Issued June 15, 1912.

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 RANDOLPH COUNTY, ALABAMA.

By R. T. AVON BURKE, of the U. S. Department of Agriculture, and A. C. McGEHEE 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.
1912.

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SOIL SURVEY.

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J. W. MCKERICHER, *Secretary of Committee.*

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., December 15, 1911.

SIR: In the extension of the soil survey work in the State of Alabama work was undertaken in Randolph County during the field season of 1911. This work was done in cooperation with the Alabama department of agriculture and industries, R. F. Kolb, commissioner. The selection of the area was made after conference with the State officials, and was indorsed by the Hon. J. T. Heflin, within whose congressional district the county lies.

I have the honor to transmit herewith the manuscript report and map covering this work, and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1911, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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MAP.

SOIL SURVEY OF RANDOLPH COUNTY, ALABAMA.

By R. T. AVON BURKE, of the U. S. Department of Agriculture, and A. C. McGEHEE and W. E. WILKINSON, of the Alabama Department of Agriculture and Industries.

DESCRIPTION OF THE AREA.

Randolph County, Alabama, is situated in the east-central part of the State. On the north it is bounded by Cleburne, on the east by Carroll, Heard, and Troup Counties, Georgia, on the south by Chambers and Tallapoosa Counties, and on the west by Clay County.

In outline the county is quite regular, with the exception of the northeast corner, where the Little Tallapoosa River forms the boundary. It is rectangular in shape, with the exception of the eastern boundary, which diverges westward from a north-and-south line, making the distance across the county along the southern boundary $24\frac{1}{8}$ miles, whereas along the north boundary it is $19\frac{1}{4}$ miles. The north and south dimension is about 26 miles and the included area 583 square miles, or 372,120 acres.

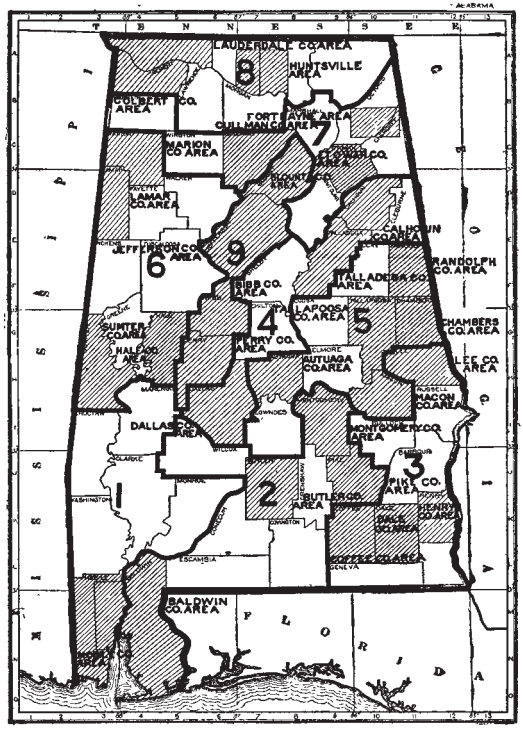

FIG. 1.—Sketch map showing location of areas surveyed in Alabama.

The county is well watered by rivers and creeks and their tributaries, and lies within the Tallapoosa and Chattahoochee drainage system. The former receives the greater part of the drainage. The Tallapoosa and the Little Tallapoosa Rivers unite just north of Burrow Ferry. The course of the Little Tallapoosa River is very winding. Many creeks, streams, and branches are tributary to it, draining the central, north,

and northeast parts of the county, the most important being Knokes, Cutnose, Cohobadiah, Cane, Bear, Wolf, and Piny Creeks.

The Tallapoosa rises in Cleburne County and flows south through the area within a few miles of the western boundary. The course of this river is not so tortuous as the Little Tallapoosa, but it is quite indirect. It drains the western and southwestern part of the county directly by way of Kitchabadoggo, Lost, Little Piny Woods, Sand, Mad Indian, Fox, Crooked, Cornhouse, Wild Cat, Hurricane, Cedar, and Hutton Creeks, and numerous small branches. The Tallapoosa also receives the waters of High Pine Creek, which empties into the river in Chambers County. High Pine is one of the most important streams of Randolph County, draining the south-central part. The surplus waters of the eastern and southeastern portions of the area drain into the Chattahoochee system by way of Wehadkee Creek and its tributaries, Little Wehadkee and Guss Creeks. The Wehadkee flows south and east, joining the Chattahoochee River in Troup County, Georgia. A few branches belonging to this same system head in Randolph County north and south of Omaha.

The divide between the two watersheds varies in elevation from 750 feet to 1,550 feet above sea level. Its width is quite variable. The streams have headed back so far in places as to make it quite narrow, while in other places it attains a width of 2 to 3 miles, extending from Black Jack Mountain south and southwestward, leaving Omaha to the east and including Potash, Pittman, and Roanoke.

Physiographically Randolph County is included within what is known as the Piedmont Plateau, which extends from central Alabama to New Jersey. This at one time was a high mountain range bordering the Atlantic Ocean, and was reduced to its present appearance by ages of weathering and erosion. It is now flanked on the east by the Atlantic Coastal Plain and on the west by the Appalachian Mountains. The inequality of the surface features is due to erosion and depends upon different degrees of resistance offered by the various rocks to the various agencies of decomposition and disintegration.

The watercourses in general have considerable fall and are actively engaged in deepening their channels, and as a result the rivers have developed but narrow bottoms, not continuous, but cut off in places as the river swings toward the bluffs on one side or the other. The bottoms are developed to a greater extent along some of the larger streams.

A glance again at the variation noted in the elevation of the divide will give some idea of its general range, the lowest elevation being in the southern part and the highest in the northern part of the county. The surface features east and south of the divide are not

so rough as the area north of it, but are more rugged as the divide is approached. In the vicinity of Roanoke, and particularly east, south, and southeast, the county is characterized by low, rolling ridges. The approaches to the watercourses, although frequently steep, are not abrupt. The same topography occurs in the vicinity of Wadley and westward. North and west of the divide the country consists of rolling and roughly rolling ridges or hilly to mountainous country.

A number of structural plains have been developed throughout this area, particularly in the vicinity of Omaha; also around Peace, Napoleon, in the neighborhood of Tenant, and north of West.

Public roads extend to all parts of the area. They were not laid out under any definite system, but an effort has been made to avoid grades as much as possible. Proportionately more roads occur in the southern and eastern parts of the county, where the surface features are less rugged and where the country is more thickly settled, while the roads encountered in the western and northwestern parts of the area are comparatively few in number. The roads in general, so long as the weather is dry, are fairly good, but in the winter and early spring, when there is a great deal of rain, hauling is difficult. Road material is plentiful throughout the county, and good, permanent highways could be economically built and maintained.

A comprehensive system of local and long-distance telephone lines has been established throughout the county. These have been developed by the farmers themselves and have added much to the life on the farm. The rural free delivery of mail reaches nearly all the homes in the county.

The population of Randolph County, according to the census of 1910, is 24,659. It is almost entirely native born, very few foreigners having come in since the early settlement. Roanoke, Malone, Wedowee, Wadley, Graham, and Rock Mills are important towns.

Churches and schoolhouses are conveniently located throughout the county; a first-class high school, in connection with a normal institute, is located at Roanoke, and one also at Wedowee. Gins and gristmills are very numerous throughout the area, and a first-class flour mill is situated on the Little Tallapoosa River a few miles from Graham. Rock Mills and Roanoke each have a cotton mill, the latter town possessing also a good fertilizer plant.

Railroad facilities for the county are far from satisfactory. A spur of the Central of Georgia extends from Opelika and terminates at Roanoke. The Atlanta, Birmingham & Atlantic enters the county below Cragford, following Crooked Creek to the Tallapoosa, passing through the towns of Malone and Wadley, and continuing beyond the Chambers County line. It enters Randolph County again just west of where High Pine Creek leaves the county, continuing to Roanoke and into Chambers County, a few miles west of the southeast corner.

Wedowee, the county seat, is 15 miles from the Atlanta, Birmingham & Atlantic and the Central of Georgia at Roanoke and 10 miles from the former at Malone. A branch of the Central of Georgia extends to Bowdon, Ga., just a few miles from the northeast corner of the county, while the nearest railroad point on the Southern Railway is Heflin, about 12 miles north of the county line in Cleburne County. Lineville, in Clay County, is the point on the Atlanta, Birmingham & Atlantic nearest to the northwestern part of the area.

The local markets of the county are the towns mentioned and the more remote Birmingham and Atlanta, distant from Roanoke 143 and 55 miles, respectively.

CLIMATE.

The climate of Randolph County is temperate. The winters are generally mild. Recurrent cold snaps are frequent, but of rather brief duration, and the temperature rarely falls below zero. The most disagreeable feature of the winter is the frequent occurrence of prolonged misty rains, which are usually accompanied by east or southeast winds and may be followed or preceded by light flurries of snow. It will be noted in the table given below that there is little difference in the monthly mean temperature of the winter months, although there is a range from 10° below zero to 75° F. at Anniston, the lowest temperature being recorded for February and the highest for December and February.

The summers are usually agreeable, although there are days that are hot and oppressive. The nights are always cool, being tempered by a breeze from the Gulf of Mexico, which reaches this area from the southwest. The average monthly mean temperature for the summer is 77° F. and the lowest absolute minimum 44° F. during the month of June. The absolute maximum so far recorded is 103° F., occurring in August.

The precipitation in Randolph County is ample for the growth of crops and is well distributed throughout the year. The annual mean at Anniston is given as 49.1 inches, while 38.5 inches is given for the driest year and 56.1 inches for the wettest year.

Randolph County has exceptionally good water. Springs are quite numerous and water can be secured in wells at depths ranging from 20 to 75 feet.

The average date of first killing frost in autumn is given at Anniston as October 20 and the last in spring as April 2, while the earliest killing frost recorded in autumn was October 6 and the latest in spring on April 20. The average growing season is thus of 201 days duration, which is ample for the production of all the important crops.

With an altitude that ranges from 550 to 1,550 feet above sea level, local differences in the climate may be expected, but, except in the occurrence of frost, none was apparent. The relative immunity of peaches and cotton on the uplands to the influence of frost in autumn and late in spring as compared with the same crops in the lowlands and valleys is a climatic feature recognized here as elsewhere, and the part it plays in general agriculture is quite important. The susceptibility of cotton in the lowlands is more or less modified by the physical nature of the soil in which the crop is planted. Field observations show that this crop succumbs first on the more sandy soils, whereas it is more resistant on clay and clay loam soils, as there is relatively less replanting on the heavier soils than on those of lighter texture.

The data given in the following table are taken from records kept at Anniston, Calhoun County, no Weather Bureau station being located in Randolph. The statements represent local conditions fairly well.

Normal monthly, seasonal, and annual temperature and precipitation at Anniston.

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	44	75	7	3.7	4.7	2.3	0.6
January	44	73	7	5.2	4.1	7.1	0.4
February	44	75	−10	4.9	3.8	2.1	1.7
Winter	44	.....	.....	13.8	12.6	11.5	2.7
March	55	84	12	5.4	3.5	6.9	0.3
April	61	88	27	4.6	2.6	3.8	0.0
May	69	94	36	4.0	2.7	10.6	0.0
Spring	62	.....	.....	14.0	8.8	21.3	0.3
June	76	100	44	4.0	4.1	7.6	0.0
July	78	102	56	5.3	4.2	4.1	0.0
August	78	103	56	3.9	1.0	5.1	0.0
Summer	77	.....	.....	13.2	9.3	16.8	0.0
September	73	98	36	2.4	2.5	2.3	0.0
October	63	92	30	3.0	1.5	2.7	0.0
November	51	82	16	2.7	3.8	1.5	0.0
Fall	62	.....	.....	8.1	7.8	6.5	0.0
Year	62	103	−10	49.1	38.5	56.1	3.0

Average date of first killing frost in autumn, October 20; of last in spring, April 2. Date of earliest killing frost in autumn, October 6; of latest in spring, April 20.

AGRICULTURE.

Randolph County was organized in the year 1832 and named after John Randolph, a noted Virginia statesman. Wedowee (then McDonough), Roanoke, and Louina were the chief trading points at that time. Most of the county was covered with a heavy growth of pine and a more scattering growth of oak, hickory, gum, and walnut. A part of the area was occupied by the Creek Indians, but they were removed in 1836 and 1837. Most of the land was acquired by the early pioneers by Government entry, and the Indian lands at public auction.

Nearly all the old-established families came from Fayette County, Ga., the southern third of the county being settled by slave owners who had acquired large tracts of land. Up to a short time before the war this area was a great cattle country, stock thriving on the luxuriant spring and summer growth of grass and subsisting largely on cane through the winter.

Columbus, Ga., at the head of navigation on the Chattahoochee River, and Wetumpka, on the Coosa River, were the early markets, but with the building of the railroad from Atlanta to Montgomery, West Point, Ga., became the chief market.

Cotton had attained considerable importance in this county before the war and has become the dominant crop since. The early practice was to produce the crop year after year on the same fields, and when the yields declined to take in more new ground, abandoning the old fields to weeds and brush. Some idea of the agriculture during this period can be obtained from data collected by the Census Bureau for the years 1879, 1889, and 1899. The land planted to cotton increased from 23,177 acres in 1879 to 28,387 acres in 1889 and to 43,871 acres in 1899. The production in 1879 was 7,475 bales and for 1899, 17,148, and assuming that the seasons were comparable, a very decided increase in rate of yield took place within this period. The expenditure for fertilizers for the years 1879 and 1889 was $48,299 and $48,271, respectively. In 1899 the amount expended for this purpose was $78,470.

The production of corn has also increased in the 20 years under consideration, the acreage rising from 29,595 in 1879 to 41,758 in 1899. The rate of yield, however, shows less change than in case of cotton. It was 11.2 bushels in 1879 and only 12.1 bushels in 1899, though seasonal factors may have made greater difference with corn than with cotton. The acreage in oats was 4,850 in 1879, and continued at approximately this figure until 1899. Wheat attained its maximum acreage in 1879, when 10,156 acres were in this crop. The acreage fell to 2,697 in 1889, but increased to 7,365 in 1899. The acreage in rye and barley has always been small. Irish potatoes are grown

largely in home gardens for local consumption. Sweet potatoes have always been one of the more important of the minor crops, between 400 and 600 acres being given to their production. Sorghum and ribbon cane are grown in occasional patches.

The authority quoted gives the number of acres of improved farm land for the year 1899 as 303,472, as against 300,105 in 1889 and 278,602 in 1879. Fully 60 per cent of this land is used for pasture or is lying fallow, as the aggregate acreage of cultivated crops in 1899 was only 110,106. The same authority gives the average size of farms in 1879 as 123 acres; 136 acres in 1889; and 84.7 acres in 1899. This might at first be considered a change to much better farming, but when the percentage of farms operated by the owners is noted a different conclusion may be drawn. In 1879 this percentage was 68.3, in 1889 it was 72.9, and in 1899 it was only 44.3. Thus it will be seen that in 1899, 55.7 per cent of all the farms were operated by tenants and their holdings were classified as separate farms.

The system of land tenure differs in various parts of the county. The most common method is to lease the land for a share of the crops. On this basis the tenant turns over one-third of the cotton and one-fourth of the corn to the landlord, and supplies the labor, work stock, tools, etc. Where the landlord supplies work stock and tools, the tenant keeps one-half the produce. Very little land is rented for cash, but a good deal of it is rented for what is known as standing rent, which is about two bales of cotton for each 30 acres of land. The tenants, as a rule, are dependent upon the landlord or local merchant for subsistence during the growing of the crops. The obligations are usually paid each fall from the surplus crop after the landlord's claims have been settled.

In some sections of the county labor is quite plentiful, while in others great difficulty is experienced in securing reliable and moderately efficient help. Labor when employed by the month receives from $15 to $20 with board or $25 without, while day laborers receive from 75 cents to $1.50.

Cotton is the most important crop of the area, and it is believed that the acreage has increased considerably since the year 1899. In general, methods employed in the production of this staple have not changed materially in recent years. Most of the land is prepared in the spring by bedding on the water furrow of the previous year. This bed is opened and fertilizer dropped by hand through long tin funnels, which are dragged along the rows, or is less commonly put in with fertilizer distributers and the seed dropped and covered by cotton planters. The crop usually receives two hoeings. The cultivation is usually done with scrapes and sweeps and is generally shallow and frequent. At the last cultivation the beds are left as slight ridges. In the less rugged country some of the land is prepared in

the fall. It is broken flat with a 1 or 2 horse turnplow, or more rarely with a disk plow, and bedded the following spring.

The acreage of corn has increased with that of cotton, and although the average yield per acre is not much more than 12 bushels, individual yields runs as high as 100 bushels to the acre. Considerable corn is imported into the county each year, and the need of producing a larger crop is becoming more apparent to the farmers and effort is being made to meet this home demand. Most of the corn land is prepared in the spring, and where corn is alternated with cotton the land is prepared the same as for the latter crop and corn planted in every other furrow. Very little corn is now planted on top of the beds, except in the lowlands or bottoms, where the moisture is apt to be excessive and there is danger of the crop being scalded. The practice of breaking the land flat in the fall and bedding in the spring is quite common in the southern part of the area, and the returns more than justify the additional labor involved. Corn is cultivated throughout the county with 1-horse turnplows, scrapes, and sweeps, and in the last cultivation the ground is left flat.

The production of oats has increased considerably in the last decade and now constitutes an important crop of the county. Both fall and spring oats are sown, but the greater proportion is sown in early spring. It is generally conceded that fall oats are more thrifty, make better growth, and give much heavier yields. The common varieties sown are the Rust Proof, Appler, Burt, and Bancroft. The greater part of the oat crop is cut green for hay, a practice that can be commended, particularly when used as a cover crop during the winter. Sowing is usually broadcast by hand, the oats being plowed in with a 1-horse turnplow. A growing practice is to break land flat and put oats in with a fertilizer distributer. A few acres are planted each year with the ordinary grain drill.

Wheat has been a relatively important crop in this county, but the acreage is rapidly decreasing and many failures are reported, although good stands were encountered where the productiveness of the soils had been improved by good methods. Practically all of the wheat grown is sown in the fall. The land is prepared and seeded similarly to that used for oats. The varieties planted are the Purple Stem and Bearded. The former is preferred, as it is not so troublesome to handle. Very few binders are used in this county, as much of the land is too rough for their use. Most of the wheat and oats grown for grain is harvested with the cradle and bound by hand. Small thrashing outfits, which go from farm to farm, are found in almost every section. The price paid for thrashing is usually 6 or 7 cents for wheat and from 2 to 5 cents for oats. The acreage of oats and wheat should be materially increased and these crops be given an important place in cropping systems.

Sorghum, cowpeas, sweet potatoes, peanuts, sugar cane, rye, Irish potatoes, and barley are minor crops of more or less present importance. Sorghum is grown largely for forage and to a much less extent for sirup. The acreage has decreased somewhat in the last decade. Fifteen years ago cowpeas were only an experimental crop, but 464 acres were planted in 1900. They are grown occasionally for seed, but mainly for summer forage and for their fertilizing value. The other crops mentioned are grown largely for home consumption or are of experimental value only, though destined to have an important place in the agriculture of the future.

The practice of rotating crops systematically is not a general feature of the agriculture of this section, but much more interest is being taken in it now than formerly. It is not uncommon for corn or cotton to be grown in the same fields 4 or 5 years in succession, while some farmers have reported the continuous production of cotton for 15 years. The bottoms along the river and streams are favored places for the continuous production of corn, while proportionately more cotton is grown on the uplands. The growing practice of alternating corn with cotton and planting cowpeas in the corn in the last cultivation is an important step in the direction of a better cropping system, but the intervals between the staple cultivated crops are not sufficient.

Another system, not so generally employed, is to follow the corn with fall-sown oats and the succeeding summer to put in sorghum or a mixture of cowpeas and sorghum. The land is then broken flat and put in cotton the following spring.

Some of the land has been under continuous cultivation for periods ranging from 40 to 60 years, while other areas are not so old, but all have been subjected to most improvident methods, with the result that the soils are generally producing only minimum yields. The great problem that now confronts the farmer of this section is that of building up or improving the productive capacity of the soils so as to lessen the proportional cost of labor, to reduce expenditures for fertilizer, and to be in a better position to meet the advance of the boll weevil, which there is every reason to believe will reach the county before many years. To do this, the land must be more thoroughly prepared, a sufficient supply of organic matter maintained, and the crops systematically rotated, so as to keep the land occupied winter and summer, producing crops of value for food or fertilizer, and protecting the land from surface washing and erosion by the heavy rains in winter and spring.

A few farmers throughout the county are practicing deeper plowing, but in general the plowing is very shallow, being rarely over 4 inches for corn or cotton. A deep and well-prepared seed bed is one of the essentials for the maximum production of crops. A shallow

seed bed is often too wet under heavy rainfall and too dry in periods of drought. Care should be exercised in deepening the soil, and the required depth of 10 or 12 inches should be attained gradually where the turn plow is used and not over 1 inch of subsoil exposed each year. Where the disk plow is used it can be so regulated that the depth desired can be attained at once and no subsoil brought to the surface. The unweathered subsoil where exposed in large quantities decreases for a time the productiveness of the soil. In this area this is particularly true of the Durham series and not so apparent in the Cecil and Louisa series, with their red subsoils. A deep, well-drained soil has a greater capacity for holding water, which is materially increased where there is a plentiful supply of partially decomposed organic matter.

The advantage of a good water supply may be the difference between success and failure in seasons of protracted drought. Deep plowing also lessens to a remarkable degree the damage done the soil by surface washing or erosion. When the land is properly prepared and has a fair content of organic matter, side-hill ditches and terraces in most places can be dispensed with. This beneficial feature of deep plowing has already been demonstrated by a few farmers in the more rugged part of the county. A deep seed bed also allows the heat and air to penetrate the soil to greater depths, thus stimulating chemical and bacterial activity and so contributing to vigorous plant growth.

The necessity of deep plowing is not so apparent on the deep sandy soils as on the more shallow types. The former can be more rapidly improved by the incorporation of organic matter, but on the latter this practice is of primary importance. The soils of this area are deficient in humus, which can best be supplied by the use of stable manure and the turning under of grass sod, grain stubble, or green manures. The supply of organic matter can be developed and maintained under any system of soil management which includes the frequent use of winter cover crops and summer forage. The most desirable winter cover crops are rye, oats, barley, winter vetch, and crimson clover, which not only give additional grazing but protect the soil from washing, utilize plant food that would be largely lost, add humus to the soil, and put the land in good physical condition. Where vetch or clover is used it not only increases the feeding value of the pasturage but adds largely to the nitrogen content of the soil through the assimilation of free nitrogen from the air by nitrifying organisms. To get a good stand of these leguminous crops it may be necessary to inoculate the soil. This will probably be more necessary for the clover than the vetch, as spring varieties of the latter legume are indigenous to many parts of the county. The use of vetch and oats, or vetch and rye, makes very desirable grazing or abundant forage in early summer.

The common summer forage of this county is sorghum for hay or roughage, at times combined with cowpeas. Where heavy yields are desired the orange sorghum and the running variety of cowpeas are used. The peanut, soy bean, and velvet bean are also desirable additions to the summer forage crops, as they not only enrich the soil but replace in a measure the more concentrated feeds in stock rations. Broom sedge, which occurs throughout the thinly wooded sections of the county, is the chief reliance for early spring pastures, while patches of Bermuda grass are used for summer grazing.

Commercial fertilizers are commonly used throughout the county, consisting usually of a mixture containing 10 per cent of phosphoric acid, 2 per cent of nitrogen, and 2 per cent of potash. This is applied to cotton at the rate of 200 to 400 pounds to the acre, and usually put in the cotton beds just before planting. There is less of this mixture used for corn, although many farmers use it each year. It may all be put in at once before planting, but the practice of intercultural fertilization is becoming more and more common each year.

Where it can be secured, barnyard manure is said to give as good, if not better, results than commercial fertilizers, but the quantity made is rarely sufficient for the needs of the farm. Where used it is dropped by hand in the drill and thus made to cover the maximum area.

The productivity of the various soils of the county can be developed and maintained by more thorough preparation, the use of winter cover crops, and the more frequent inclusion of leguminous crops in rotation systems.

Randolph County offers unusually good opportunities for the profitable development of the truck, dairy, and stock-raising industries. Lands are cheap, good water is everywhere obtainable, and the climate is favorable to agricultural pursuits.

SOILS.

Randolph County lies in the southern part of the Piedmont Plateau, a physiographic division which at one time was a high mountain range, and which has since been reduced first to a peneplain and then to an eroded plateau by ages of weathering and erosion. The underlying rocks, from which the various soils are derived, are classified geologically as igneous and metamorphic. These rocks are the oldest known to geologists. The prevailing rocks of the area are mica and hornblende schists, gneiss, and granite. The mica schists grade through gneiss to granite on the one side and to arenaceous or siliceous schists on the other. Interstratified with all the rocks occur occasional narrow bands of hornblendic schists and sometimes chloride schists. Numerous quartz veins cut through the

other rock formations, and from these are derived the quartz fragments so abundant in the soils of the county. The rock formations usually follow a northeast and southwest strike and are much folded and contorted.

The upland soils are derived directly from the disintegration and decay in place of the various rocks. They include a range in texture sufficient for the development of a wide and varied agriculture. Sixteen distinct soil types were mapped, not including Meadow and Rock outcrop. This classification was based on differences in color, origin, and texture (the relative content of sand, silt, and clay), and on drainage conditions, those types of similar origin and general physical characteristics being grouped into series.

The alluvial soils of stream bottoms represent material washed from the uplands and deposited by overflow stream water. The bottom lands are largely composed of Congaree soils—the Congaree fine sandy loam and the Congaree loam. The residual or upland soils comprise six series. From the mica schists—rocks which have the greatest distribution in Randolph County—are derived the Louisa and York series. The York series is represented only by the fine sandy loam, which is distinguished from the Louisa type by its yellow subsoil. It is not an important type, on account of its limited distribution. The Louisa series is represented by the clay loam, fine sandy loam, slate loam, and loam. In the southern part of the area, where the schists are brightly colored with yellow and red and are highly micaceous, drainage is excessive and the soil covering shallow, on which account shallow phases of the Louisa clay loam and Louisa fine sandy loam have been distinguished on the map. Toward the north the soils become deeper and outcrops of the parent schists are less frequent. The mica flakes become finer and in places are weathered completely to a depth of a foot or two.

To the north of the Little Tallapoosa River the mica again becomes prominent and occurs in much larger flakes. North and west of Newell the mica schists are much more massive and darker in color, while garnets are quite conspicuous all through the rock and in the derivative soil. South of Cedar Creek and west of Almond the soil is derived from interbedded granite and schists.

Gneiss and granite also contribute to the soils of the county, although the latter has a very limited occurrence. The gneiss usually occurs in rolling situations, while the granite occupies the lower levels and frequently outcrops on the surface in the form of flat rocks, as near Rock Mills, Almond, and west of Blake Ferry. The gneiss usually weathers deeply, while the granites generally give a shallower soil. These rocks give rise to the Cecil and Durham series. The Cecil series is represented here by the sandy loam, fine sandy loam, stony sandy loam, stony loam, and clay loam, which are char-

acterized by thin red subsoils, less micaceous than those of the Louisa series. The Durham series, including the sandy loam and fine sandy loam, is characterized by its yellow subsoils.

The hornblende schists usually occur along the valley slopes, being rarely found in the uplands. These rocks give rise to a phase of the Cecil clay loam and to the Iredell loam. Some green chlorite schists are associated with the hornblende schists.

The following table gives the names and areas of the several types shown on the accompanying map:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Louisa slate loam	95,488	25.6	Durham sandy loam	4,928	1.3
Louisa fine sandy loam	67,008	19.6	Meadow	2,496	.7
Shallow phase	6,080		Durham fine sandy loam	1,856	.5
Louisa clay loam	31,296	15.1	Cecil stony loam	1,216	.3
Shallow phase	24,896		Wehadkee loam	704	.2
Louisa loam	44,096	11.8	York fine sandy loam	512	.1
Cecil sandy loam	25,984	7.0	Iredell loam	448	.1
Congaree loam	21,184	5.7	Rock outcrop	256	.1
Cecil clay loam	11,200	5.5	Cecil stony sandy loam	192	.1
Heavy phase	9,472				
Congaree fine sandy loam	15,872	4.2	Total	373,120	.....
Cecil fine sandy loam	7,936	2.1			

LOUISA FINE SANDY LOAM.

The Louisa fine sandy loam consists of a gray fine sandy loam, 3 to 10 inches deep, which passes rather abruptly into a light-red brittle clay subsoil, usually extending to a depth of 2 to 3 feet. Where the surface covering is deep the color usually changes from gray to yellowish as depth increases, and where shallow the red is more conspicuous. Mica is more abundant in the subsoil when it is shallow and less so when developed to a depth of 3 feet or more. It does not have the peculiar greasy feel so characteristic of the type under normal conditions. Throughout the type quartz fragments are usually present in varying quantities, scattered over the surface, and quartz seams not uncommonly cut through the soil section. These fragments are more abundant about the heads of drainage ways and on the slopes. Such areas as were included with the type were not extensive enough to map on the scale used.

Another phase of local occurrence is slightly heavier in texture and is usually found in depressions or in the more level spots on the uplands. It runs to a heavy fine sandy loam in texture.

The Louisa fine sandy loam is derived from the decay in place of the underlying mica schists. These rocks weather comparatively

slowly and occupy the highest ridges and more rolling country. They are variously colored, ranging from light-gray to dark-brown or reddish, and the beds are often twisted and bent. Mica is usually conspicuous. The quartz fragments present are derived from the quartz veins that cut through this schistose rock.

This type has the greatest extent of any soil in the county. A large area occupies the upland south of Jones Creek and extends to the county line beyond Waldrep, the northern part including Omaha. The mica in this area, though deeply weathered, is in larger flakes and a prominent constituent of the subsoil. The southern portion of this particular area, on the ridge east of High Shoals and extending to the county line three-fourths of a mile north of Mason, Ga, and also east of Omaha, is not quite typical, as the topography is much more rugged. The mica schist is interbedded with gneiss and to a less extent with quartzite, although the first-named rock predominates. Quartz and quartzite fragments are scattered over the surface, but not to an extent sufficient to show on the map, and occasionally, when the stream slopes are very steep, ledges of quartzite are exposed. The soil of this phase will range from very fine sandy loam to fine sandy loam. There is proportionately less of it under cultivation, and it has a greater organic content than the typical soil, but is not so desirable, on account of the more rugged surface features. It is said to be slightly more productive.

The Louisa fine sandy loam is typically developed on the tops of the ridges south and southeast of Wedowee. On the ridge in the vicinity of Tenant the soil and subsoil are quite deep, but mica flakes are not so conspicuous, appearing to have weathered more completely, so that the characteristic greasy feel of the clay subsoil is less in evidence, although as the underlying parent rock is approached the micaceous feature becomes more and more pronounced. This greasy, micaceous feel is characteristic of the subsoil of the type as extensively developed in the vicinity of Napoleon, including the hamlets of Peace, Corbin, and West. The mica is more conspicuous in the vicinity of Lamar and to the south.

About 1 mile from Rice Mill and southeast of Copper Mine Knob there is developed a belt of another phase, in which the soil is quite sandy, mica flakes being more noticeable, and quartz and schist fragments more abundant over the surface than is common in the more typical soil. This phase is derived from a garnetiferous siliceous schist. Seams of kaolin are quite common all through this phase. Along the southern edge of this belt the schist is interbedded with pegmatite and quartzite. The topography of this phase in general is more rugged and broken than of the more typical areas. Comparatively little of it is under cultivation.

Cotton, corn, oats, wheat, cowpeas, sorghum, and garden truck are grown on the Louisa fine sandy loam. The yields of cotton reported range from one-sixth to one-half bale with fertilizer. The fertilizer commonly used analyzes about 10 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash. The quantity used to the acre varies from 150 to 400 pounds, 200 pounds being an average application. Yields of 1 bale to the acre, however, have been secured by the use of stable manure.

Corn ordinarily yields from 8 to 15 bushels per acre without fertilization, and from 15 to 40 bushels when fertilized, depending on the quantity used, cultural methods, season, etc. Average applications vary from 150 to 200 pounds, generally supplemented with stable manure, or when this is not available cottonseed meal is occasionally used. The yield of oats ranges from 20 to 40 bushels to the acre. The production of wheat is quite limited on this type, yields being in the neighborhood of 10 to 20 bushels, unless the soil has had a good top dressing of manure. Most of the sorghum grown on this type is used for hay and is sometimes grazed by live stock. Patches of sorghum are used for home-made sirup, the estimated yields ranging from 150 to 250 gallons to the acre. Occasionally sorghum and cowpeas are grown together for hay, and although no definite yields were reported, the mixture is said to produce heavy growths and to make good feed. Where cowpeas are grown alone for this purpose the reported yields range from 1½ to 2 tons to the acre. Where grown for seed they are usually planted in rows and yield from 10 to 30 bushels to the acre.

A number of vegetables do well on this type, but they are grown only for home use. Crops are not generally rotated systematically, and it is not unusual to find fields that have produced 10 successive crops of cotton. A growing practice is to plant corn one year and cotton the next, sowing cowpeas between the corn rows at the last cultivation. A less common practice is to follow corn with oats and then sorghum or cowpeas or a mixture of the two. When this is removed for hay or grazed down the land is flat broken and put in cotton the following year. This is a good practice, but it could be improved by introducing a winter cover crop of oats, rye, vetch, or bur clover just preceding the cotton, the cover crop to be plowed under in the spring before cotton-planting time.

Most of this type is deficient in humus, a good supply of which is essential for the development of the proper bacterial flora. It increases the water-holding capacity of the soil, makes it more resistant to erosion, and improves the structural conditions. Where the soil is thin deep fall plowing and the incorporation of organic matter will do much to develop and maintain better crop yields. Where, however, the fine sandy loam has a good depth, deep plowing is not

so essential and the greatest improvement can be secured by plowing under organic matter. This can be incorporated either in the form of stable manure or by plowing under grass, grain stubble, or green manuring crops, such as cowpeas, vetch, and rye. Vetch and rye or vetch and oats or crimson clover used as winter crops and cowpeas or soy beans as summer forage ought to have an important place in the crop systems for this type. They will not only increase the humus content, but will add materially to the productiveness of the soil.

This type is well adapted to the production of garden truck, particularly Irish and sweet potatoes, but until conditions change it will probably be used for general farming. The production of fruit, although unimportant at present, would indicate that the soil is particularly valuable for some varieties of apples and for apricots. Peaches are rather uncertain, on account of late spring frosts.

The Louisa fine sandy loam is valued at $5 to $40 an acre, according to location and state of improvement.

Louisa fine sandy loam, shallow phase.—An important phase of this type (indicated by crosslines on the map) is developed in the southern part of the county, north of High Pine Creek and west of its tributary, Jones Creek, while detached areas occur east and west of the Tallapoosa. The soil is quite like that of the typical Louisa fine sandy loam, but the depth of the surface material is not quite so great, rarely exceeding 8 inches, with 24 inches about the maximum depth of the subsoil. The underlying rock is encountered anywhere from that depth to near the surface, and frequently the rock outcrops in ledges. Fragments of quartz and, less commonly, schist, are scattered over the surface, and quartz seams occur in the underlying clay. The subsoil is quite micaceous, but mica is not conspicuous in the soil, except where the underlying rock approaches the surface.

This phase is much less productive than the typical soil. The best yields are made in seasons of heavy rainfall, while crops suffer considerably in dry weather, as the position of the underlying tilted schist promotes excessive drainage. Yields of 5 to 10 bushels of corn and one-sixth to one-half bale of cotton to the acre are reported with the ordinary application of 150 pounds of fertilizer for corn and 200 pounds for cotton. To increase the production of this phase it will be necessary to incorporate a good supply of organic matter and to deepen the soil portion considerably by deeper plowing, so as to modify the structure of the immediate subsoil and thus obviate excessive drainage. The deeper the plowing is done the better will be the result. It is suggested that the disk plow, or subsoiler, be used, so as not to bring up too much of the raw clay subsoil, and that the plowing be to a depth of at least 15 inches. The organic matter will add to the water-holding capacity of the soil and the settling of the subsoil will reduce the percolation.

LOUISA CLAY LOAM.

The Louisa clay loam consists of a brownish to reddish-brown clay loam or sandy clay loam, from 3 to 6 inches deep, resting upon a bright red, compact clay, which is usually from 2 to 5 feet or more in depth. Upon the surface is found a scattering of quartz fragments, with occasional fine particles of schists, while veins of quartz cut through the soil and subsoil. Mica is conspicuous in the subsoil, especially as the underlying rock is approached, but not so noticeable in the upper subsoil where the rocks have weathered deeply. The presence of mica in this type imparts the greasy feel so characteristic of the subsoils of the Louisa series. The areas in which mica flakes are prominent in the subsoil are locally styled "isinglass land."

The Louisa clay loam is derived from micaceous schists. The type really represents a shallow or eroded phase of the Louisa loam or Louisa fine sandy loam, being developed in areas from which the surface soil has been largely removed by long-continued surface washing. It occupies valley slopes and rolling uplands, and is typically developed south of Newell and bordering the Little Tallapoosa River. Another large area occurs south and southwest of Graham, while detached areas which have been subjected to surface washing are found all through the Louisa series.

Corn, cotton, wheat, oats, hay, and fruits constitute the important products grown on this type. More cotton and corn are grown than anything else. Cotton yields about one-third bale to the acre; corn, 12 to 15 bushels; oats, 15 to 20 bushels; and wheat about 5 bushels. The yield of cowpea hay ranges from 1 to 2 tons to the acre without fertilizer. With an average application of 200 to 300 pounds of a mixture analyzing 10 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash, cotton will average two-thirds of a bale. Corn yields will range from 20 to 40 bushels with an application of 100 to 150 pounds to the acre, although 40 bushels and more have been obtained by the generous use of stable manure. Spring oats without fertilizer will range in yield from 10 to 15 bushels per acre, but fall oats fertilized with an application of 100 to 150 pounds to the acre yield from 30 to 40 bushels. The yield of wheat is very low, rarely exceeding 10 or 15 bushels to the acre, and little of this crop is grown. The peach crop is quite uncertain, on account of late spring freezes, but apples are more successful. The favorite varieties grown on this type are the Horse, June, and May, with the Russet and Yeats favorite winter varieties. Plums also do well, particularly the Wild Goose and Japanese plums, while the Concord and Scuppernong are the favorite varieties of grapes.

Crops are not generally rotated systematically on the Louisa clay loam and it is not unusual for the same crop to be grown continuously

on the same field for five years or more. On a small proportion of this type a common practice is to alternate corn with cotton and plant cowpeas in the corn just before the last cultivation. Occasionally oats or wheat are sown on corn land and when removed the following summer a crop of cowpeas or a mixture of cowpeas and sorghum grown for hay. Crops on this type do not suffer materially during extremes of wet or dry weather, particularly when the soil has been properly prepared, but where the seed beds are shallow the soil washes badly and crops are damaged. Lack of moisture during periods of drought also frequently causes loss. During showers the soil generally runs together and in subsequent dry weather forms a light crust over the surface, but such crusting is not likely to follow where cowpeas were grown the previous year or where the soil is kept well supplied with organic matter.

The position of much of this type favors erosion. Spots of red clay, or "galls," are of frequent occurrence. These spots are purely local and represent exposures of the underlying clay from which the soil has been removed. They can be improved by fall plowing, winter cover crops, and liming. The usual depth of plowing is 4 inches or less, although a few farmers are plowing deeper. Improvement is readily apparent where deeper plowing is practiced, the surface wash being lessened considerably. Over most of this type 2 or 3 inches of the subsoil can be turned to the surface without prejudice to the succeeding crop. However, the depth of plowing should not be increased too suddenly with turning plows. A seed-bed depth of 7 to 10 or 12 inches should be secured gradually. The humus content of the soil is quite low and should be materially increased. This not only binds the soil together and makes it more difficult to wash, but increases its water-holding capacity. Deep plowing, with the incorporation of organic matter and more frequent use of winter cover crops, is imperative if this soil is to be protected from surface erosion and its productiveness maintained.

The land is valued at from $5 to $20 an acre, depending on location and improvements.

Louisa clay loam, shallow phase.—One of the most important phases of the Louisa clay loam is indicated on the map by crosslines. This has probably a greater extent than the more typical soil, and occurs in the southern part of the county north and south of High Pine Creek and east and west of the Tallapoosa River.

This phase consists of a heavy loam or clay loam, 1 to 4 inches deep, resting upon a bright red, friable clay, which rarely extends below 24 inches, while in much of it the depth to the underlying rock is not over 12 inches. This clay usually rests upon the underlying mica schist, while partially decomposed extensions of the schists come to the surface at a marked angle to the horizontal. Quartz

fragments and small chips of mica schists are of frequent occurrence over the surface, while quartz seams cut through the soil section in many places. Mica is very conspicuous in both soil and subsoil, becoming more abundant as the underlying rock is approached. This mica gives the type a greasy feel.

This phase occupies the same topography as the more typical soil and is subjected to serious surface washing. The soil is easy to work and responds to good treatment. The best crops are usually produced during seasons of heavy rainfall, but they suffer materially in dry weather, on account of the proximity of the underlying rock to the surface, coupled with the increased percolation of water downward through the somewhat porous bedrock. Yields of cotton range from one-sixth to one-third bale; of corn, from 8 to 15 bushels; of oats, from 15 to 20 bushels, and of wheat, from 5 to 10 bushels to the acre. Fall oats are not always successful, on account of winter freezes, but trouble from this source can be obviated or reduced to a minimum by more thorough preparation. This phase is deficient in organic matter.

To increase the productiveness of this soil it will be necessary to incorporate plenty of organic matter and to deepen the seed bed so as to reduce the loss of moisture through percolation. Plowing should be thorough and deep, at least 8 or 10 inches. Where the soil covering is very shallow it may be necessary to roll the land after plowing and to cultivate very shallow. Cover crops should always be grown in order to protect the soil from the heavy rains of winter and spring.

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

Mechanical analyses of Louisa clay 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.*
413322½, 413347....	Soil.....	1.0	2.7	2.6	22.2	9.0	37.0	25.1
413323, 413348.....	Subsoil.....	3.3	8.2	5.2	18.8	6.2	23.2	34.7

LOUISA SLATE LOAM.

The Louisa slate loam consists of a light-brown or brown loam, from 2 to 10 inches deep, underlain by a red silty clay, resting upon the underlying rock at depths ranging from 24 to 50 inches. The surface is generously strewn with fragments of schist, and, less commonly, of quartz. These slabby or slaty schist fragments are usually present in sufficient quantities to interfere more or less with cultivation, and are less conspicuous on the ridges than on the slopes, where erosion has been more active and removed the soil material.

Smaller fragments of micaceous schist, usually in thin leaves or flakes, are nearly everywhere abundant on the surface and to a less extent throughout the soil.

The Louisa slate loam is derived from the underlying mica schists, which vary from gray or pearly gray to reddish or even grayish black in the case of the more graphitic rocks. The mica is so fine and so common throughout the rock mass that it gives the rock a distinct pearly luster. Its presence is not generally apparent in the soil or subsoil, although there is enough of it to impart a slightly greasy feel.

The Louisa slate loam, as typically developed, occupies hilly topography, but the soil does not wash or erode as badly as might be expected under the existing surface conditions, partly on account of the protection or support afforded the soil material by the rock fragments on the surfac Occasional " gall " spots, or exposures of the clay subsoil, are seen where cultivated areas or old fields have been carelessly handled.

Comparatively little of the Louisa slate loam is under cultivation, the most of it being covered with pine, oak, and hickory, with an undergrowth of huckleberry bushes, broom sedges, some vetch, or other wild legumes. The largest typically developed area occurs along the west county line, between Hurricane Creek and Abner, and extends in a northeasterly direction to Wedowee and beyond. An area is also found on the uplands between the forks of the Tallapoosa River, north and southwest of McBurnett Ford. Here the soil mantle is quite deep, the weathering has been more complete, and the rock fragments which usually litter the surface are not so large or so abundant.

One of the most important phases of this type occurs on the ridge east of Cornhouse Creek and extends northeast to the county line near Sewell. This area includes Potash and Haywood, and part of it is known as the Blackjack Ridge. Two or three isolated areas occur north and south of Gaston Branch. This phase varies from a heavy fine sandy loam to a brown silt loam, ranging from 3 to 10 inches in depth. The subsoil is a friable brownish-red clay, which usually extends to a depth of 3 feet or more.

This phase represents the residual products of a mica schist, which in places is interbedded with graphitic schist. It has about the same value as the typical soil, but the topography in the eastern part of the area is quite rugged, especially where it includes Blackjack Mountain and the neighboring hills. Occasionally the soil approaches a clay loam in texture, especially where erosion has been active. That part of this same area lying on the south side of the ridge extending toward Waldrep and south toward Omaha and that part on the north side of the ridge east of Byron and northwest of Sewell rep-

resents another phase. Here the surface 2 to 4 inches is a fine sandy loam, but beneath this heavier material is encountered, which is turned up in plowing and mixes with the surface mantle, converting the whole into a light loam or heavy fine sandy loam, with a yellowish or yellowish-red color, changing to red as the subsoil is approached. This phase has about the same value as the more typical areas, but the fragments of schists over the surface are not so conspicuous and the topography is better than in the more typical areas.

The following crop yields are reported for the Louisa slate loam: Cotton, one-third to one-half bale to the acre, without fertilizer, and from one-half to three-fourths of a bale with an application of 200 pounds of fertilizer to the acre; corn, from 20 to 30 bushels to the acre with the use of 100 pounds of fertilizer, and 12½ to 15 bushels without fertilizer; and wheat, from 10 to 20 bushels to the acre. In places the last-named crop is said to rust badly. Oats make a good growth in fall and spring, but the fall crop yields much the better—from 20 to 30 bushels to the acre. Broom sedge is used for early spring pasturage and Bermuda for summer grazing.

The soil often has a good supply of organic matter. It is not very deep, but crops do not suffer during periods of drought or from heavy rains, except where they are subjected to side-hill wash. The land composed of this type in general is so hilly and rough as to preclude the use of improved farm machinery, and crops can not be as economically produced here as in more favored sections. The rougher areas should be used for the pasturing of live stock.

Farm lands composed of the Louisa slate loam are valued at $5 to $15 an acre.

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

Mechanical analyses of Louisa slate 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.*
413327	Soil	3.5	4.5	1.6	14.0	11.5	47.1	17.5
413328	Subsoil	3.0	2.0	.5	14.0	9.7	25.1	45.0

LOUISA LOAM.

The Louisa loam is a yellowish-brown to light-brown loam, 6 to 12 inches deep, underlain by a compact, brittle red clay, usually exceeding 3 feet in depth. Where this type has been under cultivation a long time the surface inch or two frequently consists of a heavy fine gray sandy loam, grading into yellow loam. In fallow fields and timbered areas the soil is a distinct loam or silty loam. Small frag-

ments of schist and quartz, rarely more than an inch in diameter, are scattered over the surface and disseminated throughout the soil section in varying quantities, usually sufficient to give the surface soil a slightly gravelly character. This gravel is not so conspicuous where the land is freshly plowed, but is quite apparent where it has not been disturbed, and also on the surface of fields after rains. Mica scales are noticeable in the soil, but less so than in the subsoil. The subsoil has the characteristic greasy feel of the Louisa material.

The Louisa loam is derived from a greenish to brownish micaceous schist occurring more as a massive rock than slabby or slate-like formations, as in the case of the Louisa slate loam. On weathering, it breaks up into angular fragments. This rock weathers very slowly and gives rise to a rolling to strongly rolling country. Throughout these rocks occur veins of kaolin derived from feldspar, and to a less extent ores bearing copper pyrites, silver, and iron. These formations have no direct influence upon the soil, or at most only modify it in spots. Occasionally the soil is considerably deeper along the foot of slopes, owing to accumulation of material by wash from the hillsides. In some places the depth to the compact clay subsoil is 2 feet. Such spots retain moisture well and are exceptionally productive. "Gall" spots, or places where the underlying clay is exposed, are occasionally found in patches too small to map. On the river slopes the soil is shallower and rock outcrops are more numerous.

Comparatively little of the Louisa loam is under cultivation, being largely covered by a thin growth of pine and oak. The greater part of the more valuable longleaf pine has been removed Under average conditions, especially in timbered areas, the soil is fairly well supplied with organic matter. Partly on this account erosion has not beer so destructive as on some of the other types, although improvident methods have occasioned some soil erosion.

Freshly cleared or "new land" gives good results with the general farm crops for a number of years, but with the continuous production of corn or cotton the yields are gradually lowered and recourse is had to commercial fertilizers to maintain the production. Cotton yields from one-half to three-fourths bale per acre on new ground, and from one-third to one-half bale, with the use of 100 to 300 pounds of fertilizer, on old land. Corn on new ground makes from 25 to 40 bushels, or an average of about 20 bushels with an application of 100 pounds of fertilizer. The yield of oats ranges from 15 to 30 bushels, and of wheat from 5 to 15 bushels per acre.

Fruit growing is confined largely to the production of apples and peaches for home use. The latter fruit is quite uncertain on account of late spring frosts. One orchard of apricots on this type was found in a particularly thrifty condition. The owner reported that the crop had never failed, and it would seem that the production

could be profitably extended. Among the apples the Yeats is the favorite, although some Ben Davis, Red Reese, Horse, and June apples are grown. It is reported that good yields of crops can be secured on the less productive areas by the use of stable manure. Where the surface features are not too rough this type ought to be put under a more definite system of management, which should include the frequent use of winter cover and summer forage crops. The land should be more thoroughly prepared and a good organic content maintained.

In the more rugged country land of this type could be profitably used for pasturing live stock.

Farm lands of the Louisa loam are valued at $5 to $15 an acre.

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

Mechanical analyses of Louisa 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.*
413312	Soil	3.3	7 1	3.4	33.6	22.5	20.4	9.4
413313	Subsoil	1.3	3.3	4.2	25.3	16.5	22.2	26.5

DURHAM FINE SANDY LOAM.

The Durham fine sandy loam consists of a gray fine sandy loam, underlain at about 10 inches by a light, friable fine sandy clay of a yellow color, which extends to a depth of 5 feet or more. Over the surface are strewn angular fragments of quartz, while quartz veins frequently cut through the soil section, as they do in practically all the upland soils of the general region. Occasionally small spots of gravelly soil are encountered, and in places the surface soil has been washed so as to expose the yellow subsoil. Weathering has been so deep that it is difficult to determine the exact character of the parent rock. A number of field indications, such as an occasional fragment of rock, lead to the belief that the rock is a fine-grained gneiss.

The Durham fine sandy loam is quite limited in distribution. A typical area occurs north of Rock Mills, beyond Vineyard Branch, and there is a large area east of the headwaters of the same branch. Developments also occur to the west and north of Pittman and 1¼ miles east of Tenant. Less typically developed areas occur in the vicinity of Peavy and in small spots bordering the bottoms of High Pine Creek, where the soil has been modified slightly by the wash from the uplands, giving it in places the texture of a heavy fine sandy loam.

The Durham fine sandy loam occupies level to gently rolling uplands. Most of it is under cultivation, principally to cotton and corn.

A considerably larger proportion of this type is devoted to cotton, corn being confined mainly to the neighboring bottoms. It is not considered a very productive soil, but this estimate can be attributed largely to improvident methods of cultivation. The following yields are reported: Cotton, 400 to 600 pounds (seed cotton) to the acre, with an application of 100 to 150 pounds of fertilizer. An acreage yield of 1,000 pounds was reported with the use of 300 pounds of fertilizer. From 10 to 15 bushels is the usual acreage yield of corn, although 40 bushels is sometimes obtained with the use of stable manure and fertilizer. Some oats are grown for pasturage or summer forage, but there is practically no grain grown on this type. The less typical areas bordering High Pine Creek produce slightly heavier crops of cotton, although the yield of corn is about the same. The crops on this type do not suffer materially in periods of drought, but are sometimes damaged in wet weather on account of the level character of the surface and consequent poor drainage.

The Durham fine sandy loam is susceptible of easy improvement by the incorporation of organic matter with the soil and the more frequent production of leguminous forage crops. Organic matter can be supplied by the use of stable manure or by plowing under cowpeas, soy beans, vetch, bur clover, rye, oats, and barley. The legumes will add valuable organic matter through decomposition of the roots even where the crop is grazed off or cut for hay. They also improve the soil by adding atmospheric nitrogen. Once a good supply of humus is secured this type should be put under a definite cropping system, which should include cover crops for the winter and leguminous forage crops for the summer, in addition to corn and cotton.

This is one of the best soils in the area for the economical production of crops, as nearly all kinds of improved machinery can be used to advantage. The type is very well adapted to vegetables, but the distance from market would probably not justify any extensive development of this industry at present. Sweet potatoes, Irish potatoes, and melons do well.

The Durham fine sandy loam is valued at $10 to $30 an acre.

DURHAM SANDY LOAM.

The Durham sandy loam consists of a gray, medium-textured sandy loam containing some coarse sand and quartz particles, grading at depths of 5 to 15 inches into a yellow friable clay. This in turn is underlain by a heavy clay carrying some coarse sand and quartz particles, the latter becoming more abundant as the parent rock is approached. The soil profile rarely exceeds 4 feet and in many places is not more than 2 or 3 feet. In some places the soil is very shallow or bedrock comes to the surface. Such areas, where

large enough, were mapped as Rock outcrop. Over the surface of the Durham sandy loam are found fragments of quartz and of the granite from which the type is largely derived. Coarse-grain gneiss has also contributed to its formation.

This soil is quite limited in extent. It is typically developed in the vicinity of Rock Mills, along Wehadkee Creek and its tributaries. An area occurs west of Rock Mills and two small ones northeast of the same town. Near the headwaters of Wild Cat Creek are found two small patches of typical material and another one mile west of Forester Chapel. Two small spots are found on both sides of the river at Hesters Ford and a larger area west of Blake Ferry, while a small patch borders the bottoms of Caty Creek, in the southern part of the county. The Durham sandy loam occupies low valley land, usually abutting water courses or bottoms. The surface features are usually level to gently rolling.

This is one of the least productive types in the area, but it is susceptible of great improvement. It is used chiefly for the production of cotton and corn, the greater acreage being devoted to the former crop. The reported yields of cotton range from one-sixth to one-third bale per acre, and of corn from 5 to 10 bushels. Oats and wheat are rarely grown and cowpeas only occasionally. The type is so well drained, on account of its open and porous nature, that crops frequently suffer during periods of drought, while on the more level lands heavy rains do considerable damage, on account of insufficient drainage. There is very little organic matter in the soil, as a result of the clean culture required for cotton and corn. Cotton is usually grown for years on the same fields, with an occasional change to corn. The productiveness of this type can be improved materially by incorporating organic matter and by putting the land under a definite system of crop rotation, which should include winter cover crops and summer forage. The type is a splendid soil for early vegetables. Sweet potatoes and melons do well.

Lands of this type of soil are valued at $5 to $40 an acre, depending largely upon location.

CECIL CLAY LOAM.

The Cecil clay loam consists of a brown to reddish-brown clay loam to sandy clay loam, underlain at 4 to 8 inches by brittle red clay, which usually extends to a depth of 4 feet or more. Fragments of quartz are usually scattered over the surface, while grains of coarse sand and particles of quartz are frequently encountered in the subsoil.

The Cecil clay loam occupies slopes and ridges over which erosion has been comparatively active. The soil has been formed through the decay in place of gneiss and granite, mainly where the gneiss grades into schist. Where the parent rock is fine grained, coarse

sand grains are not so common in the subsoil. Quartz veins frequently stand intact through the soil section.

The type has a very limited distribution in Randolph County. It is typically developed northeast of Roanoke, on the south side of High Pine Creek, and in detached areas around Wehadkee, while isolated areas also occur in the vicinity of Swan Hill. A large area of less typical material occurs on the east side of the river north of Island Ford. Here the soil is derived from pegmatite and hornblende schists. Large flakes of mica are not uncommon on the surface and through the soil. The areas lying to the north and southwest of Roanoke differ from the typical soil in that they are derived from interbedded gneiss, mica schist, and hornblende schists, are heavier in texture, and occupy a troughlike position. This is a stronger soil for general farm crops than the more typical areas.

The Cecil clay loam is a very shallow soil and is subjected to serious washing. The best yields are usually made in wet years. Crops suffer materially in dry weather, especially where a pulverulent seed bed has not been maintained. The sandy soils of the Cecil series are said to do much better in dry years than the Cecil clay loam.

The type is quite variable in point of productiveness in different parts of the county, the yields depending in a large measure upon the thoroughness of preparation of the seed bed and the protection afforded against surface wash. The lowest yields are generally obtained where the soil is shallow, and the highest from those fields having the deepest soil or seed bed. Cotton yields range from one-fourth to one-half bale, corn 15 to 40 bushels, oats 20 to 40 bushels, and wheat 15 to 20 bushels per acre. The incorporation of organic matter and deeper plowing improve the soil greatly, making it more retentive of moisture and providing a deeper root zone. The turning up of a small quantity of the subsoil by the use of the turning plow is not generally detrimental to crops on this type. The better plan is to extend the plowing depth gradually either with a turning plow, disk, or subsoiler until a good pulverulent bed is secured to a depth of 8 or 10 inches. On account of its sloping surface, the soil should be protected from the heavy rains of winter and early spring by cover crops of oats, rye, vetch, or bur clover, while a systematic rotation should be practiced that will make provision for these cover crops in addition to summer forage, in order to develop and maintain the productiveness of this type. Hillside terraces are of much value in checking erosion.

This land is valued at $10 to $35 an acre.

Cecil clay loam, heavy phase.—One of the most important phases of the Cecil clay loam is represented by cross lines on the map. This consists of a brown or reddish-brown, rather mellow heavy clay

loam, 4 to 10 inches deep, grading into a stiff reddish-brown heavy clay, usually exceeding 2 feet and sometimes 5 feet in depth. Over the surface is a scattering of quartz or quartzite and schist fragments. These are rarely numerous enough to interfere with cultivation, but where this is the case the areas are indicated on the map by appropriate symbol.

This phase usually occupies the lower slopes, rarely extending to the crests of ridges or tops of hills. It is derived from hornblende schist and, to a limited extent, from chlorite schist. It covers about the same area as the typical soil and is typically developed in the large areas including the towns of Wadley and Louina. Another area includes Copper Mine, while irregular areas occur in the northeastern part of the county. Along Cornhouse Creek it is well developed. Detached areas of more limited extent occur in other parts of the county.

This is one of the strongest soils in the county for general farm crops, and generally considered better for corn and grain than for cotton. Corn yields from 30 to 60 bushels per acre; oats from 20 to 50 bushels; wheat, 15 to 25 bushels; and cotton from one-half to three-fourths bale. The best yields are obtained in seasons of heavy rainfall and the lowest in dry years. The soil is difficult to work, unless in exactly the right condition with respect to moisture content. It does not scour readily from the plow and clods are turned up if the land has dried out too thoroughly.

This phase is not subject to the same excessive erosion as the typical Cecil clay loam, although the soil portion is shallower. Most of the land is prepared in the fall and rebedded the following spring. Deep fall plowing, with winter cover crops following, and the incorporation of organic matter, will do much to improve the tilth and capacity for retaining moisture.

Typical areas of Cecil clay loam may be purchased for $10 to $15 an acre, while the heavy phase brings from $20 to $100, depending on location.

CECIL SANDY LOAM.

The Cecil sandy loam to a depth of 3 to 12 inches consists of a gray to light-brown medium sandy loam, grading rather abruptly into a heavy red clay, in which sharp sand grains and mica flakes are conspicuous. This clay subsoil continues to a depth of 3 feet or more.

The texture of the surface soil varies from fine to coarse sandy loam, the average depth being 6 inches. Quartz, some granite, and other rock fragments are commonly found on the surface and occasionally in sufficient quantities to interfere with cultivation.

The Cecil sandy loam is derived principally from gneiss and granite. The quartz veins which occur through these rocks have not

weathered to any appreciable extent and often cut through the soil section. The type is largely developed in the southeastern part of the county, particularly in the neighborhood of Roanoke and Rock Mills. It also occurs in the vicinity of Almond, extending to the west county line and northeast along part of the Malone Road. It is likewise developed on the uplands south of Cornhouse Creek, along Wild Cat Creek, and the county line southeast of Louina.

In the vicinity of Rock Mills, along and near its contact with the Durham sandy loam, the texture is about the same as that of the latter type, but the subsoil has a lighter shade, being dull red or salmon color. In some places the boundary between the Cecil and Durham sandy loams has been rather arbitrarily drawn. This is true of the type as it occurs near the water courses southwest of Almond. In places the soil has a gray or bleached appearance, owing to the lack of organic matter. In other places, where there is a moderate organic content, the soil is darker than the average.

This type occupies level to gently rolling uplands and ridges. It is the least eroded soil in the area, although there are spots in which the soil has been washed off and the underlying clay exposed. The greater part of the type is under cultivation. It was formerly covered with longleaf pine and oak.

The Cecil sandy loam has been producing crops longer than any other soil of the area. Some of it has been under constant cultivation for nearly 60 years. It is used chiefly for the production of cotton, corn, oats, wheat, and forage crops, and to a slight extent for garden truck. Cotton yields from one-third to one-half bale per acre, with an application of 200 pounds of fertilizer, and corn from 6 to 15 bushels with the same fertilizer application. Spring oats are not grown to any considerable extent. Fall-sown oats yield from 10 to 25 bushels, the best yields being secured where the surface is top-dressed with manure. Little or no wheat is grown on this type. Cowpeas do well and acreage yields ranging from 1 to 1½ tons of forage are reported. Yields have been materially increased by individual farmers through the incorporation of organic matter and systematic rotation, including winter cover crops of grain and the production of summer legumes. The soil lies well, is easy to work, and crops mature early on it. It is better adapted to the production of early truck than of general farm crops, but conditions at present are not suitable for this change.

Lands of this type are valued at $20 to $40 an acre.

CECIL FINE SANDY LOAM.

The Cecil fine sandy loam consists of a gray fine sandy loam, 3 to 10 inches deep, underlain by a red brittle clay, extending usually to a depth of 3 feet or more. The surface is strewn with fragments of

quartz and, less commonly, of gneiss, while quartz veins are common. Over areas too small to map rock fragments are present on the surface in quantities sufficient to interfere with cultivation, especially about the heads of drainage ways.

The type is derived largely from fine-grained gneiss. It occupies higher and more rolling country than the Cecil sandy loam and is much less extensively developed. Typical areas occur on the ridge north and northeast of Roanoke, beyond High Pine Creek, including the hamlets of White and Pittman, also on the ridge between Roanoke and Pittman, and southeast of the latter town. An area is also found west of Wehadkee and another one along the county line northeast of Wehadkee and Pittman, while small isolated areas occur in other parts of the county.

The Cecil fine sandy loam is not so uniform in depth as the sandy loam type of the series. It occupies higher ridges and is subjected to more serious erosion. Some of the soil is quite deep, while in other places it is very shallow. Numerous "gall" spots occur, in which the clay subsoil has been exposed by surface wash.

Corn, cotton, wheat, and oats are the important crops. The following average acreage yields are reported: Corn, 15 bushels; oats, 15 bushels; wheat, 8 bushels, and cotton, one-third bale. These have been secured by the use of 100 to 200 pounds of ordinary low-grade commercial fertilizer. As good and better results have been obtained by the use of stable manure.

Where the covering of fine sandy loam is shallow and, on account of slope, exposed to severe erosion, the soil should be broken to a depth of at least 8 or 10 inches and a good supply of organic matter worked into the pulverized stratum. Also, winter cover crops of rye, oats, bur clover, and vetch should be grown regularly, unless effective hillside terraces are provided. Where the sandy soil is deep the necessity of deep plowing is not so urgent, but a greater supply of organic matter is needed. This may be incorporated in the form of stable manure or by plowing under grass, grain stubble, and green manuring crops, such as rye, oats, barley, crimson clover, vetch, cowpeas, etc. A method preferred by most farmers is to graze down the forage crops with live stock and then turn the stubble under. This type should be put under some definite system of crop rotation, which should include cover crops for the winter and leguminous forage for the summer, in addition to corn and cotton. Land of this type is valued at $10 to $25 an acre.

CECIL STONY LOAM.

The Cecil stony loam consists of a brown or reddish-brown loam, from 3 to 7 inches deep, resting upon the typical red clay subsoil of the Cecil series, which usually extends to 4 feet or more. The surface

is covered with fragments of quartz and other rock in quantities sufficient to interfere with cultivation.

One of the largest areas of this type occurs on the slope of the ridge northeast of High Shoals. It is derived from the decay in place of the underlying gneiss, although local ledges of quartzite occur. Some mica schist also is present. To the east and west of the Central of Georgia Railway, along the county line south of Roanoke, the surface soil is a heavy fine sandy loam. Here the rock fragments consist largely of quartz, although the soil is derived from granite and hornblende schist. The same is true of those areas along the county line southeast of Peavy and in the vicinity of Wadley.

With the exception of the body south of Roanoke, none of the type is under cultivation. The timber growth comprises several species of oak, hickory, and pine. The soil is so thickly strewn with rock fragments that it is usually avoided by the farmers, on account of the difficulty of working it, although cultivated patches indicate that it is a strong, productive soil. When the better soils are all brought under cultivation the rocks will be picked from much of this type and the land cultivated.

CECIL STONY SANDY LOAM.

The Cecil stony sandy loam consists of a gray sandy loam, 4 to 10 inches deep, grading rather abruptly into heavy red clay. The surface of the type is generously strewn with rock fragments, mainly of quartz, and of all sizes and shapes.

The type is derived largely from the weathering of gneiss. The topography is sloping to strongly rolling. The soil is very similar to the Cecil sandy loam, the essential difference being the greater abundance of rock fragments on the surface. It is limited in distribution to an area bordering the county line southwest of Wadley, although small patches occur through the Cecil sandy loam. Where these areas were large enough, they were indicated by symbol on the map.

The Cecil stony sandy loam is quite deficient in organic matter, though crops are said to withstand periods of drought better than on the Cecil sandy loam. It is used for cotton, corn, and oats, and the following yields are reported: Cotton, one-third to one-half bale; corn, 8 to 15 bushels, and oats, 10 to 15 bushels per acre. It is used to some extent for the production of apples, plums, and grapes, for which it is well adapted.

The stony character of the soil interferes slightly with cultivation, but when the type is plowed deep it is not so difficult to work. For the production of forage and grains it is necessary to follow the deep breaking with a drag, in order to smooth the surface so that these crops may be easily mowed. The productiveness of this type can

be developed and maintained by a system of crop rotation, including winter cover crops and summer forage. Lands of this type are valued at $10 to $30 an acre.

IREDELL LOAM.

The Iredell loam consists of a brown, greenish-brown to chocolate-brown gritty loam, 6 to 10 inches deep, underlain by a reddish-brown or dingy-brown clay loam or clay, which quickly grades into a tough plastic clay of a yellowish or greenish-yellow color. The total depth of the soil and subsoil varies from about 18 inches to 5 feet. The surface is generally strewn with flat or slabby fragments of hornblende or chlorite schist, which characteristic has given rise to the local name of "red slate land."

The type is derived from the underlying hornblende and chlorite schist and is developed as nearly level to slightly sloping areas near the water courses. Areas occur on the public road east of Wehadkee Creek, with isolated patches bordering the bottom land of the same creek south and southwest of Pittman. Another very small area surrounded by Cecil clay loam occurs west of Cornhouse.

The Iredell loam is used for the production of cotton, corn, oats, and wheat, cotton yielding from one-third to two-thirds bale per acre, oats, 20 to 35 bushels, wheat, 18 to 20 bushels, and corn, 25 to 45 bushels. A yield of 4 bales of cotton, weighing 520 pounds each, was reported on 3 acres with the use of 300 pounds of a "blood and bone" mixture to the acre. The seed used was Cook's Improved, which is said to do much better on this type than the Russell Big Boll. It is claimed that the land makes good yields in both dry and wet seasons.

The soil is quite difficult to work and does not scour readily from the plow. This, however, could be obviated by the more generous incorporation of organic matter.

This type is a strong soil for the growth of general farm crops, but it should be put under a more definite system of soil management, which should include winter cover crops and summer forage. The land is valued at $20 to $30 an acre.

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

Mechanical analyses of Iredell 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.*
413301	Soil	7.5	6.7	3.8	19.1	21.3	28.8	12.4
413302	Subsoil	1.9	4.6	3.1	14.8	14.0	26.4	34.7
413303	Lower subsoil.	1.5	2.0	1.5	10.1	18.5	27.4	38.4

YORK FINE SANDY LOAM.

The York fine sandy loam is a gray fine sandy loam, from 5 to 10 inches deep, underlain by a compact yellow clay, which usually exceeds a depth of 3 feet. Quartz fragments are of common occurrence on the surface. Mica is not very conspicuous in the soil or immediate subsoil, but becomes more noticeable as the parent rock is approached.

This type is derived from the weathering in place of the underlying mica schists. Its distribution is limited to a small area 2½ miles west of Peace and another near the county line northwest of Kaylor.

The York fine sandy loam is used for the production of corn, oats, and cotton, the following yields being reported: Cotton, from one-third to one-half bale; corn, 10 to 15 bushels; and oats, 15 to 25 bushels per acre.

The methods of improving this type are the same as recommended for the Louisa fine sandy loam, but greater care should be exercised in turning up the subsoil to the surface with the ordinary turn plow in the more shallow areas, as it is said to be detrimental to crops. This can be avoided by the use of the disk plow. Lands of this type can be purchased for $10 to $20 an acre.

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

Mechanical analyses of York 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.*
413335	Soil	1.5	3.0	2.0	16.1	20 1	47.7	8.8
413336	Subsoil	.8	2.4	1.6	13 4	18.6	42.9	19.7

WEHADKEE LOAM.

The Wehadkee loam consists of a gray to white compact silty loam to silt loam, 4 to 6 inches deep, resting upon a light grayish yellow to nearly white compact silty clay, which at about 24 inches passes into a mottled yellowish and gray clay and then into gray or white at lower depths.

The Wehadkee loam is a first-bottom alluvial soil. It is confined to the valleys of Vineyard and Wehadkee Creeks and tributaries of Wedowee Creek south and east of Wedowee. Most of this type is poorly drained. Even the cleared areas, which are moderately well drained, are subject to occasional overflow. No crops except corn and grass do well, and these only in very dry seasons. The type is undoubtedly best suited to grass. The underlying clay is used near Rock Mills for the manufacture of earthenware and brick.

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

Mechanical analyses of Wehadkee 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.*
413305	Soil	1.8	5.8	4.2	25.4	14.7	35.4	12.3
413306	Subsoil	.0	1.3	3.0	23.5	16.9	38.0	16.5

CONGAREE LOAM.

The Congaree loam is a brown to reddish-brown silt loam, varying in depth from 8 to 15 inches, underlain by a light silty clay of yellowish-brown or reddish-brown color, more or less mottled with rusty brown and yellow. The depth to the immediate subsoil of this type is quite variable. As it nears the bluffs it may exceed 3 feet, while nearing the streams the river-washed sand or sand and gravel comes closer to the surface. Mica flakes are abundant in this type, particularly where the streams traverse the Louisa soils.

This type occupies first bottoms of the rivers, creeks, and branches. It consists of alluvial material washed from various soils of the several drainage basins, transported often long distances, assorted by currents of different velocities, and finally deposited in the flood plains of the streams. Some areas are moderately well drained, although all of the type is subject to occasional overflow.

The Congaree loam is an easy soil to work and is well supplied with organic matter.

A large part of the type is covered with timber. Where cultivated it is used for the production of corn, cotton, and oats, the greater proportion of the acreage being in corn. Cotton is usually grown on the higher parts of the bottoms. The ordinary yields range from one-third to one-fourth bale per acre, though higher yields are occasionally obtained with the use of 200 to 300 pounds of fertilizer per acre. On most of the type, however, the returns are said to be uncertain, on account of the rust. The yield of corn ranges from 25 to 40 bushels per acre. Where the fields have been under cultivation for a great many years applications of cottonseed meal and acid phosphate are made. Oats do well, the yield ranging from 35 to 50 bushels per acre. Wheat is rarely grown, on account of the rust.

CONGAREE FINE SANDY LOAM.

The Congaree fine sandy loam consists of a dark-brown or yellowish-brown fine sandy loam, underlain at 8 to 12 inches by fine sandy loam to silty clay loam of a yellowish-brown or mottled reddish and

yellowish color. This in turn is underlain by fine sand, sand, and gravel. There is considerable variation in the color and texture of the type from the surface downward, as would be expected in an alluvial soil, where the character of deposition varies with the successive floods.

This type occupies the first bottoms of the rivers, creeks, and branches. It is strictly alluvial in origin and represents material washed from the various soils of the drainage basins of the several streams. The soil is generally lighter in texture and the underlying coarse material comes nearer the surface as the stream channels are approached. In places along the banks of the Tallapoosa River narrow strips of gray or yellow fine sand were included with the Congaree fine sandy loam, as the areas were too limited to show on the map. The largest and most continuous areas occur on the south side of the Little Tallapoosa River north of Kaylor.

The Congaree fine sandy loam is used for the production of cotton, corn, and oats. Cotton yields one-third to one-half bale; corn, 15 to 35 bushels, and oats, 20 to 40 bushels per acre. The areas having a fine sand surface are less productive than the rest of the soil and rarely produce more than one-third bale of cotton and from 8 to 15 bushels of corn to the acre. Most of the cultivated area of the type is in corn, the production of cotton being largely confined to the higher lying areas. Cotton is said to rust badly in the level or depressed areas. Applications of kainit would likely diminish the damage from this source.

The soil is easy to work. It warms up early in the spring and crops mature earlier on it than on the Congaree loam. Crops suffer from occasional overflows and cotton has frequently to be replanted, but this soil sheds water much more quickly than the Congaree loam and the delays are not as serious as on the heavier type. Straightening the courses of the streams and laying tile drains would materially improve drainage conditions.

ROCK OUTCROP.

Rock outcrop embraces exposures of granite which occur in the vicinity of Almond and west of Blake Ferry. It represents areas from which the soil mantle has been removed by erosion. A few areas too small to show in color are represented in the map by symbol. These include outcrops of garnetiferous schists in the Louisa loam area and local exposures of granite in the Cecil and the Durham series. Rock outcrop has no agricultural value.

MEADOW.

The type mapped as Meadow comprises poorly drained bottom land along a number of streams. In these there is a wide range in

the character of the soils, particularly in texture. With the establishment of good drainage this mixed bottom land could be profitably used for corn, oats, forage, cotton, and cane.

SUMMARY.

Randolph County is situated in the southern extension of the Piedmont Plateau, in east-central Alabama, and has an area of 583 square miles, or 373,120 acres. The surface varies from low, rolling ridges to roughly rolling or hilly to mountainous country. Elevations range from 550 to 1,550 feet above sea level.

The county lies within the watersheds of the Tallapoosa and Chattahoochee Rivers, the former receiving most of the drainage.

The county is well supplied with roads and has telephone and rural free delivery service.

The population of the county, 1910, is 24,659, there being very few foreigners in the county. The county is most thickly settled in the southern and eastern parts.

The climate is quite temperate and salubrious. The annual mean precipitation, 49.1 inches, is well distributed throughout the year. The growing season averages about 201 days, which is ample for the production of a great variety of crops.

Cotton, corn, wheat, oats, cowpeas, sweet potatoes, ribbon cane, Irish potatoes, rye, and barley, named in the order of acreage, are the principal crops.

Sixteen soil types, exclusive of Rock outcrop and Meadow, are found in the county. Thirteen of these are grouped in five upland soil series, viz, the Louisa, Cecil, Durham, Iredell, and York. The first-named series covers nearly three-fourths of the area of the county.

The Louisa slate loam is the most extensive type in the county, but only a small proportion of it is under cultivation. It is generally too rough for the economic production of cultivated crops and should be largely used as pasture land. It is valued at $5 to $15 an acre.

Next in point of extent is the Louisa fine sandy loam. It is used for cotton and corn, though well adapted naturally to truck crops, especially sweet and Irish potatoes. Land of this type may be bought for $5 to $40 an acre.

The Louisa clay loam has a fairly general distribution throughout the county, occurring in a deep and a shallow phase. It is subject to excessive erosion. This type is well adapted to the production of forage crops and the steeper areas should be largely used for this purpose, and as pastures.

The Louisa loam is an extensive soil found in nearly all parts of the county. As in case of the Louisa slate loam, little of the loam is under cultivation. At first productive, the fields decline rapidly

with careless methods. Rougher areas of the type are best used for pasture; better situated areas give good yields of corn, cotton, wheat, and oats. Land of this type is valued at $5 to $15 an acre.

Nearly all of the Cecil sandy loam is under cultivation to corn, cotton, oats, and forage. It is well adapted to truck crops, but under present conditions these crops could probably not be grown profitably. The land can be bought for $20 to $40 an acre.

The Cecil clay loam, including its important heavy phase, is a valuable general farming soil. Typical areas are held at $10 to $35 and the phase at $20 to $100 an acre.

The Cecil fine sandy loam, owing to its rolling and eroded surface, is a soil of low productiveness. It has a relatively small extent and it is used for the ordinary staple crops. Farms on this type may be purchased for $10 to $25 an acre.

Of the two Durham soils the sandy loam is the more extensive; the fine sandy loam the better type for the staples of the region. Only about 10 square miles of these soils exist. Prices range from $5 to $40 an acre. The remaining upland types are of small extent. Two of them are very strong soils.

Of the alluvial soils the Congaree loam, covering 21,184 acres, is the most extensive. The fine sandy loam is also a relatively extensive type. These soils are fertile and of especial value for the production of corn and grass crops. A considerable part of these bottom lands is still uncleared.

Nearly all the soils of the county can be greatly improved by adopting methods of crop rotation, deeper plowing, and green manuring.

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