SOIL SURVEY OF ROWAN COUNTY, NORTH CAROLINA.

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DESCRIPTION OF THE AREA.

Rowan County, North Carolina, is situated in the west-central part of the State. It is bounded on the north and east by the South Yadkin and Yadkin Rivers, which separate it from Davie and Davidson Counties, on the south by Stanly and Cabarrus Counties, and on the west by Iredell County. In shape the county is approximately a right-angled triangle, with a base of about 31 miles and an altitude of 25 miles. It has an area of 516 square miles, or 330,240 acres.

The surface configuration of Rowan County is prevailingly rolling, ranging from gently rolling to hilly, with a few high hills locally called "mountains." Youngs Mountain, which has an elevation of 1,092 feet above sea level, is probably the highest of these. Among the largest of the others are Flat Swamp, Dunns, and Reids Mountains. The slopes of these hills are too steep for cultivation, and they are utilized only for quarrying, forestry, or pasturage. Steep and precipitous slopes occur also along nearly all the larger streams of the county, particularly in the northwestern corner and paralleling the South Yadkin and Yadkin Rivers from the Iredell County line to the Stanly County line. With the exception of the high hills, all the interstream country has an undulating to gently rolling and rolling surface. Bordering the streams are narrow strips having a nearly flat surface, with only a gentle slope toward the stream and in the direction of the flow.

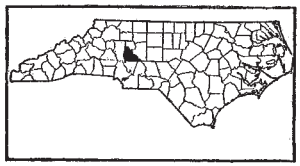

FIG. 6.—Sketch map showing location of the Rowan County area, North Carolina.

The county is traversed by a drainage divide which crosses the Cabarrus-Rowan County line near Gold Hill and follows in a general way the county highway by China Grove and Landis to Prospect Church, where it passes into Iredell County. North of this watershed the larger streams flow northeast into the South Yadkin and Yadkin Rivers. The general slope of the greater part of the county is toward the northeast. South of the drainage divide the streams flow south, but their course in Rowan County is short.

The most important streams draining the county and entering the South Yadkin and Yadkin Rivers are Panther, South Second, Crane, Grants, North Second, Third, and Fourth Creeks. The South Yadkin and Yadkin Rivers are swiftly flowing streams, but their largest tributaries in Rowan County have apparently worn down nearly to base level, so that their movement is slow. During freshets in the rivers, backwater stands in the creeks and over their flood plains, in some instances covering an area of several square miles. An attempt is being made to reclaim the lowlands along a number of the creeks by dredging. In some of the swifter streams dams have been built and the water power used for running grist mills.

Rowan County was first settled in about 1720, mainly by Protestants from Moravia fleeing from religious persecution, and by Scotch-Irish. These settlers were industrious and thrifty. The present population of the county consists mainly of the descendants of the original settlers. A large proportion of the urban population consists of negroes. A few Italians, Greeks, and Syrians are found in the towns and employed upon the public works. The population of the county is reported in the 1910 census as 37,521, an average of about 70 to the square mile.

Salisbury, the county seat, with a population of 7,153, is the largest town. It is located near the center of the county, on the main line of the Southern Railway, and is one of the most important railroad centers in North Carolina. Spencer is the second largest town in the county. Its population is reported as 1,915 in the 1910 census. It is situated 2 miles northeast of Salisbury. The locomotive repair shops of the Southern Railway are located here. East Spencer in 1910 had a population of 1,729. China Grove, Landis, and Rockwell are important cotton manufacturing centers. Cleveland, 14 miles northwest of Salisbury, on the Southern Railway, has a number of manufacturing enterprises, and is the trading point for a prosperous agricultural section. At Granite Quarry the stone-quarrying industry is important, and Gold Hill is a mining village of local prominence.

The transportation facilities of Rowan County are better than the average for North Carolina counties. The double-tracked line of the Southern Railway between Charlotte and Greensboro crosses Rowan County in a northeast-southwest direction, affording access to the large northern and southern markets. The Western North Carolina Railroad, now a part of the Southern Railway system, affords transportation to western points. The northwestern part of the county is provided with good transportation facilities by the Mocksville-Mooresville Branch of the Southern Railway, and the southwestern part is crossed by the Norwood Branch of the same system.

Practically all the agricultural product of Rowan County is consumed locally. Salisbury and China Grove are good cotton markets, and this staple is imported from outside points in large quantities to be manufactured at these places.

Dairy and poultry products and truck crops find a ready market at Salisbury and Spencer, and wheat and corn are sold at local mills or are ground for home use.

The public highways of Rowan County are, as a rule, in good condition. Macadam and sand-clay roads branch out from Salisbury in every direction, and similar roads are being built in the more remote sections of the county.

CLIMATE.

The data following, showing the normal monthly, seasonal, and annual temperature and precipitation for Rowan County, are compiled from the records of the Weather Bureau station at Salisbury. The annual precipitation ranges from 35.57 inches for the driest year to 59.43 inches for the wettest year, with a mean of 47.61 inches. The rainfall is well distributed throughout the year. The heaviest precipitation occurs during the spring and summer months, and is ordinarily sufficient for the growing crops. In certain sections of the county, however, the rainfall during the last four years has been lighter than normal, causing partial failures, and in some cases almost total failures, of the crops.

The temperature for the county ranges from 102° F., the highest recorded, to −1° F., the lowest, with an annual mean of 59.9° F. The temperatures during spring and fall are ideal for farm work. The summer temperatures are rarely excessive, and the winters are not extremely cold.

The average date of the last killing frost in the spring is April 9, and of the first killing frost in the fall October 21. There is an average growing season of 195 days, which is sufficient for maturing all the crops commonly grown in this section. The date of the earliest killing frost recorded in the fall is October 3, and of the latest in the spring May 15.

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

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	°F.	°F.	°F.	Inches.	Inches.	Inches.
December	42.4	75	6	3.75	1.92	4.53
January	41.0	79	6	3.46	1.86	5.09
February	41.8	75	−1	4.25	.93	6.02
Winter	41.7			11.46	4.71	15.64
March	51.1	92	16	4.56	5.57	3.93
April	59.7	94	20	3.29	2.82	3.20
May	69.1	100	30	4.28	2.46	3.20
Spring	60.0			12.13	10.85	10.33
June	75.7	101	41	4.57	2.08	2.25
July	79.0	102	54	5.04	3.96	7.63
August	77.5	102	45	5.33	7.07	9.65
Summer	77.4			14.94	13.11	19.53
September	71.7	100	41	3.20	.94	5.13
October	59.3	94	23	3.25	2.60	6.83
November	50.5	85	12	2.63	3.36	1.97
Fall	60.5			9.08	6.90	13.93
Year	59.9	102	−1	47.61	35.57	59.43

AGRICULTURE.

The lowlands along the South Yadkin and Yadkin Rivers were the first to be taken up by the early settlers in Rowan County. The first crops grown were mainly corn, oats, and barley, with some tobacco for home use. Wheat was not grown at first. Whisky and brandy were manufactured and hauled to market. The barley was used in malting. Beans, potatoes, pumpkins, and tomatoes were grown for home use. Live stock was introduced by the settlers, though fish and game were important in supplying meat. At one time the lowlands along many of the streams supported a luxuriant growth of reeds and grasses valuable for feeding cattle. At a later period hogs were brought in on foot from other States. Sheep were raised at first only to a small extent, because of the presence of wolves. Flax was grown, and was spun and woven at home. Later cotton was grown, but, before the nineteenth century, almost exclusively for home use.

Philadelphia furnished the first market. Some of the pioneers drove beef cattle to that city and brought back iron for making agricultural implements, together with other necessities.

By the latter part of the eighteenth century Fayetteville, N. C., had become an important market, and from this time until about 1850 or 1860 it continued the principal market for Rowan County. Cattle, hides, leather, tallow, whisky, brandy, and cheese were exchanged at Fayetteville for coffee, sugar, spices, iron, and salt.

Wheat, though not grown at all by the first settlers, had become second in importance only to corn by 1775. It is said the yields of this cereal before the Civil War period were much larger than they were for a period of about 35 years following the war, because the lands were fresher and greater quantities of barnyard manures were used.

When the cotton gin came into general use, cotton began to be grown on a larger scale, and its production has gradually increased up to the present time. Tobacco also became a crop of considerable importance. Prior to 1880 nearly all of the leaf was hauled to market at Winston, and at a later period much of it was marketed at Statesville. About 1880 a number of tobacco factories and warehouses were built in Salisbury to compete with the Winston market, but a large part of the county's output continued to be sold at Winston, with the result that by 1900 the Salisbury factories and warehouses had discontinued operations. An idea of the importance of the tobacco crop in Rowan County from 1880 to 1910 may be had from the Federal census statistics covering this period. In 1880 a total of 216 acres is reported in this crop, with a yield of 115,251 pounds. By 1890 the area devoted to tobacco had increased to 390 acres, and the total yield is given as 187,724 pounds. After this time the production of this crop began to decrease, and in the 1900 census only 130 acres are reported in tobacco, with a yield of 46,770 pounds, and the census of 1910 reports 7 acres in tobacco, with a total yield of 2,353 pounds.

With the decrease in the production of tobacco there was a marked increase in the production of cotton. In 1879, according to the census of 1880, there were 10,645 acres planted to cotton, yielding 4,381 bales. By 1889 the acreage devoted to cotton had increased to 15,228 acres, but the total yield was only 4,270 bales. The difference in the average acreage yield is attributed in part to an unfavorable season in the latter year. The census of 1900 shows a decided increase in both the acreage devoted to cotton and in the acreage yield, there being 18,171 acres in cotton, with a production of 7,116 bales. In 1909, according to the 1910 census, there were 19,779 acres devoted to cotton, and the total yield was 7,959 bales. During the last 10 years a number of cotton mills have been built in Rowan County and in neighboring counties, but these seem to have had little effect on the production of cotton.

Owing to the difference in the soils of the county, there is considerable variation in the character of the crops grown in different local-

ities. The gravelly loams, coarse sandy loams, and, to a less extent, the sandy loams, found chiefly in the south-central and north-central parts of the county, are more desirable for cotton, and it is on these soils that the greater part of the crop is grown. On the heavy clays, clay loams, silty clay loams, and also on some portions of the silt loams cotton makes a good growth and fruits fairly well, but the crop matures slowly and the yield is frequently curtailed by frosts. The coarser textured soils warm up earlier in the spring, and on these cotton makes a quicker growth and matures earlier than on the heavier soils. Another feature unfavorable to the production of cotton on the heavy red soils is the probabililty of mud stains in the lint.

On the other hand, the heavier soils are better suited for the production of grain and hay crops, such as wheat, corn, oats, and clover. For this reason cotton is a crop of minor importance in localities where the heavy soils predominate.

From the first corn has been the most important crop throughout the county as a whole, and it still ranks first among agricultural products. The census of 1880 reports 38,963 acres in corn, giving a total yield of 597,519 bushels, or an average of about 15⅓ bushels per acre. In 1900 a total of 41,191 acres is reported, with a yield of 583,660 bushels. By 1909 the total area in corn had been reduced to 36,428 acres, giving a yield of 553,491 bushels. The average yield is about 15⅕ bushels per acre.

Wheat ranks next to corn in importance. The 1880 census reports 24,195 acres in this crop, with a yield of 138,278 bushels. From 1879 until about 1895 the acreage seeded to wheat remained practically stationary, but the census of 1900 reports an increase to 30,351 acres, which gave a yield of 229,000 bushels. The total acreage in wheat in 1909 was 23,197, with a yield of 175,387 bushels. Since 1890 there has been a decided decrease in the production of oats. The acreage in 1909 was 9,910 acres and the production 131,260 bushels. Considerable rye is grown in the county, but mainly as a winter cover crop. Only 201 acres were harvested in 1909, with a production of 1,287 bushels.

Cowpeas are mostly grown as a green manuring crop, though some are gathered for seed. Peanuts are grown in patches near the houses for home use and to a small extent for local markets.

Tame and cultivated grasses have been of considerable importance for many years, and the acreage devoted to them is steadily increasing. Considerable grain is cut green and used for feeding.

Irish potatoes are grown in small patches, both for home use and for local market. Sweet potatoes are grown to about the same extent, and they, too, are consumed at home or disposed of at the local markets. Garden vegetables, including cabbage, beans, garden

peas, beets, turnips, sweet corn, and onions, are grown mainly for home use. They find a ready market within the county during the summer months. Sorghum is grown and either made into sirup for home use or cut green and used in feeding hogs and cattle.

Orchard fruits, including apples, peaches, and pears, do well in most sections of the county. Most of the fruit is consumed at home, though some is sold in Salisbury and the smaller towns. Fruit is not produced in sufficient quantities to supply home demands, and large quantities are shipped in from other sections. Some grapes are grown.

Dairying is practiced extensively in the vicinity of Salisbury and Spencer, and the products are sold at these markets. Milch cows are kept on most of the farms to supply milk and butter for home use. In the southwestern part of the county a number of farmers ship cream to a creamery at Newton. Some beef cattle are raised, but not enough to supply the demands of the county. Within recent years a few farmers have introduced improved breeds of cattle, and cattle raising is apparently receiving increased attention.

A few hogs are raised on nearly every farm, but bacon, pork, and lard are shipped in in large quantities both for the use of farmers and for sale in the towns. Sheep and goats are kept on some farms. A few farmers raise their own work stock.

The most notable changes in agricultural methods began with the introduction of improved farm machinery. Prior to this wheat and oats were sown on the surface of unbroken land and turned under with a "dixie" or bull-tongue plow. In some instances a brush harrow was run over the surface, but frequently it was left rough. Corn land was sometimes broken broadcast to a depth of 2 or 3 inches, but generally the preparation of the seed bed received very little attention. The first large plows were used about 1880, and with their introduction deep breaking of the land and more thorough preparation of the seed bed began. The two and three horse steel-beam plows were introduced about 30 years ago, and these were soon followed by disk and cutaway harrows. Disk plows have been in use for about 15 years. Grain drills and binders have been used in the county for about 25 years, and mowing machines for about 35 years. Corn planters and clover seeders have been used for about 5 years. During the last 5 years steam and gasoline plows have been introduced.

At present the best farmers break wheat land in June, July, or August with a two, three, or four horse plow to a depth of 6 to 12 inches and then harrow it. In September or October it is again broken and worked with a disk or cutaway harrow until a mellow seed bed is formed. Stable manure is applied just before the last breaking or sometimes just before the last harrowing. The wheat

is then seeded with a drill, usually between October 10 and November 15. The fertilizer is distributed through the wheat drill with the wheat. The quantity and composition of the fertilizers vary with different planters, but in most cases from 150 to 250 pounds per acre of an 8–2–2, 8–3–3, or a 10–4 mixture is used. If wheat follows corn, the land is not broken earlier than September 1, and usually it is broken only once. The yields resulting from these methods range from 8 to 45 bushels per acre, the maximum being rare. Under the old methods a yield of 10 bushels per acre was about all that could be expected. The new methods are not in general use, but they are rapidly becoming more popular. The changes that are taking place in the production of corn, cotton, and other crops are equally as marked as in the case of wheat.

Cultural methods vary widely with different farmers. In the cultivation of cotton and corn a three to five plow one-horse cultivator is generally employed, and 2-horse riding cultivators are used by many of the best farmers. Hand hoes are used for reducing cotton to a stand and for removing grass and weeds between the plants. At the last cultivation of both cotton and corn the surface is left flat or nearly so. In the cultivation of potatoes sweeps are commonly employed.

The value of systematic crop rotation is not generally recognized. Nearly every farmer so arranges his crops that corn and wheat follow clover, but three, four, and five year rotations are practiced in only a few cases. One rotation which has proved particularly satisfactory is: First year, cotton with crimson clover in September; second year, corn with peas (one row of peas and two rows of corn, or peas sown broadcast in corn at the last cultivation); third year, wheat with red clover about March 25, the clover being dragged in with a harrow. This rotation is especially effective where an attempt is made to grow cotton on the Cecil clay and Cecil clay loam soils.

Fertilizers are used to a greater or less extent throughout the county, though the relation of soils to fertilizers receives very little attention. It is generally recognized that potash prevents the "frenching" of corn and the "rusting" of cotton on the Iredell soils, and liberal applications of kainit are made. In general, fertilizers analyzing 8–2–2, 8–1–3, 8–3–3, and 10–4, 10–2, and 9–3–3 are applied at the rate of 100 to 250 pounds per acre, almost irrespective of soils or crops. In a few instances the farmers buy the ingredients and make home mixtures which analyze about 8–2–2 or 8–3–3 or 10 per cent phosphoric acid and 4 per cent potash. With cotton an acreage application of 200 pounds of an 8–4–4 mixture is sometimes used. About 200 pounds per acre of 16 per cent phosphoric acid is frequently used with cotton, corn, and wheat, where followed by a winter cover crop. The North Carolina Department of Agriculture has found

that on the Cecil clay and clay loam an acreage application of 400 pounds of a 10–2–2 fertilizer, drilled in before planting, is the best fertilizer for cotton. The 1910 census reports an expenditure of $93,887 for fertilizers in Rowan County in 1909.

Farm labor is somewhat scarce in the county. The laborers are both white and colored. Where hired by the month they receive $12 to $20 per month, or an average of about $15 per month, with board. When hired by the day plowmen receive 75 cents per day and board, while women receive 75 cents per day and board for chopping cotton. Helpers around thrashing machines receive $1 per day. From 50 to 65 cents per 100 pounds is paid for picking cotton. In 1909, according to the census of 1910, a total of $68,324 was expended for labor in Rowan County.

About 62 per cent of the farms are operated by the owners, the remainder in practically all cases by tenants, who rent either for cash or under different share systems. Under the share system the most common practice is for the owner to furnish the house, stock, fertilizer, and implements, receiving two-thirds of all crops produced. Under this arrangement the tenant performs all labor. In some instances the landowner furnishes only the land and tenant house, and receives one-third of the crops.

The farms vary in size from 40 to 300 or even 400 acres. A few holdings in the county comprise as much as 1,800 or 2,000 acres, but not all of these larger tracts are in improved farms. The average size of farms is reported in the 1910 census as 89.2 acres. About one-half of the land in farms is improved.

Farm lands vary widely in value in different localities. In general, the price paid for farm land ranges from $20 to $125 an acre, averaging probably about $45 an acre.

SOILS.

Rowan County lies wholly within the Piedmont Plateau, and the upland soils are all derived, through weathering, from the various rock formations occurring within its limits. The rocks of these formations are widely variable in physical and chemical composition, and the products resulting from their disintegration and decay are unlike in character, so that there is considerable variation in the resulting soils.

The southeastern part of the county, or that section lying between Reedy Creek and the Yadkin River, is underlain by a rock formation known as the "Carolina Slate Belt" or the "Carolina Metamorphic Slate and Volcanic Belt."[1] There are included in this rock belt laminated slates and some massive rocks without slaty structure.

[1] See physiographic map of North Carolina and descriptive matter, pp. 54–57, Bulletin No. 2, N. C. Geol. Survey. See also ch. 3, Bulletin No. 21, N. C. Geol. Survey.

The slates proper vary in color from light gray to greenish gray, and in texture from very fine grained to moderately coarse grained rocks.

The more massive slates are in some instances nearly the same in color as the true slates, but more often they are slightly darker, and fresh fractures show, in some places, red or brownish specks due probably to the oxidation of iron compounds. These more massive slates are extremely hard and brittle, and very resistant to weathering. There are derived from the slates two distinct soil series, the Georgeville and the Alamance.

Lying to the west of the slate belt and covering practically all of the remainder of the county is a region of crystalline rocks, both acidic and basic in character, including granites, gneiss, diorite, gabbro, and gabbro-diorite. There is a wide variation in the physical and chemical properties of these crystalline rocks. Near Granite Quarry and for a distance of 5 or 6 miles southwest of this point the underlying rock is a medium to coarsely crystalline granite, consisting chiefly of quartz, feldspar, hornblende, and biotite or muscovite. As a general rule this granite is weathered only to shallow depths, and it frequently outcrops.

In the vicinity of Landis the granite differs from the Granite Quarry formation in that it is more coarsely crystalline, appears to carry a higher percentage of iron-bearing minerals, and, as a whole, is more schistose. In some sections of the county there are areas of considerable extent underlain by a binary granite varying in texture from fine to medium coarse. This rock carries little if any iron-bearing mineral, and is composed chiefly of quartz and feldspar. The more important of these binary granite areas occur 3 miles southeast of China Grove, 4 miles east of Salisbury, 3 miles north of Gold Hill, near Woodleaf, and near Poole School. The depth of weathering in these areas as a whole is comparatively shallow, and rock outcrops are common.

In the northern part of the county, particularly near Gays Chapel and 3 miles southeast of Cooleemee Bridge, the soil-forming rock is a porphyritic granite, the phenocrysts being large crystals, chiefly orthoclase feldspar. In road cuts as well as in excavations throughout the north-central part of the county these crystals are conspicuous, and may be seen in all stages of decomposition. It is believed that a large part of the soil in this section of the county is derived from this porphyritic granite, but this can not be stated definitely for the reason that in many places the material is weathered to great depths.

The soil in large areas in the vicinity of Mill Bridge, Bear Poplar, Mount Ulla, Third Creek Church, and about 6 miles west of Salisbury appears to be derived mainly from medium to fine grained granites and gneisses, deeply weathered and seldom outcropping.

Occurring within the granite formations of the county are areas of basic rock, mainly diorite and gabbro-diorite, varying in size

from a fraction of a square mile to 5 or 6 square miles. The gabbro-diorite and some areas of the diorite occur as dikes cutting the granites. In some instances rather fine-grained granitic rocks are interbedded with the diorite or occur in close association with it, and these give rise to the quartz sand contained in the Iredell fine sandy loam. The diorites in weathering form an extremely plastic, sticky, and impervious clay which protects the underlying rock from further disintegration. For this reason the Iredell soils rarely ever extend to a depth of more than 24 or 30 inches.

In the weathering of the granites and gneisses the quartz remains on the surface and throughout the soil section in the form of sand and larger fragments, and in some instances the feldspar also, though as a rule the latter decomposes, forming a tough, brittle clay.

Where the granites and gneisses contain iron they give rise to the red color in the subsoils, which determines the types of the Cecil and Appling series. If the iron-bearing minerals are absent or present only in small quantities in the rocks, they give rise to the Durham soils, which have a yellowish subsoil. By far the greater part of the Durham material is derived from binary granites.

The Appling gravelly loam is derived from the coarsely crystalline granite occurring in the vicinity of Granite Quarry and southwest of this point. This formation also gives rise to the greater part of the Rock outcrop mapped in this county. The Cecil gravelly loam and coarse sandy loam owe their origin mainly to the coarse-grained schistose granite occurring in the vicinity of Landis and, to a less extent, to the porphyritic granite in the northern part of the county. The fine-grained granites and gneisses occurring around Mill Bridge and similar formations found elsewhere give rise to the greater part of the Cecil sandy loam, fine sandy loam, clay loam, and clay, and to the Appling sandy loam.

From the dioritic rocks there are derived the Iredell and Mecklenburg series.

While differences in the textures of all the crystalline rocks and in the depth of weathering have given rise to soils varying in texture, further differences have been brought about by erosion, which has especially influenced the depth of the sandy material overlying the clay subsoils. For example, in a number of areas occurring along slopes the surface mantle of sandy material has been removed by surface wash, accentuated by imprudent methods of cultivation, in such a way as to expose the subsoil, giving rise to patches of clay and clay loam. On the other hand it appears that some areas of the sandy loams represent former areas of heavy materials from the surface of which the fine clay and silt material has been removed, leaving the coarser sand grains.

Occurring along stream courses in all sections of the county are narrow strips of alluvial soils which are composed of materials washed

from the surrounding hills and, to a less extent, from the Appalachian Mountains, and deposited by the streams along their courses.

The alluvial soil occupying second-terrace positions is classed with the Wickham series. The first-bottom soils include two series, the Wehadkee and the Congaree, and also Meadow (Congaree material).

The several series of soils encountered in Rowan County differ not only in physical characteristics but also in agricultural value, crop adaptation, susceptibility to improvement, requisite cultural methods, and usually in manurial requirements. These differences are brought out in the detailed description of the various soil types in the following pages, while the distribution of the various soil types is shown on the accompanying map.

In the following table the soils of the county are grouped according to origin and important physical characteristics:

Soils derived in place from weathered products of underlying rocks.	Mainly from fine-grained bluish slates.	Gray to red soils, red silty clay subsoils.	Georgeville stony loam.
			Georgeville gravelly silt loam.
			Georgeville silt loam.
			Georgeville silty clay loam.
		Gray soils, yellow silty clay subsoils.	Alamance gravelly silt loam.
			Alamance silt loam.
	Mainly from fine to coarse crystalline and porphyritic granite, together with gneiss; gray to red soils, red clay subsoils.		Cecil gravelly loam.
			Cecil coarse sandy loam.
			Cecil sandy loam.
			Cecil fine sandy loam.
			Cecil clay loam.
			Cecil clay.
	Mainly from medium to coarse-grained granite; gray soils, pale-red or yellowish-red subsoils.		Appling gravelly loam.
			Appling sandy loam.
			Rock outcrop.
	Mainly from highly siliceous binary granite; gray soils, yellow sandy clay subsoils.		Durham coarse sandy loam.
			Durham sandy loam.
	Mainly from dioritic rocks; dark-gray to brown soils, yellowish to brown plastic clay subsoils.		Iredell stony loam.
			Iredell fine sandy loam.
			Iredell loam.
	Mainly from dioritic rocks; reddish soil, reddish-brown plastic clay subsoil.		Mecklenburg clay loam.
Alluvial soils; subject to overflow.	Brown soil, light-red subsoil; found on second terraces.		Wickham fine sandy loam.
	Brownish soils, yellowish to chocolate-brown subsoils; found on first bottoms.		Congaree fine sand.
			Congaree fine sandy loam.
			Congaree silt loam.
	Gray soil, gray mottled subsoil; found on first bottoms.		Wehadkee silt loam.
Alluvial and colluvial material; undifferentiated; subject to overflow.	Meadow (Congaree material).		

Below are given the names and the actual and relative extent of the various soils mapped in the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay loam	78,592	23.8	Georgeville silt loam	6,208	1.9
Iredell fine sandy loam	46,848	14.2	Durham coarse sandy loam	4,928	1.5
Cecil clay	32,896	10.0	Durham sandy loam	3,968	1.2
Cecil sandy loam	31,360	9.5	Appling sandy loam	2,240	.7
Cecil gravelly loam	20,480	6.2	Iredell loam	2,240	.7
Congaree silt loam	20,288	6.1	Mecklenburg clay loam	1,792	.5
Meadow (Congaree material)	12,864	3.9	Georgeville stony loam	1,152	.3
Cecil coarse sandy loam	9,792	2.9	Congaree fine sandy loam	896	.3
Alamance gravelly silt loam	9,280	2.8	Wehadkee silt loam	896	.3
Appling gravelly loam	9,088	2.8	Wickham fine sandy loam	704	.2
Georgeville silty clay loam	8,384	2.5	Iredell stony loam	640	.2
Cecil fine sandy loam	8,064	2.4	Congaree fine sand	576	.2
Alamance silt loam	7,808	2.4	Rock outcrop	512	.2
Georgeville gravelly silt loam	7,744	2.3	Total	330,240	.....

Cecil Series.

The Cecil series includes some of the most important and widely distributed soils of the Piedmont Plateau. The heavier members are known as the "red-clay lands." These soils are characterized by their red clay subsoils and gray to red soils ranging in texture from sand to clay, the lighter colors prevailing in the sandy members. A characteristic of the subsoil is the content of sharp quartz sand and the frequent occurrence of veins of quartz. Mica flakes are also usually present in the subsoil. The soils are of residual origin and derived principally from granite and gneiss, weathered to great depths, so that rock outcrops are rare. Fragments and bowlders of the parent rock are, however, found in places on the surface. The topography is rolling to hilly, with level to undulating areas in situations where stream erosion has not been particularly active. Six types of the Cecil series—the gravelly loam, coarse sandy loam, sandy loam, fine sandy loam, clay loam, and clay—are encountered in Rowan County. The Cecil soils cover more than half the entire county.

Cecil gravelly loam.

The surface soil of the Cecil gravelly loam to a depth of 8 to 12 inches consists of a gray to yellowish-gray medium to fine sandy loam, containing 30 to 50 per cent of fine quartz gravel and coarse sand. Between the soil and subsoil there is frequently a 4 to 6 inch stratum of material similar in every respect to the surface soil, except

that it has a yellowish-red or salmon-red color. The subsoil is a light-red to red, stiff, friable clay, carrying a small percentage of angular quartz gravel and, in some instances, a large quantity of minute mica flakes. The disintegrated parent rock is usually encountered at a depth of about 30 inches. In some areas of this soil, particularly in the northern part of the county, the quartz gravel is absent, but there is scattered over the surface and mixed with the soil a large quantity of cubical crystals, apparently feldspathic in character. In road cuts these may be seen in all stages of decomposition. Throughout the type there occur small areas of Cecil clay and clay loam, and, in a few instances, the outcrop of quartz veins gives rise to knolls and ridges of small extent. Bowlders of the parent rock are of common occurrence throughout the type.

The Cecil gravelly loam is the predominating soil in the southwestern corner of the county, and it is found to a greater or less extent throughout the county, except in the slate belt. It has its most typical development near Concordia Church and in the vicinity of Landis.

The topography of this type is varied. In the southwestern part of the county the surface is gently rolling to rolling, becoming more rolling near the streams, while in the northern part of the county a large part of the type is steep and hilly. Owing to its surface configuration and loose, porous structure, this soil is well drained.

The forest growth on the Cecil gravelly loam consists of oak, shortleaf pine, hickory, and dogwood, with some sourwood, cedar, and persimmon. Probably one-third of the type is forested, and it supports some of the best pine timber in the county.

This soil is well suited to the production of cotton, corn, oats, sorghum, cowpeas, soy beans, and peanuts. On account of its loose, porous structure and good drainage, it warms up early in the spring and crops can be planted earlier than on the heavier members of the Cecil series. For this reason cotton has a longer growing season and matures more fully than it does on the heavier soils. With an acreage application of 150 to 250 pounds of an 8–2–2, 8–3–3, 9–3–3, 10–2.5–4, or 10–4 fertilizer, cotton yields one-third to 1 bale per acre, corn 15 to 35 bushels, and wheat 8 to 15 bushels. The 10–4 fertilizer is not used as a rule except for wheat. Sorghum gives good results, and the quality of the sirup is excellent, though this crop is grown only for home use. Apples, peaches, and all garden vegetables common to this section of the State do well.

Usually the Cecil gravelly loam is deficient in humus and is greatly benefited by turning under green manuring crops and by adding barnyard manure. A rotation of crops including the legumes is especially helpful.

The value of this land ranges from $40 to $60 an acre.

CECIL COARSE SANDY LOAM.

The surface soil of the Cecil coarse sandy loam in its typical development consists of 6 to 8 inches of a gray or yellowish-gray coarse sandy loam, grading into a reddish-yellow coarse sandy loam, which extends to a depth of 12 to 14 inches. This is underlain by a red clay subsoil which is in some places quite friable, owing to the presence of coarse sand particles. Locally the surface of this type is brownish red in color and carries a rather large quantity of clay and very fine sand. In other places quartz gravel and white quartz fragments are scattered over the surface. Frequently the subsoil of this type passes into the disintegrated parent rock at depths of 20 to 30 inches, and in a few instances the rock outcrops.

In distribution the Cecil coarse sandy loam is confined to no particular section of the county, though it is not developed in the southeastern corner or in the northwestern part. The most important areas occur northeast of Spencer, near Granite Quarry, along South Second Creek, north and west of Five Points, and in the southwestern part of the county along the Cabarrus County line. Smaller areas of the type are scattered over the central and south-central sections of the county.

The surface of the Cecil coarse sandy loam varies from nearly level to rolling and hilly. The smoothest portions of the type lie along drainage divides in the southern and southwestern parts of the county. Owing to the topography and the loose, porous soil and friable subsoil, the surface drainage and internal drainage are good.

Nearly all of the merchantable timber has been removed from this type, though a small proportion of it supports a growth of oak, hickory, and shortleaf pine, with some dogwood.

This is considered an excellent soil for cotton, corn, soy beans, cowpeas, peaches, pears, grapes, sweet potatoes, Irish potatoes, and garden vegetables. Sorghum, peanuts, and melons do well, but are grown only for home use. It is a fair soil for wheat and oats, though on account of its coarse texture and porous structure these crops are likely to suffer from lack of moisture in dry seasons. The principal crops grown are cotton, corn, soy beans, and cowpeas. Cotton yields range from one-third to 1 bale, and corn from 15 to 35 bushels per acre.

Fertilizer practices on this type do not differ materially from those on the other sandy loams of the Cecil series. In general, cotton, wheat, and oats are given an acreage application of 100 to 250 pounds of an 8–2–2, 8–3–3, or a 10–4 mixture. Corn usually follows a leguminous crop, and is not fertilized.

This soil, like its associated types, is low in humus. The hillside fields are sometimes planted in winter cover crops to good advantage,

or, if badly eroded, reforested or used for pasturage. The Cecil coarse sandy loam is valued at $30 to $60 an acre.

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

Mechanical analyses of Cecil coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
233445	Soil	9.0	13.7	7.0	23.0	18.1	23.4	5.6
233446	Subsoil	3.7	6.8	3.2	9.2	6.9	19.2	51.1

CECIL SANDY LOAM.

The surface soil of the Cecil sandy loam consists of a gray sandy loam or loamy sand, passing into a reddish-yellow sandy loam at a depth of 6 to 8 inches. This, in turn, grades into a red, friable, stiff clay subsoil at a depth of 10 to 15 inches. In some localities the type consists of a brownish-gray sandy loam, underlain at a depth of 6 to 8 inches by a friable red clay. In nearly all instances finely divided mica is present in the lower part of the subsoil. Where this type occupies positions conducive to erosion the surface mantle has been wholly or partly removed, giving rise to spots of Cecil clay or Cecil clay loam, locally called "gall spots." Inextensive areas throughout this type are covered with quartz fragments resulting from the breaking down of quartz veins.

In occurrence the Cecil sandy loam is closely associated with the gravelly and other sandy members of the series, though it is most extensively developed in the vicinity of Franklin and north to the South Yadkin River. Within a radius of about 4 miles of Franklin it occupies about one-half the total soil area. It is typically developed in small bodies throughout the southern and southwestern parts of the county. A typical area occurs near Woodleaf.

The topography of the Cecil sandy loam is as variable as that of any soil type in the county. It extends from the lowlands along the streams to the crests of hills and broad watersheds, though it is not encountered on any of the low "mountains." The smoothest areas of the type are those which occupy the crests of broad interstream areas. As a result of its prevailingly rolling surface and moderately open texture the drainage is good.

Nearly all the Cecil sandy loam is under cultivation, though a part of it is forested with shortleaf pine, oak, hickory, and maple, with some sourwood, locust, persimmon, dogwood, and cedar.

The Cecil sandy loam is well suited to the production of cotton, corn, wheat, oats, rye, sweet potatoes, sorghum, and garden vegeta-

bles, including cabbage, beans, beets, tomatoes, sweet corn, garden peas, radishes, onions, and turnips. The principal crops grown are corn, cotton, wheat, and oats. In addition to these, nearly every farmer in the vicinity of the larger towns has a small patch devoted to truck crops for the local markets and for home use.

Corn yields range from 15 to 40 bushels per acre, and in a few instances, with careful management and heavy fertilization, as much as 60 or 70 bushels has been obtained. Cotton on this type produces one-half to 1 bale per acre, oats from 18 to 45 bushels, and wheat 10 to 25 bushels.

The most general fertilizer practice on this type consists of an acreage application of 200 pounds of an 8–2–2 mixture for corn, cotton, and wheat. A few farmers sow winter cover crops, and where this is done, the following crop usually receives about 200 pounds per acre of 16 per cent phosphoric acid. Where available barnyard manure is used with truck crops. In some instances an 8–3–3 or a 10–4 instead of an 8–2–2 mixture is used with corn, cotton, and wheat.

The large yields of corn and wheat obtained by the better farmers testify to the capability of this soil when properly prepared, manured, and fertilized. The type is easily improved, and the improvement made is quite lasting on account of the retentive nature of the red clay subsoil. One of the greatest deficiencies of this soil is the low content of humus. This is usually remedied on well-managed farms by growing cowpeas, crimson clover, vetch or soy beans, and by applying stable manure where available. A systematic rotation of crops, including cowpeas and other legumes, is also employed effectively in building up the soil to a high state of productiveness.

The value of this land ranges from $40 to $70 an acre, depending on location with respect to good roads and markets.

CECIL FINE SANDY LOAM.

The surface soil of the Cecil fine sandy loam consists of a gray or yellowish-gray fine sandy loam, grading into a pale-red fine sandy loam at a depth of about 6 to 8 inches. The subsoil, which is usually encountered at a depth of 10 to 12 inches, is a red, friable fine sandy clay, frequently carrying a large quantity of fine mica flakes at lower depths. In some instances the subsoil is a red, tough clay, practically free from sand. Variations in the color of the surface soil are numerous. In many places over small areas it is brownish gray, while other spots have a pale-red or brownish-red color. In some spots the soil contains an appreciable percentage of clay, and is therefore heavier than the average of the type. Included with this type are small areas of Cecil clay and of Cecil clay loam, too inextensive to be shown separately on the soil map.

The Cecil fine sandy loam has a rather small total area in Rowan County. The largest bodies occur 2 miles north of Barber, along Third Creek, near Pittsburgh Church, around Knox Chapel, and about 1 mile northeast of China Grove. Other areas of importance are encountered 2 miles south of Cleveland.

The surface of the Cecil fine sandy loam is undulating to rolling, becoming more decidedly rolling as the streams are approached. As a whole, the type is well drained, though a few small areas near the sources of small streams are permanently wet.

The greater part of this soil is cleared and under cultivation. The forested areas support a growth of oak, hickory, and shortleaf pine. Very little merchantable timber remains.

The Cecil fine sandy loam is adapted to the same crops and is fertilized in practically the same way as the Cecil sandy loam.

Near lines of transportation this type is held at $100 an acre, while some of the more remote areas have a value of about $20 an acre

CECIL CLAY LOAM.

In a general way the Cecil clay loam is intermediate between the Cecil clay on the one hand and the Cecil sandy loam on the other. The surface soil of the typical areas of this type is a brownish-red to red clay loam or loam having a depth of 5 to 10 inches. The subsoil to a depth of 3 feet or more consists of a deep-red, stiff, brittle clay, sometimes carrying considerable mica in the lower part. Frequently the surface material to a depth of 2 or 3 inches is a fine, medium, or coarse sandy loam, grading into the clay loam. There are mapped with the Cecil clay loam a number of tracts of Cecil coarse sandy loam, sandy loam, fine sandy loam, and clay, too small to be shown separately on the soil map. The Cecil clay loam also includes inextensive areas in which the surface has a rusty-brown or snuff-colored appearance and where the material is less compact than is typical. During tillage operations the soil of these areas pushes ahead of the plow and does not turn freely, and it is locally known as "push land" or "shove land." Crop yields on these spots are poor, and as a rule they do not respond to treatment for improvement as well as the typical soil. On the crests of knolls and ridges white quartz rock is frequently conspicuous, and in some instances other rock fragments occur on the surface.

The Cecil clay loam is by far the most extensive soil type in Rowan County. It is found throughout the area of granitic rocks, though it does not occur at all in the slate belt. In many instances the continuity of this soil is broken only by small spots of the other types. One of the largest areas extends from near Salisbury southward into Cabarrus County. The soil is also typically developed east of

Spencer, around Bear Poplar, near Piney Grove School, and south of Mill Bridge. Small areas of the type occur throughout the southern-central, southwestern, and western parts of the county.

The Cecil clay loam is found in all topographic positions except the lowland along the streams and the crests of the low "mountains." Many broad interstream areas occur along the railroads and public roads, and such areas have a very favorable topography for general farming. Along the Yadkin and South Yadkin Rivers this type in many instances is steeply rolling, hilly, and precipitous, and gullies are of frequent occurrence. Rolling and hilly areas of the type, often including eroded spots, are encountered along nearly all the creeks of the county.

Natural surface drainage is well established over the Cecil clay loam as a whole, but on account of its heavy surface soil and compact subsoil the downward movement of water is somewhat retarded, and the type can not be cultivated so soon after rains as the gravelly and sandy members of the series.

Near Salisbury and the other larger towns the Cecil clay loam is mainly under cultivation. More remote areas are forested with red oak, white oak, hickory, post oak, shortleaf pine, and maple, together with a scattering of dogwood, locust, persimmon, walnut, cedar, poplar, and sassafras. Nearly all the merchantable timber has been cut, and the present growth is valuable mainly for firewood.

The Cecil clay loam is admirably adapted to the production of corn, wheat, cotton, oats, rye, clover, and grasses, and it is used mainly for these crops. Corn produces 20 to 60 bushels per acre, and occasionally yields of 70 to 80 bushels are obtained. Wheat yields range from 10 to 30 bushels, and as much as 40 bushels in a few instances. The yields of cotton vary from one-half to 1 bale per acre, averaging about three-fourths bale, and oats produce 20 to 50 bushels per acre. Irish potatoes, cabbage, tomatoes, sweet corn, turnips, beans, and strawberries are grown successfully, both for local marketing and for home use. Red clover, crimson clover, soy beans, and sorghum are grown to a small extent, and small quantities of apples, peaches, pears, cherries, and figs are produced.

Fertilizer practices on the Cecil clay loam vary widely with different farmers. The general practice, however, is to apply about 200 pounds per acre of an 8–2–2 or 8–3–3 mixture with cotton, corn, wheat, and oats. In a few instances a home mixture consisting of 300 pounds of Tennessee phosphate rock and 300 pounds of Thomas slag with 25 pounds of nitrate of soda is applied to cotton at the rate of 600 pounds per acre, with satisfactory results. An acreage application of 200 pounds of 16 per cent phosphoric acid has proved effective where cotton follows a green cover crop. If corn follows clover

or cowpeas, it is usually not fertilized. If it does not follow these crops, about 200 pounds per acre of an 8–2–2 or 8–3–3 mixture is usually applied.

This soil, as a rule, for maximum yields requires relatively heavy applications of acid phosphate, smaller quantities of potash, and considerable nitrogen.

Land of the Cecil clay loam type varies widely in value. Near Salisbury and the larger towns it is held at $100 to $125 an acre, while in more remote locations it can be bought for $40 to $50 an acre. Around Mill Bridge and in a few other localities it is valued at $70 to $100 an acre.

CECIL CLAY.

The Cecil clay consists of 4 to 6 inches of reddish-brown to red clay loam or clay, underlain by a red, stiff, tough clay which extends to a depth of at least 3 feet. Included with this type are many spots in which the heavy red clay is exposed. These spots are locally referred to as "tight land," while the type as a whole is locally called "heavy red-clay land." In some places there is a surface mantle, 1 or 2 inches thick, carrying a large quantity of fine, medium, or coarse sand. In road cuts small quartz veins are sometimes seen, and occasionally larger ones outcrop within areas of the type, giving rise to stony spots.

The Cecil clay has its greatest development in the central part of the county. The largest area extends from Liberty Hall School in a southwest direction nearly to Prospect Church, a distance of about 11 miles. It is also typically developed in the vicinity of Third Creek Church, and westward to the Iredell County line. Small bodies occur southwest of Salisbury along the main line of the Southern Railway nearly to China Grove. Smaller areas are distributed throughout the greater part of the county.

The Cecil clay occupies broad, level to gently rolling interstream areas, which become broken and hilly as the streams are approached. Streams passing through this type in the southwestern part of the county have developed comparatively deep channels, leaving this type of soil on the steeply rolling and precipitous slopes along their courses. Some of the interstream areas lie along railroads and public highways, and the surface of these is well suited to general farming. All of the type is sufficiently sloping to insure adequate surface drainage, but owing to the heavy nature of both soil and subsoil the internal drainage is not so good as in the gravelly and sandy members of the Cecil series.

Only a small part of the Cecil clay remains in forest. The original growth consisted of white oak, red oak, post oak, hickory, shortleaf

pine, black gum, and sweet gum, with some cedar, walnut, locust, dogwood, sassafras, and persimmon.

The Cecil clay is one of the strongest soils of the county. It is especially well suited to the production of corn, wheat, oats, rye, cotton, clover, and grasses. Irish potatoes, sweet corn, beans, garden peas, beets, cabbage, tomatoes, onions, and strawberries are grown successfully both for local markets and for home use. Sorghum does well, but the sirup is darker than that made from cane grown on the lighter soils. Summer apples, pears, peaches, cherries, and figs are grown in small orchards near the farm houses.

Crop yields on this type are comparable with those obtained on the Cecil clay loam. This soil is fertilized in practically the same way as the clay loam, and it can be built up to a state of high productiveness.

Near Salisbury and in other desirable localities the Cecil clay is held at about $100 to $125 an acre, while in more remote locations it can be bought for $30 to $75 an acre.

Durham Series.

The soils of the Durham series are characterized by the grayish color of the surface soils and the yellow color of the subsoils. They are derived from light-colored, rather coarse grained granite and gneiss, consisting principally of quartz and feldspar with some mica. The topography as a rule is gently rolling and the drainage thorough or in places excessive, owing to the sandy, porous texture of the subsoil. Two types of this series are mapped in Rowan County, the Durham coarse sandy loam and the Durham sandy loam.

Durham coarse sandy loam.

The surface soil of the Durham coarse sandy loam is a gray or light-gray, loose, porous, coarse loamy sand or sandy loam, passing into a pale-yellow loamy sand or sandy loam at a depth of about 6 to 8 inches. The subsoil, which may be encountered at any depth between 12 and 24 inches, is a yellow, friable coarse sandy clay, usually extending to a depth of 3 feet or more, but sometimes passing into the disintegrated bedrock in the lower part of the 3-foot section. There are included with this type spots of Durham sandy loam and fine sandy loam. Locally the subsoil of this type is a light-red or red, friable coarse sandy clay, passing into the disintegrated parent rock at a depth of about 24 inches. These areas would be classed as Cecil coarse sandy loam if of sufficient size to be shown on the soil map.

The Durham coarse sandy loam is not extensive in Rowan County. The greater part of the type occurs in three areas, one of which extends southward from Liberty Church, another 3 miles south of

China Grove, and the third along the Rowan-Cabarrus county line 3 miles southeast of Landis. A number of smaller bodies occur in the southern and southwestern parts of the county.

The surface of the Durham coarse sandy loam varies from gently sloping to rolling and hilly. The topography of the greater part of the type is favorable for general farming. Owing to its topography, together with its porous soil and friable subsoil, the surface drainage and internal drainage are well established.

Only a very small part of the Durham coarse sandy loam is in forest. The original forest growth consisted mainly of white oak, red oak, post oak, hickory, and shortleaf pine.

This type is suited to a wide range of crops. As demonstrated in other sections of the State, it is especially well adapted to the production of bright-yellow tobacco, although it is not used for this crop in Rowan County. It is a highly prized soil for cotton, cowpeas, and sweet potatoes.

The principal crops for which it is utilized are cotton, corn, wheat, oats, and rye. Sweet potatoes, Irish potatoes, beans, tomatoes, onions, and turnips do well, but are grown only for home use and local marketing. The soil is well suited to peaches, pears, grapes, and summer apples. Peanuts thrive, and could doubtless be made a crop of commercial importance.

Corn and cotton are commonly fertilized with an application of 300 to 400 pounds per acre of an 8–2–2 mixture. A home mixture of bone meal and potash is sometimes used for wheat, corn, and cotton. The most successful farmers grow clover or cowpeas on the land to be used the following year for corn, wheat, and cotton whenever possible. Cotton yields range from one-fourth to 1 bale per acre, corn from 15 to 30 bushels, and wheat from 8 to 20 bushels. Watermelons and cantaloupes do well on this type.

The Durham coarse sandy loam is deficient in humus, which is easily and cheaply supplied by plowing under rye, cowpeas, or crimson clover or by applying barnyard manure.

The value of the Durham coarse sandy loam ranges from $30 to $60 an acre.

DURHAM SANDY LOAM.

The surface soil of the Durham sandy loam consists of a light-gray or gray medium sandy loam or loamy sand, passing into a yellowish-gray loamy sand at a depth of about 6 to 8 inches. The subsoil, which is encountered at depths of 12 to 20 inches, is a yellow friable sandy clay, sometimes becoming mottled with white or gray at depths of 24 to 30 inches. Frequently the subsoil grades into the disintegrated granite rock at about 30 to 36 inches. In forested areas the surface soil to a depth of 1 or 2 inches is usually dark gray

in color, owing to the presence of organic matter. The surface soil of this type as a whole is not a uniformly medium sandy loam, but contains a relatively high percentage of fine sand and an appreciable quantity of coarse sand particles. There are included with this type many small tracts of Durham fine sandy loam.

The largest areas of this type occur about 2 miles northwest of Gold Hill, near Poole School, 1 mile northwest of Majolica, and near Spencer. Small areas occur in the central, southern, and southwestern parts of the county.

The greater part of the type is comparatively smooth and well suited to general farming and to the use of improved farm machinery. There is sufficient slope to afford adequate surface drainage, and the subsurface soil and subsoil are porous and friable enough to induce good internal drainage.

A large part of the Durham sandy loam is under cultivation, while the remainder supports a growth of hardwoods, including hickory, white oak, red oak, and post oak. The greater part of the merchantable pine has been removed.

The Durham sandy loam is an excellent soil for bright-yellow tobacco, though none of this crop is grown at present. It is also a valuable soil for cotton, corn, wheat, oats, rye, sweet potatoes, Irish potatoes, watermelons, cantaloupes, peanuts, and all the truck crops and garden vegetables common to this section of North Carolina. Tree fruits, including peaches, pears, plums, and summer apples, do well, but are grown only to a small extent.

The yields of corn, wheat, oats, and cotton are slightly greater on this soil than on the Durham coarse sandy loam, though both of these types are fertilized in practically the same way.

The value of the Durham sandy loam ranges from $20 to $60 an acre.

Appling Series.

The Appling soils are prevailingly grayish, ranging to pale yellow. The subsoils are mottled or streaked red and yellow, and occasionally grayish or drab. This series is developed in the Piedmont Plateau. The soils are residual from schist, hornblende schist, gneiss, and granite. The topography is about the same as that of the Cecil series, but possibly somewhat less rolling. These soils in Rowan County are well drained. Two members of the Appling series are encountered in this county, the gravelly loam and sandy loam.

Appling gravelly loam.

The surface soil of the Appling gravelly loam, to a depth of 8 to 14 inches, consists of a gray or yellowish-gray fine sandy to silty loam, carrying 20 to 60 per cent of very small angular quartz gravel and

coarse sand particles. The subsoil is predominantly a yellowish-red, salmon-red, or brownish-yellow friable clay, which also contains a large percentage of small gravel. This clay, in places, extends to a depth of 3 feet or more and in others grades into the disintegrated granite at depths of 10 to 36 inches. Frequently where the subsoil extends to a depth of 3 feet the lower part consists of a mottled or streaked yellow and red clay. Locally the subsoil varies in color from yellow through various shades to red. Granite bowlders outcrop frequently within areas of this type and quartz fragments are present on the surface of small areas.

The Appling gravelly loam is confined to the south-central part of the county. Nearly all the type is embraced in one area, which extends south from Granite Quarry through Faith to a point 1 mile south of Rock Grove Church. Other areas occur near New Zion Church, north of Liberty Church, and near St. Peters Church.

This type occupies gently rolling, rolling, and hilly country with interstream areas having a gently sloping surface. Owing to its topographic position, together with its porous soil and friable subsoil, this is one of the most thoroughly drained soils of the county.

Nearly all of the merchantable timber has been removed from this soil. The original growth consists of white oak, post oak, red oak, hickory, and shortleaf pine. On some parts of the type there remains a growth of oak and hickory suitable for firewood.

The Appling gravelly loam is one of the most desirable soils of the county for cotton, garden vegetables, and tree fruits. It is also well suited to the production of bright tobacco, though this crop is not grown. Sweet potatoes, Irish potatoes, peanuts, and sorghum do well, but are grown only for home use and for local markets. The type is used more extensively for cotton than for any other crop, though corn, wheat, oats, and clover are grown to some extent. Peaches, pears, plums, grapes, and summer apples do exceptionally well on this type.

With an acreage application of 200 pounds of 8–2–2 or 8–3–3 fertilizer cotton yields from three-fourths to 1 bale per acre, corn 10 to 25 bushels, and wheat 5 to 15 bushels.

As a result of its continuous cultivation to cotton and other clean-culture crops, the Appling gravelly loam is deficient in humus.

The Appling gravelly loam ranges in value from $40 to $75 an acre.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam consists of a gray or yellowish-gray medium sandy loam, passing into a pale-yellow or light-gray sandy loam at an average depth of about 6 or 8 inches. The subsoil, which is usually encountered at depths of 10 to 15 inches, consists of a reddish-yellow or mottled red and yellow, friable sandy

clay. The surface soil is not uniformly a medium sandy loam. Noticeable quantities of coarse sand are present in some areas, particularly in the more elevated portions of the type, and in such places it is a coarse sandy loam. In a few instances white quartz fragments occur on the surface and occasionally bowlders of the parent granite rock outcrop. Included in this type are spots having a decidedly red subsoil, and in other places the subsoil is yellow with gray or red mottlings in the lower part. If these areas were large enough to be shown separately they would be mapped as the Cecil sandy loam and Durham sandy loam, respectively.

The Appling sandy loam is of small extent in Rowan County. The largest body lies in a strip varying in width from a fraction of a mile to 1 mile, and extending south from Granite Quarry for 5 miles. Two other important areas are encountered near Woodleaf, while smaller areas occur in the south-central part of the county.

The surface of the Appling sandy loam is gently rolling to rolling, and as a result of its topography, together with its porous soil and brittle subsoil, the type is well drained.

Nearly all of the type is under cultivation. A small part is forested with white oak, post oak, red oak, and shortleaf pine. This is one of the best soils in the county for cotton, corn, cowpeas, garden vegetables, and fruits. Cotton yields from one-half to 1 bale per acre and corn from 15 to 50 bushels. Crops on this type receive about the same fertilizer treatment as on the other soils of the county. The study of the relation of soils to fertilizers receives little attention.

The greater part of the Appling sandy loam is fairly well located with respect to county roads and railroad lines. It is valued at $40 to $75 an acre.

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

Mechanical analyses of Appling 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.*
233419	Soil	9.3	21.4	9.0	27.5	13.4	14.0	5.4
233420	Subsoil	6.0	10.4	4.4	13.4	6.2	14.5	45.0

IREDELL SERIES.

The soils of the Iredell series are prevailingly brown, ranging from light brown to almost black. The subsoil consists of extremely plastic, sticky, or waxy clay of yellowish-brown to greenish-yellow color. Disintegrated rock is frequently encountered within the 3-foot soil section. Small iron concretions are sometimes found in the soil.

This series is developed in the Piedmont Plateau. The soils are residual, the parent rock consisting mainly of diorite diabase, hornblende schist or hornblende gneiss, and chloritic rocks. The topography varies from nearly flat to gently rolling, and the drainage is usually good. In Rowan County three types are recognized—the Iredell stony loam, fine sandy loam, and loam.

IREDELL STONY LOAM.

The soil material of the Iredell stony loam, to an average depth of 6 to 8 inches, consists of a dark-gray to grayish-brown heavy fine sandy loam. In most places fragments of diorite rock, varying in size from small stones to large bowlders, are scattered over the surface. There is also found on the surface and intermingled with the soil a high percentage of small, rounded, brown or black iron concretions. The subsoil is a yellowish-brown or dingy-brown, tough, sticky, impervious clay, passing into the yellowish-green, partially decomposed diorite rock at a depth of 20 to 24 inches. In places on the steeper slopes the heavy, sticky subsoil is absent and a thin mantle of surface soil rests directly upon the bedrock.

The Iredell stony loam is confined to one area of 1 square mile on Youngs Mountain, 1 mile north of Barber. Near the summit the surface of this type is decidedly steep and precipitous, but toward the foot the slopes grow more gentle and the land is better for farming. In some places near the base of the mountain seepage waters appear at the surface and give rise to poorly drained spots. Owing to its topography, however, the greater part of the type is well drained.

Only a few acres of this soil are under cultivation. Cotton and corn, the only crops for which the type is used, are grown in small patches. The type is mainly forested with red oak, white oak, post oak, blackjack oak, black gum, shortleaf pine, maple, and dogwood. It is best suited to forestry and peach-orcharding, though where cleared it is fairly well suited to pasturage. The Iredell stony loam, on the whole, has a low agricultural value.

IREDELL FINE SANDY LOAM.

The surface soil of the Iredell fine sandy loam extends to a depth of 6 to 10 inches and consists of a gray to brownish-gray, heavy fine sandy loam, carrying on the surface and throughout the soil a large quantity of small, rounded iron concretions of brownish color. The subsoil is a yellow, yellowish-brown or brown, heavy, sticky, plastic clay which usually passes into the disintegrated diorite rock at a depth of about 24 to 30 inches. Local variations are numerous throughout this type. In the south-central part of the county, near the Cabarrus County line, there are areas where the iron concretions

are absent and the surface soil is light gray in color, closely resembling the Durham soils. The subsoil of these areas is usually not encountered nearer the surface than 18 or 20 inches. There are included with this type small tracts of Iredell sandy loam and Iredell loam too small to be shown separately on the soil map. Along the boundaries between the Iredell fine sandy loam and the Cecil soils there are strips or spots having a reddish tinge in both the surface soil and subsoil. These properly belong to the Mecklenburg series and would be mapped as such if of sufficient size to be segregated from the Iredell soil. Locally there is found on the surface and throughout the soil a large quantity of diorite and quartz fragments. Along the hill slopes and near the sources of streams where the type is subject to erosion there are spots where the soil mantle has been removed, leaving the clay subsoil exposed.

In extent the Iredell fine sandy loam is the second most important type of the county. It occurs in areas varying in size from a fraction of a square mile to 3 or 4 square miles. It is confined to no one section of the county, though it has only a small development in the southwestern corner and also in the slate belt. The largest areas of the type lie along the South Yadkin River in the northwestern part of the county and near Barber. Other areas of considerable size occur around Cleveland and Mount Vernon, near Cooleemee Bridge, and southward from Spencer and China Grove. Smaller areas of the type are distributed throughout the south-central part of the county.

The topography of the Iredell fine sandy loam varies from undulating and gently rolling in the interstream areas to steeply rolling and hilly along the drainage ways. Slight depressions having a nearly level surface occur in a few places, but these are inextensive. The smoothest areas of the type occur about a mile southwest of Organ Church, 1½ miles northwest of Rockwell, near Cooleemee Bridge, near Barber, and near Needmore. Owing to its rolling topography, the natural surface drainage is well established over the greater part of the type, but on account of the impervious subsoil subsurface drainage is poor. The surface drainage also is poor in the small depressions.

The forest growth on this type consists of blackjack oak, white oak, post oak, hickory, and shortleaf pine, with some cedar, dogwood, and persimmon.

The Iredell fine sandy loam is well suited to the production of cotton, corn, wheat, oats, rye, clover, and grasses. The lighter and deeper portions of the type are also valued highly for the growing of garden vegetables, such as sweet corn, tomatoes, beans, garden peas, cabbage, beets, turnips, and onions. In some sections of the county this soil is used extensively for Irish and sweet potatoes.

Cotton yields from one-fourth to 1 bale per acre, corn 20 to 60 bushels, wheat 10 to 20 bushels, and oats 15 to 35 bushels. Cotton, corn, and wheat on this soil are usually given an acreage application of 200 to 250 pounds of an 8–2–2 or 8–3–3 fertilizer. A few farmers apply about the same quantity of a 10–4, 10–2, or 10–6 mixture. In some cases 16 per cent acid phosphate is applied at the rate of about 200 pounds to the acre for cotton and wheat when these crops follow winter cover crops. If corn is put on a clover sod it is generally not fertilized at all, though kainit is usually applied to prevent "frenching." Kainit is also used with cotton to prevent "rusting."

The productiveness of the Iredell fine sandy loam is greatly increased by the rotation of crops and by the deep breaking of the soil. A successful rotation on this soil is corn, with cowpeas sowed at the last plowing, followed by winter oats, and then by cotton.

The Iredell fine sandy loam ranges in value from $20 to $60 an acre.

IREDELL LOAM.

The surface soil of the Iredell loam to an average depth of about 8 inches consists of a gray to dark-gray or brown heavy fine sandy loam or loam. Small, rounded iron concretions are scattered over the surface and disseminated throughout the surface soil of the greater part of the type. The subsoil is a stiff, plastic, impervious, heavy clay of yellowish-brown to dingy-brown color. It extends to a depth of 24 to 30 inches, passing into the soft disintegrated diorite rock. The unweathered parent rock is usually encountered at a depth of 4 or 5 feet.

The Iredell loam is not extensive in this county, being developed only in small areas. It occurs as a narrow strip along Town Creek about 1 mile south of Salisbury, and in a number of small areas about 4 miles east and southeast of Salisbury and Spencer. Other small tracts appear in the southern part of the county along the Cabarrus County line.

Interstream areas of this type are gently undulating to rolling, but as the streams are approached the topography becomes broken and hilly, and in a few places the type has suffered from erosion. In some places, especially in the heavier and least rolling areas of the type, the natural drainage is poor, but as a rule the surface drainage is well established. On account of the impervious nature of the subsoil, the downward percolation of water is slow, resulting in poor subsurface drainage.

The Iredell loam supports a growth of blackjack oak, white oak, post oak, and shortleaf pine, with some cedar, hickory, persimmon, dogwood, and locust.

This soil is fairly well suited to cotton, corn, wheat, oats, and sorghum. The principal crops grown are cotton, corn, and wheat,

A large part of the type is in pasture. With an acreage application of 150 to 200 pounds of a low-grade fertilizer, cotton yields one-fourth to three-fourths bale, and wheat 10 to 25 bushels per acre. Corn is usually planted on a clover sod and is not fertilized, except that a light application of kainit is made to prevent "frenching." Oats yield from 15 to 30 bushels per acre. Garden vegetables do well, but are grown only for home use.

The Iredell loam is deficient in organic matter, and another unfavorable characteristic is the imperviousness of the subsoil, which retards root development.

The value of the Iredell loam depends upon the improvements and the location. In general it ranges from $30 to $60 an acre.

Mecklenburg Series.

The surface soils of the Mecklenburg series are predominantly brown. They range from reddish brown to red. The subsoils consist of yellowish-brown stiff clay, and usually grade into disintegrated rock within the 3-foot section. These soils occur in the Piedmont Plateau. They are residual in origin and derived from diorite, metagabbro, and similar rocks. In places the soil appears to be Iredell material in an advanced stage of weathering. The topography is gently rolling, and the surface drainage is good. The series is represented in this county by a single type, the Mecklenburg clay loam.

Mecklenburg clay loam.

The surface soil of the Mecklenburg clay loam is prevailingly a brown or grayish-brown clay loam, ranging in depth from 4 to 8 inches. Frequently the soil has a slightly reddish cast, particularly in the shallower and heavier spots. This type includes patches of Mecklenburg loam, fine sandy loam, and stony loam, which are too intricately associated and too small to be separated satisfactorily on the soil map. Small, rounded iron concretions of a black or brown color are present on the surface and mixed with the soil. The subsoil is characteristically a reddish-brown or ocherous-yellow, stiff, plastic clay. It extends to depths of 24 to 30 inches, and grades into yellowish-green, soft, disintegrated diorite rock.

This type has a very small total area. The largest and most important bodies occur in the vicinity of Cleveland.

The topography is undulating to gently rolling. The type has good surface drainage, but the internal drainage is poor, owing to the impervious character of the clay subsoil, which is unfavorable to the free percolation of rain waters.

The greater part of the type is under cultivation. The remainder is forested with white, red, and post oak, and some hickory, heart

pine, poplar, sweet gum, and elm. The soil is well suited to the production of clover, vetch, oats, wheat, corn, and cotton. Johnson grass is a characteristic plant on this soil. With Japan clover this grass affords good pasturage for cattle.

The Mecklenburg clay loam is a strong and productive soil, and is capable of being built up to a high state of productiveness. Corn yields from 15 to 40 bushels; wheat, 8 to 20 bushels; oats, 20 to 40 bushels; and cotton, one-third to one bale, averaging about three-fourths bale to the acre. Cowpeas and clover do well. Fertilizer practices on this soil are about the same as on the surrounding soils, except for the addition of small quantities of kainit.

The Mecklenburg clay loam is a desirable farming soil. It sells for $20 to $50 an acre.

Georgeville Series.

The Georgeville soils are gray to red or reddish brown, and the subsoils consist of red clay. These soils, like the Alamance, are derived from the "slates" of the Carolina Slate Belt. It is believed that the rocks giving rise to these soils are higher in content of iron-bearing minerals than those giving rise to the Alamance. The topography varies from undulating to rolling or broken along stream slopes. Drainage is good. Four members of the Georgeville series are mapped in Rowan County. These are the stony loam, gravelly silt loam, silt loam, and silty clay loam.

Georgeville stony loam.

The Georgeville stony loam to a depth of 4 to 8 inches consists of a gray to red silty loam. This rests on a red, brittle silty clay, which passes into the partially decomposed parent rock at a depth of 24 to 30 inches. Large quantities of angular slate fragments, varying in size from gravel to large stones, are scattered over the surface and embedded in both soil and subsoil. In some places large bowlders outcrop. Locally there is mixed with the slate fragments a high percentage of white quartz. Generally the surface is so completely covered with these stones that the soil is rendered almost nonagricultural. In small areas the rock formation giving rise to the Georgeville stony loam is cut by diorite dikes, and in such places there are many diorite fragments on the surface.

The Georgeville stony loam has an inextensive development in Rowan County, only a few areas of the type being encountered. The largest area lies just west of Bringles Ferry. Another area, slightly smaller, occurs in the extreme southeastern corner of the county, while the third largest lies on Reids Mountain.

This type occupies the crests and slopes of low "mountains," and the surface is steeply rolling and precipitous. Owing to its topog-

raphy, the type is well drained, and in places it has been gullied by erosion.

The Georgeville stony loam is not cultivated. It supports a forest growth of hickory, white oak, post oak, red oak, maple, poplar, shortleaf pine, and chestnut oak, with some dogwood and sourwood. When cleared it can be used advantageously for the production of peaches, pears, and grapes, and also for pasturage. The agricultural value of the Georgeville stony loam is low.

GEORGEVILLE GRAVELLY SILT LOAM.

The surface soil of the Georgeville gravelly silt loam to a depth of 5 to 8 inches consists of a silt loam varying in color from yellowish gray to salmon red. Distributed over the surface and mixed with the soil are large quantities—from 15 to 60 per cent—of small, rounded slate gravel of a brownish color and platy and angular fragments of gray slate. The subsoil is a silty clay which ranges in color from yellowish red to deep red and has a depth of 15 to 24 inches. It grades into reddish, purplish, and grayish disintegrated slate or is underlain by the bedrock. Locally the surface is covered with platy and angular fragments of slate. In such places the surface soil rests upon the bedrock, and outcrops are common. The fine particles of slate do not interfere with cultivation, but, on the contrary, seem to improve the physical condition of the soil. However, the more slaty patches are not desirable for farming.

The Georgeville gravelly silt loam appears only in the southeastern corner of the county. To the east of Reedy Creek it is the predominant soil, occupying about one-fourth of the total area of this section.

The Georgeville gravelly silt loam has a gently rolling to rolling topography, with gently undulating interstream areas and more steeply sloping strips occupying the bluffs along the streams. The smoothest areas of the type occur along Flat Creek and immediately north of Corinth Church. There are no steeply rolling and precipitous areas. Owing to its surface features and gravelly structure, the type is well drained.

The native vegetation consists of red oak, white oak, post oak, shortleaf pine, black gum, and dogwood, together with some cedar and persimmon.

This soil is best suited to wheat, oats, corn, clover, and grasses. Wheat yields range from 8 to 15 bushels, averaging about 10 bushels per acre, while corn produces an average of about 25 bushels per acre. As a rule oats are not thrashed, but are fed in the straw. Wheat on this type usually receives about 100 pounds per acre of an 8–2–2 fertilizer, and corn 100 to 150 pounds per acre. Cotton is not grown on this type.

Owing to the gravelly loamy nature of this soil, it works into good tilth and is capable of being built up to a high state of productiveness. The soil responds to the application of burnt lime and phosphoric acid fertilizers.

The value of the land of the Georgeville gravelly silt loam varies from $10 to $40 an acre, depending upon its location and state of improvement.

GEORGEVILLE SILT LOAM.

The Georgeville silt loam consists of a yellowish-gray to slightly reddish silt loam which usually passes at a depth of 3 to 6 inches into a pale-red or yellowish-red silt loam. This grades quickly into the subsoil, which is typically a dull-red, stiff but fairly brittle, silty clay extending to a depth of 3 feet or more. In many small areas the surface soil consists of a pale-red to reddish-brown silt loam, and this rests directly upon the silty clay subsoil. This type is so intricately associated with the Georgeville gravelly silt loam, Georgeville silty clay loam, Alamance silt loam, and Alamance gravelly silt loam, and in places the transition from one of these types into the other is so gradual, that it is almost impossible to establish definite boundaries between them. Over the surface of many parts of the type there is encountered an appreciable quantity of fragments of the parent rock and in other places, particularly on the knolls and ridges, quartz rock fragments are present. With these stones, and in a few instances where these stones do not occur, there is present on the surface a noticeable quantity of smooth, flat, rounded slate gravel, usually of a reddish-brown color.

The Georgeville silt loam is developed mainly in the southeastern corner of the county, between Reedy Creek and the Yadkin River. It occurs in areas varying in size from a fraction of a square mile to 2 or 3 square miles. The type is also encountered in the extreme northwestern corner of the county, where it occurs in one isolated area, covering about 1 square mile. The soil in this area is apparently derived from a slate of whetstone texture, and is therefore not typical.

The surface of the Georgeville silt loam is rolling to hilly, with gently undulating areas lying at the greatest distances from the streams. The natural surface and subsurface drainage is well established over the greater part of the type, though in small depressions, occupied by the heavier phases of the soil, the compact nature of the subsoil prevents the free downward passage of rain water.

The greater part of the Georgeville silt loam is under cultivation. The uncultivated areas are forested with oak, hickory, black gum, shortleaf pine, and dogwood. This soil is well suited to the growing of wheat, corn, oats, clover, sorghum, and grasses. It is used prin-

cipally for the production of wheat, corn, and oats. With an acreage application of 100 to 150 pounds of an 8–2–2, 8–3–3, or a 10–4 fertilizer it produces 8 to 20 bushels of wheat per acre, 15 to 35 bushels of corn, and 15 to 30 bushels of oats. Fruits, such as peaches, pears, and grapes, do well, but they are grown only for home consumption. No cotton is grown on this type.

With the exception of the presence of fine slaty gravel the Georgeville silt loam has all the characteristics of the Georgeville gravelly silt loam, with which it is closely associated in occurrence as well as in origin and process of formation. The value of this type ranges from $15 to $40 an acre.

GEORGEVILLE SILTY CLAY LOAM.

The Georgeville silty clay loam consists of a reddish-brown to red silty clay loam, underlain at 5 to 8 inches by a deep-red, stiff but fairly brittle clay or silty clay which extends to a depth of 3 feet or more. Scattered over the surface of small areas throughout the type there is an appreciable quantity of slate fragments and white quartz rock, the latter being especially conspicuous in the more elevated portions of the type. Along the boundaries between this soil and the gravelly types owing their origin to the slates there is usually present on the surface a small quantity of fragmentary slate.

Like the other soils derived from the Carolina slates, the Georgeville silty clay loam is confined for the most part to the southeastern part of the county or that section between Reedy Creek and the Yadkin River. One of the largest areas, however, lies about 2 miles south of Salisbury and Spencer along both sides of Town Creek.

The surface of the Georgeville silty clay loam varies from gently undulating to rolling and hilly. The smoothest portions of the type occupy the crests of drainage divides, while the more rolling areas are found along the stream slopes. Owing to its topography, the type has good natural surface drainage, but on account of the heavy nature of both soil and subsoil the downward movement of rain water is slow, and crops on this soil can not be cultivated immediately after rains.

The greater part of the Georgeville silty clay loam is cultivated. A part of the type is forested with oak, hickory, shortleaf pine, and dogwood.

This is one of the strongest soils of the county. It is well suited to the production of wheat, corn, oats, clover, and grasses. The principal crops grown on it are wheat, corn, oats, and clover. Wheat yields range from 10 to 25 bushels, averaging about 12½ bushels per acre, corn yields 15 to 35 bushels, and oats 20 to 40 bushels per acre. As a rule, wheat is given an acreage application of 100 to 250 pounds

of an 8–2–2, 8–3–3, or a 10–4 fertilizer. Corn is usually planted on a clover sod and no fertilizer applied.

The value of the Georgeville silty clay loam ranges from $20 to $75 an acre.

Below are given the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Georgeville silty 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.*
233433	Soil	1.2	2.0	1.0	3.6	5.0	43.0	43.9
233434	Subsoil	.1	.2	.2	1.5	2.9	39.6	55.5

ALAMANCE SERIES.

The surface soils of the Alamance series are gray or yellowish gray to almost white, and have a silty texture. The subsoils consist of yellow, compact silty clay. The Alamance series owes its origin to the weathered products of the "Carolina slates," forming a belt in central North Carolina and extending a short distance into South Carolina. These slates are usually quite fine-grained and contain little mica. They differ in structural and mineralogical characteristics from the sericitic and micaceous schists giving rise to the York soils of the Piedmont, the Alamance soils being less micaceous and lacking the greasy feel of the York subsoils. Thin slate fragments and small, smooth and rounded slaty gravel are generally present on the surface. The topography varies from nearly flat to rolling or, in some places, steeply rolling. Two members of the Alamance series, the gravelly silt loam and the silt loam, are recognized in Rowan County.

ALAMANCE GRAVELLY SILT LOAM.

The Alamance gravelly silt loam to an average depth of 8 inches consists of a gray to rather dark gray silt loam. The type carries on the surface and intermixed with the soil about 15 per cent of small, flat, smooth, and rounded slaty gravel and fragments, usually of a bluish-gray or brown color. The subsoil is a pale-yellow silty clay passing into the partially weathered slate at a depth of about 24 inches. In places there is an appreciable quantity of the fine slaty gravel embedded in the subsoil. Where this type occupies slopes along streams there are spots from which both soil and subsoil have been removed, leaving the parent rock exposed or covered with only a thin mantle of soil.

In occurrence and also in point of origin and process of formation the Alamance gravelly silt loam is closely associated with the other soils of the slate belt, and in places this type merges into those soils so gradually that it is almost impossible to fix definite boundaries. Small bodies of each of these types occur within the others.

In location the Alamance gravelly silt loam is confined to the slate belt in the southeastern corner of the county. It occupies about one-fourth of the total area of this section. The largest body extends from Corinth Church southward into Cabarrus and Stanly Counties. Other areas of considerable importance occur near Poole Town and near St. Mathews Church.

The surface features of the Alamance gravelly silt loam vary from nearly level or gently undulating to rolling and steeply rolling. The smoothest parts of the type occupy elevated areas lying at a considerable distance from the streams.

Over the greater part of this type the drainage, both surface and subsurface, is fairly well established. Small, flat depressions occur within the more elevated areas, and it is only in such places that the drainage is not good.

The native vegetation consists of red oak, white oak, post oak, black gum, sweet gum, maple, hickory, and shortleaf pine. Only a small part of this type is under cultivation. It is best adapted to wheat, corn, and oats, and these are the principal crops grown. Wheat yields range from 8 to 25 bushels, and corn yields from 15 to 40 bushels per acre. Wheat is usually fertilized at the rate of 100 to 200 pounds per acre with an 8–2–2 mixture. When corn does not follow clover or cowpeas, it is fertilized in practically the same way.

This soil has a compact structure and is greatly benefited by deep plowing, subsoiling, and by thorough pulverizing. The greater part of the type is low in humus. The value of the Alamance gravelly silt loam varies from $10 to $50 an acre.

ALAMANCE SILT LOAM.

The surface soil of the Alamance silt loam, locally called "white floury land," consists of a light-gray, yellowish-gray or almost white, mellow silt loam, passing into a pale-yellow or yellowish-gray compact silt loam at a depth of 4 to 6 inches. The subsoil, beginning at depths of 8 to 12 inches, is a yellow silty clay or clay which usually grades into the disintegrated parent rock at 20 to 30 inches. The type as mapped includes spots in which small quantities of slate gravel and fragments are present on the surface and throughout the soil section. In a few places the subsoil of this type blends with the subsoil of the Georgeville series, and is pale red in color.

The Alamance silt loam occurs mainly in the slate region between Reedy Creek and the Yadkin River, though an isolated area, covering

nearly a square mile, is encountered in the extreme northwestern corner of the county. One of the largest areas is a narrow strip extending north from Zion Church nearly to Bringles Ferry. Other large bodies occur immediately east of Gold Hill, near Gold Hill Church, 1½ miles east of Liberty Church, and 2 miles south of St. Mathews Church.

The greater part of this type occupies interstream country and probably has the most even topography of any soil of the slate belt. In general it is sufficiently rolling to insure good drainage, yet not hilly enough for serious erosion.

The Alamance silt loam is not considered a strong soil, and only a small part of it is under cultivation. The native timber growth includes oak, hickory, shortleaf pine, and dogwood. This soil is best suited to wheat, corn, oats, rye, clover, and grasses. Crop yields on the type as a whole are somewhat lighter than on the gravelly silt loam, though some portions of it produce as good yields as that type. The Alamance silt loam is valued at $8 to $40 an acre.

Wickham Series.

The Wickham series includes brown to yellowish-brown or faint reddish brown soils overlying yellowish-brown to reddish, friable subsoils. Gravel may or may not be present in the subsoil, though it does not occur in thick beds. These soils occur on terraces along the streams within the crystalline-rock belt of the Appalachian and Piedmont region and in adjacent parts of the Coastal Plain where the material contains a considerable quantity of material derived from the crystalline rocks.

WICKHAM FINE SANDY LOAM.

The surface soil of the Wickham fine sandy loam typically consists of a yellowish-brown to brown fine sandy loam, varying in depth from 8 to 14 inches. This is underlain by a yellowish-red to light-red, compact but friable fine sandy clay. Narrow strips of this type occurring along a few of the creeks have a decidedly yellowish subsoil, which is mottled with gray and brown in the lower depths. Such areas would be classed as the Alta Vista fine sandy loam if they were of sufficient size to be mapped as a separate type. In some places, particularly along the Yadkin River, spots of very fine sandy loam are encountered.

The Wickham fine sandy loam is a second-terrace soil, and is not extensive in Rowan County. It is developed in small areas along the Yadkin River, and in narrow strips bordering the first-bottom soils along Sills, Kerr, and Town Creeks, and along the headwaters of Crane Creek.

This type is considered a fair soil for corn, oats, wheat, watermelons, cantaloupes, sorghum, and meadow grasses. In many places it is fenced and used for pasturage. Corn yields from 15 to 40 bushels per acre, oats 20 to 45 bushels, and wheat 8 to 18 bushels.

As a rule crops on this type are not fertilized, though in a few instances an acreage application of about 200 pounds of an 8–2–2, 8–3–3, or a 10–4 mixture is made. Owing to the compact nature of this soil it is greatly benefited by deep breaking and thorough pulverizing. Those areas of the type devoted to pasturage are generally in need of lime.

The value of the Wickham fine sandy loam ranges with that of the adjoining upland soils.

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

Mechanical analyses of Wickham 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.*
233423	Soil	0.2	1.4	3.2	36.1	29.1	21.1	8.9
233424	Subsoil	.2	.9	2.6	39.1	15.6	13.3	28.4

CONGAREE SERIES.

The soils and subsoils of the Congaree series are brown to reddish brown, there being comparatively little change in texture, structure, and color from the surface downward. Occasionally grayish and yellowish mottling is encountered in the subsoil of the poorly drained areas. These soils are developed in the overflowed first bottoms of the streams of the Piedmont Region and in similar positions in the Coastal Plain along streams issuing from the Piedmont. The material is derived from the soils of the Piedmont Region, with some mixture of Appalachian material, and in the Coastal Plain with a slight mingling of Coastal Plain material. In Rowan County the Congaree series includes three types, the fine sand, fine sandy loam, and silt loam.

CONGAREE FINE SAND.

The surface soil of the Congaree fine sand is a light-brown uniform fine sand. It has a loose, mellow structure and ranges in depth from 8 to 12 inches. The subsoil has a lighter brown color than the surface soil and consists of an incoherent fine sand to a depth of 3 feet or more. Small, finely divided mica scales are present in the soil and, frequently in larger quantities, in the subsoil. In places at a depth of 30 inches a dark-gray to nearly black fine sand is encountered.

The Congaree fine sand has a small total area in Rowan County. It is encountered along the South Yadkin and Yadkin Rivers, where it occurs as narrow bands or strips lying close to the streams. It lies slightly more elevated than the other Congaree soils, and for this reason, together with its porous structure, it is better drained.

This soil is best suited to the production of corn, oats, cantaloupes, and watermelons, and practically all of the type is under cultivation. Corn yields from 20 to 40 bushels per acre, and oats 15 to 40 bushels.

The fine sand, like the other Congaree types, is held in connection with the adjoining uplands, and its value varies with that of those soils.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Congaree fine sand:

Mechanical analyses of Congaree fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
233415	Soil	0.0	1.2	3.7	66.3	16.7	7.8	4.1
233416	Subsoil	.0	1.2	4.1	68.5	14.4	7.0	4.4

CONGAREE FINE SANDY LOAM.

The surface soil of the Congaree fine sandy loam has a depth of 8 or 10 inches, and consists of a yellowish-gray, mellow fine sandy loam. The subsoil is a yellowish-brown fine sandy clay which becomes stiffer with increasing depth. Mica scales are present in both the soil and subsoil. This type includes small areas of Congaree silt loam which are so intricately associated with the fine sandy loam that they can not be shown on the soil map. Usually along the smaller streams the subsoil of this type grades at about 24 to 30 inches into a bluish-drab silty clay to fine sandy clay.

This type occurs along the South Yadkin and Yadkin Rivers, and along some of the minor streams of the county.

The Congaree fine sandy loam is a first-bottom soil, and its surface is nearly level. Some areas of the type occur in old drainage channels, 3 to 5 feet lower than the average of the type. The typical areas of the type slope gently toward the stream channels. This soil is well drained, though it is subject to overflow during freshets.

The greater part of the Congaree fine sandy loam is under cultivation. It is devoted to the production of corn, oats, melons, and grasses. Corn yields from 15 to 40 bushels per acre, while oats produce from 15 to 35 bushels per acre. No commercial fertilizers are used on this type. The better drained portions of the Congaree fine sandy loam are highly esteemed for corn and oats.

CONGAREE SILT LOAM.

The surface soil of the Congaree silt loam is a brown to reddish-brown silt loam ranging in depth from 8 to 12 inches. The subsoil is a brown to chocolate-brown, compact silt or silty clay loam to a depth of 36 inches or more. Both soil and subsoil contain finely divided flakes of mica, the quantity being sufficient in places to give the soil a greasy feel.

This type is subject to numerous variations which are important agriculturally but are not sufficiently extensive to be indicated on the soil map. In places small areas of fine sand occur as ridges. In some instances a substratum of fine sand is encountered in the lower part of the 3-foot section, and this gives the soil a more porous structure than in typical areas. Along some of the larger creeks there is occasionally a thin surface layer of coarse sand or fine gravel. The subsoils of areas along the larger creeks usually grade at depths of 24 to 30 inches into a bluish or mottled gray and brown silty clay or fine sandy clay. Along some of these streams spots of Congaree silty clay loam are mapped with this type.

The Congaree silt loam is most typically developed along the South Yadkin and Yadkin Rivers. It occurs also along Second, Third, Fourth, Sills, Kerr, Back, Grants, Buffalo, and Town Creeks, and a number of smaller streams.

In general the topography of this soil type is flat and almost level, with a gradual slope toward the stream course and in the direction of its flow. Swales or sloughs and stagnant pools are of frequent occurrence. These depressions are naturally poorly drained, and can be reclaimed and made suitable for farming only by constructing ditches. The sand ridges associated with this type are formed by swift currents during the overflow of the streams. They have gently rolling surface features and an elevation of a few feet above the surrounding soil.

The Congaree silt loam is alluvial in origin, being derived from soil material transported from the surrounding uplands and deposited along the streams by water action. The soil as a rule occupies a low-lying position along the streams, and is subject to overflow. The drainage is poor. All of it can be drained and reclaimed except some of the low-lying areas along the rivers.

The native growth consists of sweet gum, birch, water oak, willow, ash, and elm, together with a wide variety of water-loving shrubs and grasses. Along the South Yadkin and Yadkin Rivers the type is mainly under cultivation, but very little of this soil along the large creeks and smaller streams is suitable for agriculture, on account of poor drainage. The areas along these creeks are used chiefly as pastures and for the production of hay.

This type is well adapted to the growing of corn and oats. Corn yields from 20 to 50 bushels per acre, while oats produce 20 to 40 bushels per acre. These yields are secured without the aid of commercial fertilizers.

This soil is usually sold in connection with the adjoining uplands, and its value depends upon that of the upland soils.

Wehadkee Series.

The Wehadkee soils are gray and prevailingly compact and silty. The subsoils are mottled white or grayish and yellowish or yellowish brown, are compact in structure, and usually have a clay to silty clay texture. These soils are developed in the first bottoms of streams, and consist of alluvial material from Piedmont soils. They are subject to overflow, and hold the position in the Piedmont region that the Bibb soils do in the Coastal Plain. The Wehadkee series is represented in this county by a single type, the silt loam.

Wehadkee silt loam.

The surface soil of the Wehadkee silt loam consists of a gray or gray mottled with brown, heavy silt loam, ranging in depth from about 6 to 10 inches. It is underlain by a mottled gray, brown, and ocherous-yellow silty clay which extends to a depth of 3 feet or more. Where this type adjoins the uplands and also near the heads of small streams the surface soil is locally a light-gray to whitish silt loam, and the subsoil a mottled yellow and gray silty clay. Occasionally both the soil and subsoil show faint streaks or have a speckled appearance, due to the presence of brown or black soft iron pebbles or to iron stains.

This type has a very inextensive development. It is confined to a few narrow strips in the southeastern corner of the county. The longest and widest bodies are developed along Flat and Cedar Creeks, while a few other strips border some of the smaller streams in that locality.

The Wehadkee silt loam occupies the first bottoms of streams, and in general has a uniformly level and flat surface. Some of the narrower strips have a flat surface with a gradual slope toward the streams. This type lies at an elevation of only a few feet above the normal water level of the streams, and is subject to frequent overflow. The drainage, both surface and internal, is poor, but most of the type is or can be drained by means of small open ditches.

Practically all of this soil is devoted to the production of corn and meadow grasses. Corn yields from about 15 to 30 bushels per acre without commercial fertilizer or manure. The soil is deficient in lime, and the application of one-half to 1 ton of lime per acre materially increases crop yields. The native meadow grasses are either

cut for hay or used for pasturage during the greater part of the year. This type is held in connection with the adjoining upland soils.

Results of mechanical analyses of samples of the soil and subsoil are given below:

Mechanical analyses of Wehadkee silt 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.*
233413	Soil	0.5	2.0	1.2	2.9	2.8	70.8	19.4
233414	Subsoil	1.1	1.5	.8	1.8	2.7	61.1	30.9

MISCELLANEOUS MATERIAL.

MEADOW (CONGAREE MATERIAL).

Meadow (Congaree material) comprises low-lying areas along some of the creeks and their branches. The soil has a wide range both in color and texture. It varies in color from brown to reddish brown and even red, and in texture from fine gravel to medium and fine sand and silt. The silt loam areas have the characteristics of the Congaree silt loam. A large part of this soil is poorly drained, and has a mottled dark-brown and gray or bluish-drab subsoil. Mica flakes are distributed throughout the 3-foot section.

The surface of this soil is almost level. It has a gentle slope toward the stream and in the direction of flow. Most of it is subject to overflow during periods of heavy rainfall, and open ditches are necessary to drain the larger areas.

The material mapped as Meadow (Congaree material) is alluvial. It has been washed from the surrounding soils during heavy rains and deposited by the streams along their courses during periods of overflow.

The native vegetation on this soil consists of a rank growth of willow, birch, sweet gum, and a variety of aquatic plants. Owing to the rather luxuriant plant growth large quantities of organic matter have accumulated, and as a result the larger areas are naturally highly productive.

On account of poor drainage conditions this land is used only to a small extent, except for hay land and pasture. Practically all the areas mapped as Meadow (Congaree material) can be reclaimed, largely by deepening and straightening the stream channels.

ROCK OUTCROP.

Rock outcrop comprises bare exposures of rock, mainly granite, varying in size from a fraction of an acre to about one-fourth square mile. In the crevices of the rocks there is a scrubby growth of trees,

principally oak and hickory, but no merchantable timber. Rock outcrop is nonarable and unfit for crop production.

In many places this rock is quarried and used for building stone. In color it ranges from light gray through gray and pink to dark gray. The most valuable rock commercially has a uniformly medium texture, though some of the outcrops are decidedly coarse grained. The dominant minerals entering into the composition of this granite are quartz, orthoclase feldspar, hornblende, and mica.

The largest and most important area of Rock outcrop occurs on Dunns Mountain, near Granite Quarry. Quarrying is carried on extensively here, the stone being used for building purposes, in the construction of dams, and for curbstones, paving blocks, fence posts, and millstones. A number of smaller areas of Rock outcrop occur in the vicinity of Faith, Granite Quarry, and Rock Grove Church.

SUMMARY.

Rowan County is situated in the west-central part of North Carolina. It has an area of 516 square miles, or 330,240 acres.

The surface is prevailingly rolling. Along the streams there are narrow strips having a nearly level surface, while in some sections of the county there are high hills, locally called "mountains." The greater part of the county, however, consists of broad interstream areas having an undulating to rolling surface. A drainage divide crosses the southern part of the county. North of this the creeks flow north or northeast into the South Yadkin and Yadkin Rivers.

The first settlements in Rowan County were made in 1720. The population of the county is reported in the 1910 census as 37,521. The population of Salisbury, the largest town and county seat, is given as 7,153. Spencer and East Spencer are towns locally important.

The transportation facilities are good. A main line of the Southern Railway and three branches of this system traverse the county. The public highways are generally good.

The climate of Rowan County is mild and healthful. The rainfall is adequate for crop production, and is well distributed throughout the year. The mean annual temperature is about 60° F. The mean annual precipitation is nearly 48 inches. There is a normal growing season of 195 days.

The principal crops grown in Rowan County are corn, wheat, cotton, oats, cowpeas, and clover, and crops of secondary importance, grown mainly for home use, are sorghum, Irish potatoes, sweet potatoes, garden vegetables, and tree fruits. Dairying is engaged in near Salisbury and Spencer. The quantity of pork and beef produced is not sufficient to supply the local demand.

The average size of the farms in the county is given in the 1910 census as about 90 acres. About 92 per cent of the land area is in farms, and about one-half the land in farms is improved. Sixty-two per cent of the farms are operated by the owners. Farm land ranges in value from $20 to $125 an acre.

Rowan County includes a great variety of soils, adapted to a wide range of crops. The upland soils are derived through processes of weathering from the rocks of the "Carolina Slate Belt" and from crystalline rocks, including granites, gneiss, diorite, and gabbro. The bottom soils occurring along the streams are of alluvial origin, the material having been washed from the surrounding hills and deposited along the streams during periods of overflow.

The Cecil soils are the most important in the county. The heavier types of this series, together with the Alamance and Georgeville series, are best suited to the production of grain and clover. The gravelly and sandy loam members of the Cecil series and the Appling and Durham types are good soils for the production of cotton, peanuts, sorghum, sweet potatoes, fruits, and vegetables.

The Iredell fine sandy loam and loam are fair soils for grains and grasses, and considerable cotton is grown on some areas of the former.

The Mecklenburg series is represented by one type, the clay loam, which is a good corn, wheat, and clover soil.

The fine sandy loam is the only member of the Wickham series and the only second-terrace soil found in the county.

The Congaree series is represented by three types, the fine sand, fine sandy loam, and silt loam. These soils are devoted to corn, oats, melons, and grass. They are not extensive.

The Wehadkee silt loam is encountered along a few streams in the eastern part of the county. Practically all of it is used for corn and grass.

Small strips of alluvial and colluvial material are mapped as Meadow (Congaree material). This land is in grass for pasturage and hay.

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