cotton will produce a bale to the acre. Instead of planting continuously to one crop, as is now often done, a system of rotation should be practiced. A simple and practical rotation, extending over a period of three years, would be to plant cotton the first year, corn the second year, following this with oats in the fall; after the oats are cut in the spring, broadcasting to cowpeas, which will give a good crop of hay. Cowpeas should be planted between the rows of corn and in every other cotton middle at laying-by time. Another plan would be to follow the cotton with a crop of rye in the fall. This could be grazed during the winter and then plowed under in time for corn. Another rotation would be to sow, after corn, vetch and oats together for hay instead of oats alone. The droughty nature of this soil could be largely overcome by keeping it well supplied with humus. Cowpeas and vetch are the best crops for this purpose. They also add a great deal of nitrogen to the soil.

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

Mechanical analyses of Durham coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21050	Soil	11.6	21.9	6.0	24.4	21.6	11.2	3.0
21051	Subsoil	10.6	11.0	23.7	13.3	12.2	25.6	3.6

DURHAM SANDY LOAM.

The soil of the Durham sandy loam, 4 to 6 inches deep, is a gray medium loamy sand or light sandy loam, underlain by material of about the same texture, but of a yellowish color, to a depth of 12 to 18 inches, and then for several feet by a yellowish-brown sandy clay. Local areas are broken by scattering outcrops of the parent rock, but the general run of the type is free from stone, except for a sprinkling of angular quartz fragments over the surface and through the soil mass. The soil is very light colored and rather droughty on account of being deficient in humus.

This type occurs in the southern and eastern portions of the county along the edge of the Piedmont. The largest area extends from about 3 miles north of Batesburg in a southwesterly direction to Moores Creek. A mile farther on is another area, extending west to Clouds Creek. Then to the west of Clouds Creek is an area of several hundred acres and two much smaller ones. The surface features are of a general rolling character, but with scarcely any areas too broken to be farmed successfully. The levelest areas as a rule are found along the crests of the ridges and the most broken in the vicinity of the streams. With the exception of small areas, generally along the lower slopes, which are subject to a slight amount of seepage, the natural drainage of the type is good.

The Durham sandy loam has been formed from the decay and disintegration of a gray medium-grained granite, and possibly in small areas from a massive phase of gneiss with about the same composition. A noticeable feature of the granite is that it contains very little mica, hornblende, or other dark minerals, and where it has not been altered by weathering it makes excellent building stone. The small areas where granite outcrops to any extent are found scattered through the large body of the type near Batesburg.

The original timber growth consisted very largely of longleaf pine, as in case of the Durham coarse sandy loam.

Something over half of the type is under cultivation, being devoted entirely to general farming. The yields generally are light, and vary widely from year to year, depending upon the season. Cotton yields on an average about one-third bale and corn from 10 to 25 bushels per acre. The rotation suggested for the Durham coarse sandy loam will apply equally as well here, and if practiced the average crop yield would be more than doubled. Although not used for the purpose the type would produce a good grade of bright-leaf tobacco. It is also adapted to growing on a commercial scale grapes, early vegetables, watermelons, and a number of other special crops.

The results of mechanical analyses of fine-earth samples of the soil and subsoil of this type are given in the table following.

Mechanical analyses of Durham sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21054	Soil	4.0	15.4	7.8	29.6	17.0	20.4	5.5
21055	Subsoil	3.1	11.1	5.4	20.3	14.5	18.9	26.3

DURHAM FINE SANDY LOAM.

The soil of the Durham fine sandy loam is a gray fine sandy loam, with a depth of 4 or 5 inches. Below this is a yellowish material of about the same texture, extending to a depth of 7 to 10 inches, where it grades through a few inches into a yellow or yellowish-brown very fine sandy clay to silty clay. While sandy the clay is moderately plastic and gets gradually more compact to a depth of about 2½ feet, below which it is uniform for several feet. Small quantities of quartz fragments are found strewn over the surface and mingled with the soil and subsoil. Through careless methods of cultivation the soil in the cultivated areas has become very deficient in humus.

This type ranks next to the Cecil loam in extent. There is a large area in the southern part of the county extending southwest from Clouds Creek. A number of small areas occur farther north scattered here and there through the Cecil loam belt. A typical area occurs about 2½ miles west of Batesburg, and another, which is much larger, is found farther north, between Batesburg and the Saluda River, extending along the county line. The surface features are generally of a gently rolling to rolling character, though there are some small flat areas. The most of the type is fairly well drained, and in fact damage is being done by erosion in many places.

The Durham fine sandy loam is derived from a very siliceous phase of a light-colored talcose schist or similar rocks. The weathering has progressed well, with marked evenness, and only locally does any of the rock appear within 3 feet of the surface. Numerous quartz veins through the schist are responsible for the fragments of this material now found on the surface and in the soil.

The areas under cultivation are devoted mainly to cotton and corn, though in a more limited way to other crops, including oats, wheat, sorghum, and cowpeas. Cotton yields from one-third to three-fourths bale and corn from 10 to 25 bushels per acre. Oats and wheat give light yields. Sorghum does well, and when planted broadcast with cowpeas gives heavy yields of excellent forage. Cowpeas planted after oats or wheat will produce a ton or more of hay per acre. More attention should be given to the growing of cowpeas and vetch, which not only improve the soil but give good yields of hay. It is probable that the best areas would produce a good grade of bright-leaf tobacco.

Japan clover, especially in the lower lying areas, where given a chance affords good pasturage. There are extensive tracts from which the merchantable timber has been removed, and on these but little remains except a scrubby growth of oak.

The main problems in handling this type are to keep it well supplied with humus and to check erosion. These can be secured by practicing a rotation of crops, in which cowpeas and other legumes are included, and by deep plowing and properly terracing where needed. With good management this soil can be made to produce much larger yields than are now obtained.

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

Mechanical analyses of Durham fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
21052, 21056.....	Soil.....	0.9	3.6	2.9	17.8	35.2	31.7	7.7
21053, 21057.....	Subsoil.....	.4	1.3	1.8	8.7	18.9	47.7	21.1

MEADOW.

The term "Meadow," applied to all of the alluvial lands of the county, covers a grouping based upon conditions of poor drainage rather than upon similarity of texture. The Little Saluda River and its tributaries have overflow strips ranging from a few yards to one-eighth of a mile wide. The soil varies locally as well as in a more general way with the character of the uplands through which the streams flow. Where the uplands are sandy the bottoms range from a sand to a sandy loam, while through the extensive loam and fine sandy loam belts they are either a dark-gray fine loam or sandy loam to silt loam. These areas never have been farmed to any great extent, and the small areas now under cultivation give very uncertain yields on account of overflows, which occur with every heavy rain. The wettest areas are those through the open sandy uplands, where the streams have been badly clogged by sandy material washed from the adjacent slopes. By keeping the streams cleared of brush and other obstructions, and terracing the slopes so as to prevent wash, the wettest of these areas would become dry enough to afford good pasturage. Areas intended for cultivated crops should have ditches at the base of the slopes to cut off seepage and overflows from the hillside gullies.

Along the Saluda River are areas ranging from strips too narrow to be shown on the soil map to nearly a mile wide, as at Old Town Ferry. These vary in texture from a brownish-gray loose sand immediately along the banks of the stream to a dark-brown sandy loam or loam next to the slopes. For a long time after the settlement

of the region these lands were highly prized and produced heavy grain and hay crops, but with the increasing frequency and destructiveness of overflows during recent years, about all of them have been thrown out of cultivation. Some of the smaller areas have been abandoned entirely, while others are fenced and used for pastures. A part of the large area at Old Town Ferry is used for growing hay, of which heavy yields are secured during dry seasons.

SUMMARY.

Saluda County, with an area of 283,520 acres, or 443 square miles, is situated in the west-central portion of South Carolina. It is all in the Piedmont Plateau, except a narrow strip along the southern edge which is in the Coastal Plain, the surface features ranging from quite rolling in the former to level in the latter. Most of the drainage is into the Saluda River which forms the northern boundary. The general elevation ranges from 300 to about 550 feet above sea level.

Saluda is one of the newer counties of the State, having been formed from a part of Edgefield County in 1895. At the same time the town of Saluda was founded near the center and made the county seat. The population of the county, consisting very largely of the descendants of the early settlers, is about equally divided between the white and the negro races.

The interests of the county are almost purely agricultural. Cotton and corn are the main crops. Less attention is given to the growing of oats, wheat, and cowpeas. The growing of peaches and vegetables on the Coastal Plain soils while not extensive has proved very profitable.

The climate is mild and adapted to a much greater variety of crops than are now grown. Vast tracts are still timbered.

Not much attention is given to the rotation of crops or to terracing to prevent erosion, but a growing interest is being manifested along these lines.

The two main physical divisions of the county give rise to distinct groups of soils. Four types were recognized in the Coastal Plain and eight types in the Piedmont Plateau. Their range in texture is from sands and coarse sandy loams to clay.

The Norfolk sandy loam is a light sandy soil, especially adapted to the growing of early truck and bright-leaf tobacco. Peaches also do well. The yields of cotton and corn vary from light to good, depending upon the amount of fertilizer and cultural methods used.

The Norfolk sand is a loose droughty soil of little importance. Cotton and corn give light yields. Areas with clay within 4 feet of the surface will grow good peaches, but the trees are rather short lived.

The Orangeburg sandy loam is the most desirable type in the county for general farming purposes, and has proved an excellent peach soil.

The Portsmouth loam is of very limited extent and of little importance. If drained it would produce good crops of corn, oats, cabbage, onions, celery, etc.

The Cecil sandy loam ranks next to the Orangeburg sandy loam in desirability. It is well adapted to all of the general crops of the region, as well as to many others not now grown. Stock raising and dairying are industries that should be developed. The roughest areas should be planted to Bermuda grass and used for pasture.

The Cecil coarse sandy loam is characterized by frequent outcrops of granite. It is used principally for cotton and corn, which give fair yields if properly cared for. Wheat and oats are grown to some extent and generally give light yields. The rougher, more stony areas, which can not be cultivated satisfactorily, would make good pasture lands if sown to Bermuda grass.

The Cecil loam is the most extensive type in the county. It is used for cotton, corn, oats, and wheat and in a limited way for cowpeas, sorghum, and a few other crops, all of which give light to moderate yields. It is a good grass and clover soil, well suited to the raising of stock and to dairying. The rougher areas if cleared should be sown to grass and pastured. If timbered they should be allowed to remain so.

The Cecil clay occurs in two phases and is mostly an erosion type found through the Cecil loam and the Cecil sandy loam. Cotton and corn are the principal crops. The type is best adapted to cotton, clover, and grasses. Good wheat can be grown on the best areas. A large proportion of the type, subject to severe erosion, should be put in Bermuda grass and used for grazing lands.

The Durham coarse sandy loam and the Durham sandy loam are light siliceous soils giving rather light yields of the general crops. They are best adapted to grapes, berries, vegetables, and possibly to bright tobacco. These soils need to be better supplied with humus.

The Durham fine sandy loam is used principally for cotton and corn, which give light to fairly good yields. Wheat and oats are grown to some extent and give light yields. The lack of humus in the soil is the main cause of its low state of productiveness.

Meadow comprises all of the alluvial lands along the streams. On account of frequent and destructive overflows these lands are not farmed to any extent. The river lands, especially, were once highly prized for grain and hay crops, which gave heavy yields. The small waterlogged areas could be made into good pasture land by keeping the streams cleared of brush and other obstructions and terracing the slopes to prevent erosion.

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