

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE,
W. A. GRAHAM, COMMISSIONER; B. W. KILGORE, STATE CHEMIST AND
DIRECTOR OF AGRICULTURAL EXPERIMENT STATION;
C. B. WILLIAMS, AGRONOMIST.

SOIL SURVEY OF WILKES COUNTY,
NORTH CAROLINA.

BY

R. C. JURNEY, OF THE U. S. DEPARTMENT OF AGRICULTURE, IN
CHARGE, AND S. O. PERKINS, OF THE NORTH CAROLINA
DEPARTMENT OF AGRICULTURE.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

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



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1921.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., June 28, 1920.

SIR: I have the honor to transmit herewith the manuscript report and map covering the soil survey of Wilkes County, N. C., and to recommend that they be published as advance sheets of Field Operations of the Bureau of Soils, 1918, as authorized by law. This work was done in cooperation with the North Carolina Department of Agriculture.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. E. T. MEREDITH,
Secretary of Agriculture.

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MAP.

Soil map, Wilkes County sheet, North Carolina.

SOIL SURVEY OF WILKES COUNTY, NORTH CAROLINA.

By R. C. JURNEY, of the U. S Department of Agriculture, In Charge, and
S. O. PERKINS, of the North Carolina Department of Agriculture—Area
Inspected by W. EDWARD HEARN.

DESCRIPTION OF THE AREA.

Wilkes County lies in the northwestern part of North Carolina, about 50 miles by rail west of Winston-Salem. The county is irregular in outline, its boundaries following, for the most part, the crests of ridges. It comprises an area of 735 square miles, or 470,400 acres.

Wilkes County lies in the Piedmont and the Appalachian provinces, and ranges in topography from an elevated plateau, dissected and eroded by numerous stream valleys, to typical mountains. The Piedmont Plateau extends southwesterly from the eastern border across the county. It is widest in the eastern section and tapers gradually to a width of a few miles in the southwestern corner. Its elevation above sea level ranges from 1,000 to 1,500 feet. Numerous streams have eroded this plateau, resulting in a wide range of topographic features, from undulating or gently rolling to steep, hilly, and broken. The more prominent undulating to rolling areas occupy the ridges north of Ronda, Roaring River station, and Northwilkesboro, west of Boomer, and in the southeastern part of the county near the Yadkin County and Iredell County lines. The steep and broken topography occurs along the Yadkin River and many of the smaller streams. Within the Piedmont section there are several knobs and low mountains with steep slopes, the most conspicuous of which are Wells Knob, Round Mountain, Owen Knob, and Gill Mountain.

Mountainous country encircles the southern, western, and northern parts of the county, and comprises about one-half its area. The Brushy Mountains, which traverse the southern part, occupy a belt from 1½ to 6 miles wide. They range in elevation from 1,500 to 2,500 feet above sea level, and are deeply dissected by narrow valleys and ravines. The slopes vary from gentle to steep and the ridge tops are narrow but comparatively smooth. There are a few well-rounded knobs.

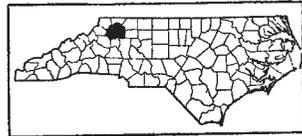


FIG. 1.—Sketch map showing location of the Wilkes County area, North Carolina.

The foothills of the Blue Ridge extend through the western and northern parts of the county, forming a transition zone between the Piedmont section and the Blue Ridge proper. This belt has an average width of about 7 miles, with elevations ranging from 1,500 to 2,500 feet above sea level. The topography is prevailingly steep and broken, and the ridge crests are narrow and sharp, with only a few smooth areas. The valleys are deep and narrow.

The Blue Ridge crosses the extreme northern part of the county, extending from Roaring Gap in a generally westerly direction to Tomkins Knob. This mountain range attains a width in the county of one-half mile to 3 miles and an elevation of 3,000 to 4,000 feet. The most important peak is Tomkins Knob, with an elevation of 4,000 feet. Stone Mountain is a massive outcrop of granite, rising 2,500 feet above sea level. The Blue Ridge is the source of many of the large streams of the county, and the slopes are steep and broken. Along the crest, however, there are a few narrow, smooth areas.

Adjacent to the rivers and creeks are strips of first and second bottoms, ranging in width from a rod or two to one-half mile. The surface of the bottom lands is level, except for a few narrow sand bars and ridges.

In elevation above sea level Wilkes County ranges from 1,000 feet in the extreme eastern part to 4,000 feet in the extreme western part. Most of the county lies between 1,000 and 2,500 feet. The general slope is eastward.

The main drainage outlet of the county is the Yadkin River, which enters in the southwestern part and flows northeastward across the county. Most of the tributary streams rise within the county. Many small creeks and branches extend to all parts of the county, and every farm has outlet to one or more. The county as a whole is adequately drained, and on the steep hillsides and cleared mountain slopes the drainage is excessive. The streams have trenched their valleys deeply, from 100 to 500 feet below the general upland level. They are swift flowing and are actively deepening their channels. Water power from the numerous streams is used in running grist mills and sawmills. There are many rapids and falls which could be used for the development of power.

Wilkes County was formed in 1777, from part of Surry County. Wilkesboro, the county seat, was founded in 1778. In 1740 there were only a few white settlers, but about 1750 three streams of immigrants began to flow into this territory, one from southeastern Pennsylvania, another from eastern North Carolina, and a third from South Carolina. Most of the settlers came from eastern North Carolina, and were of English descent. Moravians from Salem, N. C., were probably the first to explore the region, in search of potters'

clay, but only a few remained as permanent settlers. The first settlements were made around Wilkesboro and Northwilkesboro, where certain areas were found clear of timber and supporting a growth of grass suitable for grazing. Settlements later extended to the rich bottom lands along the river.

The population of Wilkes County in 1910 was 30,282, all of which is classed as rural, an average of 41.2 persons to the square mile. The present population consists largely of descendants of the early settlers. There are no foreigners and a relatively small number of negroes. The distribution of the population varies to some extent with the character of the soils and the topography. The Piedmont section is more uniformly settled, while the mountain sections are sparsely populated, except along the bottom lands.

Northwilkesboro is the largest town in the county, with a population of 1,902 in 1910. It is the chief trading center of the county and a shipping point for large quantities of produce and lumber. Wilkesboro, the county seat, has a population of 799. Other towns, with their populations, are: Ronda, 250; Roaring River, 100; Moravian Falls, 75; Elkville, 70; and Traphill, 100.¹

Railroad facilities are good in a belt across the south-central part of the county. A branch line of the Southern Railway extends along the Yadkin River from Northwilkesboro, connecting with the main line at Greensboro, N. C. The Watauga & Yadkin River Railroad follows the Yadkin River from Northwilkesboro to Darby, in the western part of the county. The Elkin & Alleghany Railroad touches the northeastern border of the county. The northern and southern mountainous parts of the county have no railroad facilities.

Public roads extend to all parts of the county. Several miles of graded roads have been built, and others are in progress. Most of these roads radiate from Northwilkesboro, and they are largely confined to the Piedmont section. These graded roads are good during dry seasons, but nearly all the other roads are in poor condition throughout the year.

Telephone lines connect practically all sections of the county. Mail delivery routes serve most of the country districts, and in addition there are post offices in convenient places throughout the mountainous areas. Schools and churches are well distributed throughout the county.

Northwilkesboro is the chief market and distribution point for the products of the county. Apples, canned and dried fruits, canned vegetables, herbs, and poultry and dairy products are shipped to various points in this and other States. Elkin, situated about a

¹ Since this report was written the preliminary announcement of the population of Wilkes County and its civil divisions in 1920 has been issued by the Bureau of the Census, as follows: Wilkes County, 32,644; rural, 32,644; Northwilkesboro, 2,363; Wilkesboro, 814. Rural population per square mile, 44.4.

mile outside the county, is the chief tobacco market, and it is also a distributing point for other products grown in the eastern part of the county.

CLIMATE.

According to the records of the Weather Bureau station at Brewers, Wilkes County has a mean annual temperature of 56.7° F. The winter mean is 38.6° and the summer mean 73.9°. The highest recorded temperature is 100°F., which has been recorded in June, July, and August, and the lowest is -9°F., recorded in February. The date of the latest recorded killing frost in the spring is May 14, and that of the earliest in the fall, October 2. The average date of the last killing frost in the spring is April 21, and the first in the fall, October 16. This gives an average growing season of 178 days.

The average annual rainfall amounts to 55.65 inches, which is sufficient for the production of all the common crops. The precipitation is well distributed throughout the year, being heaviest in the summer, with an average of 17.96 inches, and lightest in the fall, with an average of 11.66 inches. The total rainfall for 1904, the driest year on record, was 43.37 inches, and for 1901, the wettest year, 81.93 inches. There is much snowfall, but in some winters the fall is light. Heavy fogs are frequent along the rivers and on the mountain slopes.

The water supply of Wilkes County is abundant. There are many springs in all parts of the county, and the quality of the water is first class.

The following table, which shows the normal monthly, seasonal, and annual temperature and precipitation, is compiled from the records of the Weather Bureau station at Brewers. This station is situated in the northeastern part of the county.

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

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904.)	Total amount for the wettest year (1901.)
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	39.3	76	1	4.40	3.26	11.05
January.....	38.9	76	2	3.54	2.50	3.29
February.....	37.7	74	-9	4.13	2.95	1.48
Winter.....	38.6	76	-9	12.07	8.71	15.82
March.....	48.0	93	5	5.42	3.39	6.22
April.....	54.8	94	20	4.10	1.57	9.21
May.....	65.2	99	28	4.44	5.86	11.84
Spring.....	56.0	99	5	13.96	10.82	27.27

Normal monthly, seasonal, and annual temperature and precipitation at Brewers—Con.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904).	Total amount for the wettest year (1901).
	° F.	° F.	° F.	Inches.	Inches.	Inches.
June.....	71.9	100	38	6.65	8.70	9.61
July.....	75.4	100	44	5.27	5.18	5.81
August.....	74.5	100	43	6.04	5.13	15.29
Summer.....	73.9	100	38	17.96	19.01	30.71
September.....	69.1	98	30	4.61	1.20	4.87
October.....	58.9	92	20	4.39	.03	2.04
November.....	48.8	85	11	2.66	3.60	1.22
Fall.....	58.9	98	11	11.66	4.83	8.13
Year.....	56.7	100	-9	55.65	43.37	81.93

AGRICULTURE.

Agriculture in Wilkes County began about 1750, and has remained the chief industry to the present time. At first farming was confined mainly to the upland and bottoms near Wilkesboro, the early crops consisting of cotton, flax, corn, rye, and fruits. Hogs, sheep, and cattle were grazed in the woods, where a species of wild pea furnished pasturage until cold weather. Cattle raising was an important industry just prior to the Civil War, but it was later greatly neglected. Sheep raising also was a profitable pursuit at one time, but it was discontinued when the stock law was enacted, a few years after the Civil War. Fruits have been an important product of the county for many years.

The following table gives the acreage of the principal crops at each of the census years from 1880 to 1910:

Acreage of principal field crops, Wilkes County, 1880 to 1910.

Crop.	1880	1890	1900	1910
Corn.....	34,865	40,760	44,466	44,281
Oats.....	8,240	8,131	4,876	1,586
Wheat.....	9,515	11,924	15,998	14,288
Rye.....	5,236	4,914	2,074	5,478
Buckwheat.....	218	19	187	564
Cowpeas.....			565	578
Irish potatoes.....		707	584	855
Sweet potatoes.....	268	360	456	497
Tobacco.....	110	59	167	268
Sorghum.....		547	589	694

At the present time agriculture in Wilkes County consists of the production of general farm crops, mainly for home consumption. Corn is the most important crop. In 1909 it was grown on 44,281 acres and produced 608,666 bushels. Practically all the corn is fed to work stock on the farms, or ground into meal for home use. Part of the crop is sold at the local mills or traded for supplies at the country stores. The blades and tops are used as roughage. Corn is occasionally grown for ensilage.

The second most important crop is wheat. In 1909 there were 14,288 acres in wheat, producing 96,349 bushels. The crop is used mainly in making flour for home consumption, the bran being fed to the stock. A part of the production is sold. Rye in 1909 occupied 5,478 acres and produced 29,651 bushels. Practically all of this crop is consumed on the farm, partly in the form of flour and partly as hay and grain for stock. In 1909 there were 564 acres in buckwheat, producing 4,520 bushels. It is grown mainly in small patches in the mountain section and ground in local mills for home use. There were 1,586 acres in oats in 1909, producing 12,805 bushels. Oats are grown for feeding work stock.

Vegetables occupied a total of 1,463 acres in 1909. The principal crops in this class are tomatoes and beans, which are canned on the farms and sold at Northwilkesboro. Canning is a quite well-developed industry on farms throughout the county, and is a source of considerable income. The value of the vegetables produced in 1909 amounted to \$154,634. On nearly every farm there are patches of sweet potatoes, Irish potatoes, turnips, cabbage, and sorghum. These products are consumed mainly on the farms, but small quantities are sold at the local markets.

Tobacco was planted on a total of 268 acres in 1909, and gave a production of 133,267 pounds. Most of the acreage in this crop is in the extreme eastern part of the county.

Fruit growing is an important industry in this county. It consists mainly in the production of apples. In 1909 there were 275,196 apple trees in the county. The production in that year amounted to 284,962 bushels. In addition to small orchards on nearly every farm, there are several large commercial orchards. A considerable proportion of the production of home orchards is canned or dried and sold. There are several large, improved peach orchards in the county, the fruit from which is sold locally or shipped. In 1909 the county produced 24,695 pounds of nuts, chiefly chestnuts from the mountain districts. The value of the fruit and nut crops in 1909 was \$81,414.

Blackberries grow wild, and large quantities are canned and marketed each year. A great variety of medicinal herbs and plants grow in the forests, and large quantities of roots, bark, and leaves

are dried and sold at Northwilkesboro. Lumber, crossties, tan-bark, and acid-extract wood (chestnut), are important forest products sold in large quantities annually.

Stock raising is of little commercial importance in Wilkes County. Practically every farmer keeps one or more milk cows and enough hogs to supply meat for the home, but comparatively few raise cattle for sale. There are two or three dairy farms in the county. In 1909, according to the census, 1,538 calves and 3,482 other cattle were sold or slaughtered. Considerable beef is sold at Northwilkesboro and Elkin. In 1909 there were 11,019 hogs sold or slaughtered. The cattle are of Jersey, Hereford, or mixed breeds, and the hogs are of improved stock. Only a few sheep are kept in the county. The value of all animals sold or slaughtered in 1909 was \$306,746. Considerable butter is made on the farms and sold at the local markets. The value of all dairy products, excluding those used in the home, amounted to \$105,112 in 1909. Practically every farmer keeps chickens, and large quantities of poultry and eggs are sold annually at Northwilkesboro for shipment to northern markets. The value of the poultry and eggs produced in 1909 was \$185,468.

Some attention is given by the farmers to the natural adaptation of soils to certain crops. It is recognized that the Congaree fine sandy loam and silt loam are the best corn soils. The Cecil loam and clay loam are considered good wheat and corn soils, and the Porters stony loam and loam as excellent orchard soils. The Durham coarse sandy loam and the Cecil fine sandy loam are known to be well suited to the production of tobacco.

Wheat land is broken and harrowed in September or the first part of October. The seed is usually drilled in during October, although on the rougher areas it is sometimes broadcasted. The crop is harvested in June, with reapers, or on the steeper slopes with cradles. It is shocked in the field and later thrashed by machines which travel from farm to farm. The toll for thrashing is one-twentieth of the wheat handled.

Corn land is usually broken rather deeply in the spring, and the seed is planted in April or May, or as soon as the danger of frost is over. The crop is given four or five shallow cultivations during the summer. The fodder is pulled and the tops cut when the blades begin to turn slightly brown. The ears are usually left on the stalk until after frost, when they are hauled to the barn, husked, and stored in cribs. Corn on the upland is usually planted in rows 3 to 4 feet apart, while on the bottom lands the rows are 2 to 3 feet apart. On the steeper mountain slopes the crop is cultivated with hillside plows or hand hoes.

Some of the farmhouses in this county are large and substantial, and the barns in general are adequate. The fences consist mainly

of barbed wire, although many rail fences are in use. The farm equipment is composed of light and heavy plows, hillside plows, harrows, drills, reapers, cradles, and cultivators. Some of the better farms have disk plows, disk harrows, lime distributors, rollers, and riding cultivators. There are a few silos in the county. The work stock is composed of both horses and mules, but mainly the latter. In the mountain sections oxen are used to a great extent as work stock.

No general system of crop rotation is followed in this county. Many of the farmers plant cowpeas in the corn at the last cultivation, following these with wheat. Others sow cowpeas in the wheat stubble, and the following year plant corn. Wheat and corn are alternated by many farmers. In the mountain section buckwheat is frequently seeded on wheat land in the summer. Rye is grown to some extent as a cover crop to protect the soils, and clover and soy beans are occasionally grown as soil-improving crops.

According to the census, 2,804 farms used commercial fertilizer in 1909, at a total expenditure of \$39,919, an average of \$14.24 each. The fertilizer in most general use is 16 per cent acid phosphate, and from 100 to 200 pounds is the usual acreage application for wheat and corn. The complete fertilizers in most general use analyze 8-2-2,² 9-2-2, or 10-2-2, and the acreage application for wheat and corn ranges from 100 to 200 pounds. Tobacco is usually given an acreage application of 300 to 400 pounds of an 8-2-2, 8-3-3, or 10-3-4³ fertilizer. Nitrate of soda is used by a few farmers on wheat and corn. Crops on the bottom lands are rarely fertilized, and much of the corn on the upland receives no fertilizer. Stable manure is used, when available, on wheat and corn, and cowpeas, soy beans, and clover are grown by some farmers to increase the nitrogen content of the soils.

According to the 1910 census, 1,906 farms used hired labor in 1909, at a total outlay of \$70,677, or an average of \$37.08 each. The farm laborers are mostly white. Women and children do considerable farm work. Farm labor is rather scarce, having been attracted to the factories and mills in nearby counties. The daily wage is \$1 to \$1.25, while men employed by the month receive \$20 with board and \$30 without.

There was a total of 5,233 farms in Wilkes County in 1910, of an average size of 78.6 acres. The average number of improved acres to the farm is 28.4. Most of the farms range in size between 20 and 200 acres, but there are individual holdings, mainly of timberland, containing 1,000 acres or more. The 1910 census reports 74.6 per cent of the farms operated by owners, 25.1 per cent by tenants, and

² Eight per cent acid phosphate, 2 per cent nitrogen, 2 per cent potash.

³ Owing to shortage of potash, farmers have been using recently mixtures carrying nitrogen and phosphoric acid only.

0.3 per cent by managers. The tenanted farms are rented mainly on the share basis.

Land values depend largely upon topography, the timber, the improvements, and the nearness to towns and railroads, and range from \$10 an acre for the steep and broken land to \$200 an acre for improved land near Northwilkesboro. The average farm land is held at \$25 to \$50 an acre.

SOILS.

Wilkes County comprises about equal parts of the Piedmont Plateau and of the Appalachian Mountain and Plateau provinces. The soil material from which the soils of the county have been developed was accumulated in place by the disintegration and decomposition of the country rock, but along the streams there are narrow strips of soils derived from materials washed from the uplands. The underlying rock formations of the county consist chiefly of mica schist, granite, gneiss, and mica gneiss, together with some garnetiferous schist, talc schist, and dark trap rock. The rocks in the mountain regions have not weathered very deeply, and bedrock is usually encountered 24 to 36 inches below the surface, with many rocks outcropping as ledges or boulders. On the Brushy Mountains angular fragments are scattered over the surface or embedded in the soil. In the Piedmont section, except on the steep slopes, the rocks have weathered to a depth of 30 inches or more.

The underlying rocks of the county are mostly fine grained, and the soils are prevailingly loam or fine sandy loam in texture. On many of the steeper slopes, where erosion has been active, the surface material is a clay loam. The rocks carry more or less iron-bearing minerals, and the thorough oxidation of the iron compounds has imparted a red color to many of the types.

The soils are grouped in series, each series including types similar in color, structure, origin, and other characteristics. The soil types, or the members of the series, are separated on the basis of texture.

The Piedmont province is represented by four series, the Cecil, Davidson, Appling, and Durham, and the Appalachian Mountain and Plateau province by four series, the Porters, Talladega, Chandler, and Ashe. The alluvial soils are correlated in the Altavista and Congaree series. Riverwash, Meadow, Rough stony land, and Rock outcrop are miscellaneous types.

The surface soils of the lighter members of the Cecil series are pale yellow to yellowish brown in color, and the subsoils are invariably red in color and heavier in texture than the soils. Numerous fragments of vein quartz and a perceptible amount of sharp quartz sand are characteristic of the subsoil. Mica flakes also are usually present in small quantities. The heavier areas of this series are

locally called "red clay land." The Cecil soils are derived from those igneous and metamorphic rocks of the region which contain a moderate to high percentage of the dark-colored iron-bearing rock-making minerals and constitute the maturely developed soil of the region. The rock has been disintegrated to considerable depths and is rarely exposed in outcrops. These are the most important and widely distributed soils of the Piedmont Plateau.

The Davidson series is characterized by a dark-brown to reddish-brown surface soil and a deep-red or maroon, smooth, friable clay subsoil. The soils are derived from diorite and dark-colored trap rock.

The types of the Appling series have grayish to pale-yellow surface soils and mottled or streaked red and yellow or yellowish-red subsoils. Grayish or drab colors also occur occasionally in the subsoil. The Appling soils are derived chiefly from schist and gneiss.

The Durham series is characterized by the grayish color of the surface soil and the yellow color of the subsoil. It is derived from light-colored, rather coarse-grained granite and gneiss.

The Porters series is characterized by the brown or reddish-brown to red color of the surface soil and by its red to brownish-red, moderately friable clay subsoil. The members of this series are derived from granite, gneiss, mica gneiss, hornblende schist, and mica schist. It occurs in the mountain section of the county and is the equivalent of the Cecil series of the Piedmont region. There seems to be little or no difference between it and the corresponding members of the Cecil series.

The surface soils of the types grouped in the Talladega series are brown or reddish brown to red, and the subsoil is brownish red to red. The series differs from the Porters principally in its slightly less compact soil and subsoil, and in the high content of mica, which gives both soil and subsoil a decidedly greasy feel. The Talladega soils are derived mainly from mica schist.

The Chandler series is made up of types with yellow or brownish-yellow surface soils and yellow to reddish-yellow subsoils. Both surface soil and subsoil carry sufficient mica to have a greasy feel and a lustrous appearance. The Chandler series is derived chiefly from micaceous schists.

The surface soil of the members of the Ashe series is light brown to yellowish, and the subsoils are a yellow or brownish-yellow to reddish-yellow, friable clay. The Ashe soils are derived from granite, gneiss, mica gneiss, and garnetiferous schist.

The types belonging in the Altavista series have gray surface soils and yellow or mottled yellow and gray, or yellow, gray, and red subsoils. They are developed as well-defined to rather indistinct stream

terraces lying above normal overflow. Typically the material is alluvial, but in places near foot slopes some colluvial material has modified the deposits, and in other places the subsoil appears to be at least partly residual.

The surface soils and subsoils of the type classed in the Congaree series are brown to reddish brown, there being comparatively little change in texture, structure, or color from the surface downward. Occasionally grayish and yellowish mottlings are encountered in the subsoil of the poorly-drained areas. The Congaree soils are developed in the overflowed first bottoms of the Piedmont streams, and consist of alluvium from the Piedmont uplands with some admixture of Appalachian material.

In the following pages of this report detailed descriptions of the various soil types are given and their agricultural characteristics briefly stated. The distribution of the soils is shown on the map accompanying this report, and the following table gives the name and the actual and relative extent of each:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay loam	70,976	21.6	Ashe very coarse sandy loam	4,096	0.9
Steep phase	30,848		Congaree silt loam	4,032	0.9
Cecil loam	72,832	19.0	Durham coarse sandy loam	3,200	0.7
Steep phase	16,768		Ashe stony loam	2,368	0.5
Porters loam	78,784	16.7	Porters fine sandy loam	2,176	0.5
Porters stony loam	46,208	9.9	Talladega clay loam	2,048	0.4
Cecil fine sandy loam	26,752	5.9	Altavista fine sandy loam	2,048	0.4
Steep phase	1,088		Riverwash	1,728	0.4
Chandler loam	24,128	5.1	Appling sandy loam	1,664	0.4
Ashe loam	19,456	4.1	Porters clay loam	1,536	0.3
Talladega loam	18,240	3.9	Davidson clay loam	896	0.2
Cecil stony loam	11,136	2.4	Cecil coarse sandy loam	576	0.1
Congaree fine sandy loam	8,896	1.9	Rock outcrop	384	0.1
Rough stony land	6,080	1.3			
Cecil gravelly loam	5,824	1.2	Total	470,400
Meadow (Congaree material)	5,632	1.2			

CECIL STONY LOAM.

The surface soil of the Cecil stony loam is a gray to brown or reddish-brown loam or fine sandy loam, ranging in depth from 6 to 10 inches. The subsoil is a red, friable clay loam or clay. From 30 to 60 per cent of angular schist, quartz, or granite stones, and boulders, are scattered over the surface, and stones are often embedded in the soil and subsoil. They vary in diameter from 2 to 10 inches. The surface soil commonly carries a small quantity of quartz and schist gravel. On the steeper slopes the subsoil is ordinarily yellowish red, and the underlying rock in many places lies 20 to 30 inches below the surface.

The Cecil stony loam occurs in nearly all parts of the Piedmont section of the county. Rather large areas are mapped in the north-eastern part near Union School and Knob Church, in the southeastern part near Osbornville, in the southern part near Fishing Creek Arbor, Edgewood Church, and Moravian Falls, and in the western part near Pilgrimage Church. The type occurs on low knobs and mountains, at the foot of mountains, on the steep slopes adjoining streams, and to a small extent on smooth ridges. The topography ranges widely, from rolling to hilly or broken. On some of the ridges there are a few smooth areas. Owing to the surface relief the soil is well drained.

This is not an important agricultural type, only a small percentage of it being under cultivation. Some of the remainder is in pasture, but most of it is forested. The timber growth consists of various oaks and some hickory, sourwood, pine, and dogwood.

Corn is the principal crop, with yields of 15 to 30 bushels per acre. Wheat and rye are grown in small fields and the yields are low. Apples and peaches give good results, and there are a few small improved apple orchards. Limbertwig is the chief variety grown in these orchards.

The selling price of the Cecil stony loam depends largely upon the timber growth.

This soil is adapted to general farm crops, apples, and peaches. On account of the unfavorable topography and the stoniness it is rather difficult to cultivate, but a larger percentage of it could be readily used for pasturage or orcharding.

CECIL GRAVELLY LOAM.

The surface soil of the Cecil gravelly loam consists of a grayish-brown to brown loam, 6 to 10 inches deep, containing 25 to 50 per cent of angular quartz and schist gravel and a few quartz stones. The subsoil is a friable, red clay extending to 3 feet or more. The surface soil carries considerable fine sand in some places along the ridges. The subsoil contains some mica flakes, and often passes into the underlying rock at 30 to 60 inches.

This type is confined to the eastern part of the county and is of small extent. The largest areas occur near Burcham Mill, Pleasant Home Church, and Lomax. Smaller ones are mapped east of Brewers Store and Clingman. The type is encountered on ridges and on slopes adjoining streams, and is prevailingly undulating to rolling. Near some of the streams the surface is strongly rolling, but most of the type is situated in the smoothest section of the county. Owing to the loose, porous nature of the surface soil, the type is well drained.

This is an important agricultural soil, about 65 per cent of it being cultivated. The remainder is in forest, consisting mainly of oak,

hickory, and dogwood, with some sourwood, persimmon, and cedar. Corn and wheat are the principal crops. Cowpeas and rye are grown in a small way. Corn yields 10 to 35 bushels per acre, averaging about 15 bushels.

The chief fertilizer used for wheat is 16 per cent acid phosphate applied at the rate of 150 to 200 pounds per acre. A few farmers use acid phosphate for corn, but others do not fertilize the latter crop at all. The principal complete fertilizers used are 8-2-2 or 9-2-2, which are applied at the rate of 100 to 200 pounds per acre for wheat and corn. Stable manure is applied to the fields when available.

The land sells at \$20 to \$50 an acre, depending upon the state of improvement and the nearness to lines of transportation.

The Cecil gravelly loam is usually deficient in organic matter, and it would be greatly benefited by turning under green manuring crops or by adding stable manure. A rotation of crops which includes a legume would prove beneficial.

CECIL COARSE SANDY LOAM.

The surface soil of the Cecil coarse sandy loam is a gray to grayish-brown or reddish-brown, coarse sandy loam or loamy coarse sand, 6 to 10 inches deep. This is underlain by a friable, red clay subsoil which usually contains some mica flakes and particles of medium or coarse quartz sand. The subsoil typically extends to 3 feet, but granite bedrock is often encountered at 24 to 30 inches, and bowlders frequently appear on the surface. The type occurs in close association with the Durham coarse sandy loam, and near the latter type the subsoil is usually yellowish red.

The Cecil coarse sandy loam is confined largely to one area just south of Joynes, in the northeastern part of the county. The topography is gently rolling to rolling, and near some of the streams strongly rolling. Both surface run-off and internal drainage are good.

This is not an important type agriculturally. About 35 per cent of it is cultivated, and the remainder is forested with oak, hickory, dogwood, and pine. Corn and wheat are the principal crops. Corn yields 10 to 30 bushels per acre, and wheat 8 to 15 bushels. About the same fertilizer treatment is given as on the Cecil gravelly loam.

The selling price of the land ranges from \$20 to \$40 an acre, depending upon the value of the timber or the state of improvements.

The soil is low in organic matter, and green-manuring crops should be plowed under. Winter cover crops would help prevent surface erosion. This soil would produce a heavy grade of tobacco, and more of it could well be used for tobacco growing.

CECIL FINE SANDY LOAM.

The surface soil of the Cecil fine sandy loam is a light-gray to yellowish-gray, mellow fine sandy loam, 6 to 10 inches in depth, underlain by a pale-yellow, compact fine sandy loam or clay loam to a depth of 12 or 14 inches. The subsoil is a stiff, friable red clay, extending in most places to a depth of 3 feet or more. Frequently there is a stratum of reddish-yellow clay between the surface soil and the red subsoil. Finely divided mica flakes are usually present in small quantities in the soil and subsoil, and frequently decomposed granite rock is encountered at 30 to 36 inches. In some places angular quartz gravel and stones are scattered sparingly over the surface.

The Cecil fine sandy loam occurs principally in the southeastern and southwestern parts of the county. The largest areas are mapped near Clingman, New Castle, Lovelace, Osbornville, and Mount Pisgah Church, in the southeastern part, and near Mount Carmel Church and west of Boomer to the Caldwell County line, in the southwestern part. One rather large body occurs at Holbrook School, in the northeastern section of the county. The type occupies rather broad interstream positions, whose surface varies from undulating or gently rolling to rolling. The surface and internal drainage are good.

The Cecil fine sandy loam is one of the most important types in the county. Approximately 60 per cent of it is under cultivation. The wooded areas support a growth of oak together with some pine, hickory, dogwood, and cedar. The crops are mainly corn and wheat. Tobacco is produced to a small extent. Sweet potatoes, Irish potatoes, and sorghum are grown by some farmers chiefly for home consumption.

Corn yields range from 15 to 40 bushels per acre, averaging about 20 bushels. Wheat yields 8 to 20 bushels, averaging about 12 bushels. Tobacco yields 600 to 800 pounds per acre. For corn, 100 to 150 pounds of an 8-2-2 fertilizer or 16 per cent acid phosphate is applied. Wheat land usually receives 100 pounds per acre of 16 per cent acid phosphate. Many of the farmers do not fertilize corn. Tobacco ground is fertilized with 400 to 600 pounds per acre of an 8-2-3, 8-3-3, or 10-3-4 fertilizer.

Lime is applied by a few farmers to improve the soil, while others grow clover, cowpeas, or soy beans to increase the nitrogen content. Stable manure is applied when available. The soil as a rule is broken rather shallow.

Land of this type sells for \$20 to \$50 an acre, depending upon the state of improvements, the nearness to markets, and the timber growth.

The soil can be improved by plowing a little deeper each year and thoroughly pulverizing the soil; by turning under leguminous crops such as cowpeas or clover; and by applying liberal amounts of stable manure. Winter cover crops should be grown to prevent erosion on the slopes. A systematic rotation of crops would be beneficial. The type is well suited to the production of fine-textured tobacco, and the culture of this crop should be extended. More oats could well be grown as feed for work stock. There are large areas of this soil which should be cleared and cultivated, as it is one of the best types in the county.

Cecil fine sandy loam, steep phase.—The surface soil and subsoil of the steep phase are not materially different from those of the typical Cecil fine sandy loam, but the surface is generally too rough for farming. The underlying granite is often encountered 24 to 30 inches below the surface. Mica flakes are usually present in the soil and subsoil in small quantities.

The phase is of small extent. Most of it occurs southeast of Spurgeon and west of Mount Carmel Church. It occupies steep, broken areas on the breaks and slopes adjoining streams, and the drainage is good to excessive. Only a few small fields are under cultivation. There are a few areas in pasture and the remainder is forested, chiefly with oak. The selling price of the land depends largely upon the timber. This soil should in general be left forested, or if cleared it should be seeded to grass for pasturage.

CECIL LOAM.

The surface soil of the Cecil loam, locally called "white plains land," is a pale-yellow, brownish, or reddish-brown, mellow loam, 6 to 8 inches deep, underlain usually by a yellowish-red or brownish loam or clay loam, 12 to 16 inches in depth. The subsoil is a red, brittle clay extending to 36 inches or more, and frequently containing fine mica flakes. Small quantities of quartz and schist gravel occur over the surface, particularly along the ridges, and there is some quartz gravel in the subsoil. Angular quartz and schist stones are occasionally scattered over the surface. In wooded areas the first inch or two of the surface soil is light gray to almost white, while in some of the plowed areas the surface color is yellowish gray or yellowish red. The subsoil on some of the steeper slopes is yellowish red in color. The decomposed parent rock is frequently encountered at 30 to 36 inches, especially in the more rolling areas.

The Cecil loam is developed in practically all parts of the Piedmont section. The largest areas are mapped in the eastern and north-eastern parts, near Clingman, to the north of Ronda, Roaring River station, and Knottsville; along the Surry County line east and south-east of Traphill; in the vicinity of Abshers, Dehart, and Hay Meadow;

and in the western part of the county near Harmony Church, south of Pilgrimage Church, and around Beaver Creek Church. The type largely occupies interstream positions, although much of it occurs on slopes adjoining streams. The smoother areas are found near Clingman and on the ridges leading from Ronda and Roaring River station to the vicinity of Traphill. The surface of the type ranges from gently undulating to rolling or strongly rolling, and drainage is everywhere adequate. On some of the steeper slopes erosion is active and gullies are forming. The subsoil is retentive of moisture and crops do not suffer except in excessively dry seasons.

The Cecil loam is an extensive and important agricultural type. About 60 per cent of it is under cultivation. The remainder is forested mainly with oak, pine, hickory, dogwood, and sourwood. Some of the wooded and cleared areas are in pasture.

The most important crops on this soil are corn and wheat. These are grown mainly for home consumption, but small quantities are sold on the local markets. Snap beans and tomatoes are grown to a considerable extent, and are canned for market. Many farmers grow sweet potatoes, Irish potatoes, sorghum, cabbage and turnips for home consumption. Practically every farm has a few fruit trees, and some of the fruit is canned or dried for sale. In the eastern section of the county tobacco is produced in a small way as a cash crop.

Corn yields 10 to 35 bushels per acre; wheat 6 to 15 bushels, averaging about 10 bushels; and tobacco 500 to 700 pounds. Oats give rather low yields. Corn land is usually broken in the spring to a rather shallow depth, and the crop is given four or five shallow cultivations. The seed bed for wheat usually is poorly prepared.

The principal fertilizer used for corn and wheat is 16 per cent acid phosphate, applied at the rate of 100 to 300 pounds per acre. Complete fertilizers, analyzing 8-2-2 or 9-2-2, are used to some extent, at the rate of 100 to 200 pounds per acre. Tobacco receives 400 to 600 pounds of an 8-2-3 or 10-3-4 fertilizer. Some of the farmers grow cowpeas, clover, soy beans, or rye, to add nitrogen and organic matter to the soil.

The land sells at \$15 to \$50 an acre, depending upon the improvements, the timber growth, and the nearness to towns and railroads.

The Cecil loam is well adapted to corn, wheat, oats, tobacco, and leguminous crops. It is easily tilled and responds readily to any system of soil improvement. It is greatly deficient in organic matter and nitrogen. Green manuring can be depended upon to maintain the organic supply, and the growing of leguminous crops, such as cowpeas, clover, or soy beans, and the use of stable manure will supply nitrogen. Several old fields of this type have been reclaimed as good wheat and corn land by green manuring for two to three years

with cowpeas or rye. A rotation of crops, including a legume, would be beneficial. The growing of oats, as feed for work stock, and of tobacco, as a cash crop, could well be extended on this soil.

Deeper plowing and better preparation of the seed beds would increase the relatively low yields of corn, wheat, and oats. This soil easily washes or erodes, and winter cover crops should be grown as much as possible.

Cecil loam, steep phase.—The steep phase differs primarily from the typical Cecil loam in that the surface is so rough and broken that agricultural operations are confined to pasturage and forestry. The phase occurs in close association with the typical Cecil loam, along the steep slopes and breaks of streams. The largest areas are mapped along Roaring River and near the Yadkin River in the vicinity of Marley Ford, Goulds, and Ferguson. The phase is also encountered on Owen Knob and Gill Mountain. Smaller bodies adjoin many of the streams of the county. The topography is steep and broken, and the drainage is good to excessive.

The soil is unimportant agriculturally, only a few small fields being farmed. A smaller portion of the type is used for pasturage. Most of it is in the native timber, which consists mainly of oak, with some hickory, dogwood, sourwood, and cedar.

The selling price of this land is governed largely by the value of the timber. The phase should either remain in forest, or if cleared be used as pasture.

CECIL CLAY LOAM.

The surface soil of the Cecil clay loam is a red to reddish-brown loam or clay loam, 5 to 7 inches deep, underlain to a depth of 3 feet by a red, stiff, brittle clay, carrying small mica flakes. In wooded areas the surface 2 or 3 inches is usually a yellowish loam or heavy fine sandy loam. In places some angular quartz gravel and stones occur over the surface, and the decomposed bedrock is frequently encountered at depths ranging from 30 to 36 inches. Included in this type are some areas of Cecil loam too small to be shown on the map.

The Cecil clay loam is developed in nearly all parts of the Piedmont section of the county. Large areas are found in the eastern part near Ronda, Benham, and Traphill, and in the southern and western sections near Moravian Falls, Mount Carmel Church, Boomer, Hays Arbor, Purlear, and Elkville. The type occupies positions along the slopes and around the heads of streams, and ranges from undulating to rolling or strongly rolling. Surface drainage is well established, but the internal drainage is slightly retarded by the heavy subsoil, so that the type can not be cultivated as soon after rains as the other members of the series.

The Cecil clay loam is an important soil, about two-thirds of it being cultivated. Some areas are in pastures, and the remainder is forested with oak, pine, hickory, dogwood, and cedar. Corn and wheat are the most important crops. Oats, rye, Irish potatoes, sweet potatoes, and sorghum are grown to some extent. Fruit and vegetables are produced for home consumption, and small quantities are canned for market.

Corn yields 15 to 40 bushels per acre, and wheat 10 to 20 bushels. Oats, clover, soy beans, and cowpeas give good results. The principal fertilizer used is 16 per cent acid phosphate, which is applied to wheat and corn land at the rate of 100 to 200 pounds per acre. Fertilizers analyzing 8-2-2 or 9-2-2 are used by some farmers, the acreage application for corn and wheat being 100 to 200 pounds. Few farmers use lime to improve the soil. Cowpeas, clover, and soy beans are grown as soil improvers to some extent.

This land sells for \$15 to \$50 an acre, depending upon the improvements, the value of the timber, and the nearness to railroads and towns.

The Cecil clay loam is well adapted to wheat, oats, corn, export tobacco, and forage crops. It is capable of being built up and maintained in a high state of improvement. One of its chief needs is more organic matter, which can be supplied by plowing under green-manuring crops and stable manure. The mere growing of leguminous crops, such as cowpeas, clover, and soy beans, will help supply the soil with nitrogen. In some sections of the county yields of corn and wheat have markedly increased on land which had previously been occupied by leguminous crops. Systematic rotations should be more generally practiced on this soil. The growing of winter cover crops would largely prevent the soil from washing.

Cecil clay loam, steep phase.—The steep phase represents rough areas of Cecil clay loam which are unsuited for general-farming purposes. Disintegrated rock is usually encountered 24 to 36 inches below the surface. The first 2 or 3 inches of the surface soil is frequently a yellowish loam or heavy fine sandy loam, and the subsoil is sometimes yellowish red.

The steep phase is well distributed over the Piedmont section of the county, occurring in close association with the typical Cecil clay loam. The largest areas are mapped along the breaks to the Yadkin and Reddies River, while smaller bodies are encountered along other drainageways. The topography is steep, hilly, or broken, and drainage is excessive.

Little of this soil is cultivated, owing to the rough surface. Most of it remains forested, the growth consisting chiefly of oak, with some hickory, dogwood, sourwood, and cedar. Some areas are in pasture. The selling price of this land depends largely upon the timber.

DAVIDSON CLAY LOAM.

The surface soil of the Davidson clay loam is a brown to reddish-brown or red clay, 6 to 8 inches deep. The subsoil is a maroon-red, smooth, stiff, friable clay extending to 3 feet or more in depth. Scattered over the surface and embedded in the soil are a few quartz gravel. Stones in small quantities are occasionally found on the surface. The soil is derived from dark-colored trap rock.

The type is very inextensive in this county. Small areas are mapped west of Northwilkesboro, south of Purlear, west of Staunton, and at Covenant Church, with others elsewhere in the Piedmont section. The type occurs closely associated with the Cecil clay loam. Its topography is undulating to rolling, and drainage is well established.

The Davidson clay loam is unimportant agriculturally, on account of its small extent. About two-thirds of it is cultivated; the remainder supports a growth of oak, hickory, pine, and cedar. Corn and wheat are the principal crops, while clover is grown in a small way. Corn yields 20 to 40 bushels per acre, and wheat 10 to 20 bushels. Clover does especially well, and cowpeas and soy beans give good yields.

The principal fertilizer used for corn and wheat is 16 per cent acid phosphate, and the acreage application is about 200 pounds. Small amounts of lime are applied by a few farmers, with good results.

The price of this land is governed by the state of improvement and the nearness to towns and railroads. Selling values range from \$20 to \$100 an acre.

The Davidson clay loam is well suited to corn, wheat, oats, clover, soy beans, and cowpeas. In some counties alfalfa has been found to give good yields. The growing of green-manuring crops, together with deeper plowing, would be beneficial to this soil, and liming would also give good results.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam is a gray sandy loam, passing at 2 to 3 inches into a pale-yellow sandy loam, which extends to a depth of 10 to 15 inches. The subsoil is a reddish-yellow or mottled red and yellow, friable sandy clay or clay, extending to depths of 30 to 36 inches. There are occasionally some gravel and stones scattered over the surface, and the underlying parent rock is usually encountered at 30 to 36 inches. Included in the type are some areas of coarse sandy loam and fine sandy loam too small to separate on the map.

The Appling sandy loam is of small extent. Rather large areas are found near Hunting Creek post office, north of Covenant Church, and

1 mile east of Abshers, while smaller bodies are encountered elsewhere in the Piedmont section of the county. The type usually occurs on slopes adjoining streams; its surface is undulating to rolling. The natural surface and internal drainage are good.

This is an unimportant agricultural soil. About one-half of it is cultivated, and the remainder is forested with oak, pine, hickory, and cedar. The leading crops grown are corn and wheat. Cow-peas, rye, and soy beans are produced to a small extent, and there are a few small areas in tobacco. Corn yields 15 to 25 bushels per acre, wheat 8 to 10 bushels, and tobacco 600 to 800 pounds. The chief fertilizer used for wheat and corn is 16 per cent acid phosphate, which is applied at the rate of about 200 pounds per acre. Tobacco receives 400 to 600 pounds per acre of a 10-3-4 fertilizer.

The selling price of this land depends largely upon the timber and the price of the adjoining soils, with which it is usually sold.

The Appling sandy loam is deficient in organic matter, which can be supplied by turning under green-manuring crops and by applying stable manure. Deeper plowing would also prove beneficial. The type is adapted to corn, oats, rye, tobacco, and forage crops.

DURHAM COARSE SANDY LOAM.

The surface soil of the Durham coarse sandy loam, locally called "white land," is a light-gray to almost white, loamy coarse sand or coarse sandy loam, passing at 6 to 8 inches into a pale-yellow coarse sandy loam, which extends to 12 or 15 inches in depth. The subsoil is a yellow, friable coarse sandy clay, usually extending to a depth of 3 feet or more, but sometimes passing into disintegrated bedrock in the lower part of the 3-foot section. The surface soil is open and porous and frequently contains some small angular quartz gravel. The type is derived from light-colored granite, and boulders of this rock frequently occur over the surface. There are included with the type a few areas of Cecil coarse sandy loam, too small to show on the soil map.

The Durham coarse sandy loam is confined almost entirely to one large body immediately west of Traphill, in the northeastern part of the county. The topography is undulating to rolling, becoming strongly rolling near the stream courses, and owing to the porous nature of the soil and the rolling surface the type is well drained.

Although of relatively small extent, this soil is important agriculturally. About three-fourths of it is cultivated, the remainder supporting a growth of oak, hickory, and pine. Most of the type lies well for cultivation, and it is easily worked. The principal crops are corn and wheat. Tobacco is grown in a few small fields, and cow-peas, clover, rye, and vegetables are produced to a limited extent.

Corn yields 15 to 25 bushels per acre, and wheat 8 to 12 bushels, averaging about 10 bushels. Tobacco, cowpeas, clover, rye, and vegetables give good yields.

Corn and wheat receive an acreage application of 200 to 300 pounds of 16 per cent acid phosphate, or of an 8-2-2 or 9-2-2 mixture. The type responds readily to green manuring, and increased yields have been obtained in this way by some of the farmers. Others have increased yields by following a systematic rotation which includes a leguminous crop.

This land sells for \$20 to \$50 an acre, depending largely upon the state of improvement.

The Durham coarse sandy loam is admirably adapted to bright tobacco, and the culture of this crop could well be extended. The type is deficient in organic matter, which can be supplied by plowing under rye, cowpeas, or clover, or by applying barnyard manure.

PORTERS STONY LOAM.

The surface soil of the Porters stony loam is a reddish-brown, brown, or yellowish-brown loam to heavy fine sandy loam, 6 to 10 inches in depth. The subsoil usually begins as a yellowish-brown or yellowish-red clay but quickly passes into a red or reddish-brown, friable clay which extends to 3 feet in depth or passes into the decomposed parent rock at 24 to 36 inches. Scattered over the surface and mixed with the soil is an abundance of granite, gneiss, and schist fragments, ranging in diameter from 2 to 10 inches. There are also present on the surface and mingled with the soil considerable small, angular quartz and schist gravel. The subsoil usually carries small quantities of mica flakes. There are some variations in the color of the subsoil. In places it is light red, yellowish red, or brown.

The Porters stony loam is confined almost wholly to the southern part of the county, where one large body practically covers the entire extent of the Brushy Mountains. The type occurs principally on the slopes, but also on some of the smoother ridges. The topography ranges from gently sloping to steep and broken. Some of the smooth or gently sloping areas are found immediately west of Russell Gap, around Cove Gap, between Bud Lowe Gap and Hendren Mill, and north of Iron-Lithia Springs. There are also narrow, smooth areas along the ridge from Gilreath to Kennedy Store.

The surface run-off and internal drainage of this soil are good. The surface stones tend to hold the soil in place and prevent washing, and as a result the steeper slopes can be cultivated without causing erosion.

The Porters stony loam is one of the most extensive soils of the county, but less than 5 per cent of it is farmed or in orchards. The timber growth on the remainder consists of chestnut oak, red oak, white oak, chestnut, and some hickory, poplar, and maple. In places there is a dense undergrowth of mountain laurel and rhododendron. The principal agricultural industry is fruit growing. There are several large improved apple orchards, the chief varieties grown being the Limbertwig and the Virginia Beauty. The Royal Limbertwig, Winesap, and Queen are produced to a large extent. The Limbertwig is the main market variety. The color and flavor of the fruit are excellent, and the keeping qualities are good. The fruit matures in October and is stored in houses specially constructed to insure the proper degree of dryness or moisture, being marketed at the discretion of the grower. There are also a few improved peach orchards, which give good yields of a fine quality of fruit.

On account of its stoniness this soil is somewhat difficult to cultivate. Corn and wheat are produced to a small extent, and corn and rye are occasionally grown in the orchards. Corn yields 12 to 20 bushels per acre and wheat 6 to 8 bushels. Large quantities of tan bark, extract wood, crossties, and lumber are taken from the forests annually.

The selling value of the Porters stony loam depends in a large measure upon the timber growth.

This is one of the best orchard soils in the county, and more of it could well be used for the production of fruit for market.

PORTERS FINE SANDY LOAM.

The surface soil of the Porters fine sandy loam is a gray, yellowish-gray, or brown, mellow fine sandy loam, 6 to 12 inches in depth. The subsoil begins as a yellowish-red, friable fine sandy clay and passes immediately into a red, friable clay loam or clay which extends to 3 feet in depth. Both soil and subsoil usually carry a few mica flakes. Rock fragments are usually present on the surface in small quantities, and the underlying bedrock is frequently encountered at 30 to 36 inches in depth.

The Porters fine sandy loam is mostly confined to the Brushy Mountains. Rather large areas are mapped near Gilreath, 1 mile southeast of Fishing Creek Arbor, and 2 miles south of Antioch Church. The type also occurs in comparatively large bodies 1 mile north of Wilbar, and 1½ miles east of Hendrix. In general it occupies gently rolling to sloping positions on the crests of ridges, and drainage is well established.

This is an unimportant soil agriculturally on account of its small extent. About two-thirds of it is cultivated, and the remainder is forested with red oak, chestnut oak, white oak, and chestnut. The

type is used mainly for corn and wheat. Apples and peaches are produced to some extent for home consumption and for market.

Corn yields 15 to 30 bushels per acre, and wheat 8 to 10 bushels. Crops are given light applications of fertilizer, mainly 16 per cent acid phosphate. Stable manure is used when available.

Land of this type sells for \$20 to \$30 an acre, depending largely upon the state of improvement.

The farmed areas of this soil are deficient in organic matter, which can be supplied by plowing under green-manuring crops or by applying stable manure.

PORTERS LOAM.

The surface soil of the Porters loam is a brown, yellowish-brown, or reddish-brown, mellow loam, 6 to 12 inches deep. The subsoil is a red, reddish-brown, dull-red, or yellowish-red, friable clay loam or clay usually extending to a depth of 3 feet or more. In places, however, the decomposed bedrock is encountered at 24 to 36 inches, and ledges of this are occasionally exposed at the surface, especially on the steep slopes. Mica flakes are usually present in both soil and subsoil, but not in sufficient quantities to impart a greasy feel. There are occasionally present on the surface and embedded in the surface soil a few stone fragments. In the occasional coves the surface soil is darker than typical and extends to depths of 15 to 18 inches. Included with the type are a few areas of Porters stony loam too small to indicate on the soil map.

The Porters loam is confined mostly to the foothills of the Blue Ridge. Large areas are mapped on Carters, Widow, Chestnut, and Burke Mountains, in the vicinity of and north of Whittington, south of Shoe and Walsh, east and west of Staunton and Parsonville, on Laurel Spur, Dividing Ridge, and Elk Ridge, and on Greasy and Smith Walker Mountains. Smaller areas are found on the Brushy Mountains. The type occupies mountain slopes, and is steep and broken, but with a few smooth areas in the vicinity of Cane Creek Church, Mertie, Oak Grove Church, immediately south of Summit, on McInnis Mountain, and in places on the Brushy Mountains. The type is well drained, and occasionally on the steeper slopes the run-off is excessive.

This is one of the most extensive types in the county, but less than 5 per cent of it is cultivated. The remainder supports a forest growth consisting of chestnut oak, red oak, white oak, chestnut, maple, poplar, and pine. There is in places a thick growth of mountain laurel and rhododendron and a variety of medicinal herbs grow on the type. A few small areas are devoted to pasturage.

Corn, wheat, and buckwheat are the leading crops on this soil. Corn yields 20 to 25 bushels per acre, and wheat 8 to 15 bushels. Buckwheat is grown in small patches and gives good yields. Apples

are produced for home use on most farms, and there are a few small improved commercial peach and apple orchards. The color and quality of the fruit are fine. Irish potatoes, turnips, and cabbage are grown for home use and occasionally for sale. Chestnuts and herbs are gathered from the forest for sale. Tan bark, acid extract wood, crossties, and lumber are important forest products. Crops on this soil are rarely fertilized, but stable manure is applied whenever available.

The selling price of the farmed areas ranges from \$30 to \$100 an acre, and that of the wooded areas from \$4 to \$30, depending upon the timber.

The Porters loam is prevailing too steep and broken for general farming, but more of it could well be devoted to apple or peach orchards. Larger areas could also be used as pasture for cattle and sheep. Most of the type should remain in forest.

PORTERS CLAY LOAM.

The surface soil of the Porters clay loam is a reddish-brown to red clay loam, 5 or 6 inches in depth. The subsoil is a red or reddish-brown, friable clay loam or clay, extending to a depth of 3 feet. Fine mica flakes are usually present in small quantities in the subsoil. Occasionally there are a few stone fragments on the surface.

The Porters clay loam is of small extent, being confined to a few small areas in the Brushy Mountains and along the foothills of the Blue Ridge. Some of these areas are mapped west of Lewis Fork Church, north of Maplesprings, and near Mount Zion Church and Parsonville. The type occurs at the foot of mountains, near streams and around the heads of streams. The surface ranges from rolling to steep, and drainage is excessive in most places.

This is not an important agricultural soil, on account of its small extent. Most of it is cultivated or in pasture. A small portion is timbered. Corn and wheat are the principal crops. Corn yields 15 to 25 bushels per acre, and wheat 8 to 10 bushels. Some buckwheat is grown and the crop gives good results. Apples, Irish potatoes, cabbage, sorghum, and turnips give good yields, and are grown for home use.

The land sells for \$20 to \$30 an acre, depending upon the state of improvement.

The Porters clay loam is subject to erosion, and cover crops should be grown. The addition of organic matter and deeper plowing would prove beneficial.

TALLADEGA LOAM.

The surface soil of the Talladega loam is a yellowish-red, brown to reddish-brown, loose, smooth loam, ranging in depth from 6 to 10 inches, and carrying a noticeable amount of mica scales. The sub-

soil is a light-red or yellowish-red, friable clay loam or clay, which may extend to a depth of 3 feet or more but usually grades into decayed rock at depths between 2 and 3 feet. In some places the rock comes to the surface. There is present in the subsoil a sufficient amount of finely divided mica flakes to give a slick greasy feel. The soil is derived from mica schist and mica gneiss.

The Talladega loam is relatively extensive, although it is confined largely to the northern and western parts of the county. Large areas are mapped east and west of Springfield, and in the vicinity of Mount Zion, Harley, and Summit. Smaller bodies are found elsewhere in the foothills of the Blue Ridge. The surface in general is steep and broken, but there are a few smooth areas near Summit and Pattons Ridge Church. The type occupies steep slopes and sharp ridges of mountains, and the drainage is good to excessive.

This is an unimportant agricultural soil, only about 5 per cent of it being cultivated. Its topography is too steep and broken for farming, and most of the type remains in forest, consisting of chestnut oak, red oak, hickory, and chestnut. The principal crops grown are corn, wheat, and buckwheat. Corn yields 15 to 25 bushels per acre, wheat 10 to 15 bushels, and buckwheat 15 to 20 bushels. Apples, Irish potatoes, cabbage, turnips, and sorghum are grown, mainly for home use, and give good yields. Stable manure is the chief fertilizer used, although a few farmers use small quantities of 16 per cent acid phosphate.

The selling price of this land depends upon the topography and the value of the timber. Prices range from \$10 to \$30 an acre.

The Talladega loam soon erodes when cleared, and the greater portion of the type should be left in forest. If cleared, it should be sown to grass for pasturage for cattle and sheep. It is a good fruit soil, and more of it could profitably be used for orchards.

TALLADEGA CLAY LOAM.

The surface soil of the Talladega clay loam is a brownish-red to red loam or clay loam, 6 to 10 inches deep. The subsoil is a red to brownish-red, friable, crumbly clay loam or clay, extending to 36 inches in depth. The subsoil has a decidedly greasy feel, due to the presence of mica scales. The type is derived from mica schist, mica gneiss, and talc schist, which are frequently encountered at depths of 2 or 3 feet. There are a few dark-colored trap rock fragments on the surface in places.

This type is of small extent. It is mapped in the northern part of the county near Springfield and Harmon, and at points along the Ashe County line. There is one fairly large area near Reddies River post office. The type occupies positions at the foot of mountains and on ridge crests. Its surface ranges from smooth to gently

sloping or steep, the smoother areas occurring along the crest of the Blue Ridge. Drainage is good, and excessive on the steep slopes.

About two-thirds of this soil is under cultivation or in pasture, and the remainder is forested with oak and chestnut. A large part of the type lies well for farming.

The most important crops grown are corn, wheat, and buckwheat. Corn yields 15 to 35 bushels per acre, wheat 10 to 20 bushels, and buckwheat 15 to 25 bushels. Crops of minor importance are apples, Irish potatoes, cabbage, turnips, and sorghum. Crops receive very little fertilization, but stable manure is applied when available.

The land sells at \$20 to \$30 an acre, depending upon the state of improvement and the value of the timber growth.

Deeper plowing and the addition of organic matter through green manuring would benefit this soil. The growing of cover crops would help check erosion.

CHANDLER LOAM.

The surface soil of the Chandler loam is a yellowish-gray or dull-yellow to light-brown loam, 6 to 10 inches in depth. The subsoil is a yellow, brownish-yellow, or reddish-yellow, friable, crumbly clay loam or clay. Both soil and subsoil carry an abundance of finely divided mica flakes and have a smooth, greasy feel. The type is derived from soft mica schist, which is usually encountered 18 to 30 inches below the surface. In some places the parent rock is found immediately below the surface soil, and ledges frequently outcrop.

The Chandler loam is confined largely to the northern part of the county. The largest areas are mapped east and west of Basin Creek Church, in the vicinity of Mulberry Gap, and around Friendship Church, Darnell, and Sherman. The type occupies positions on the crest and slopes of the Blue Ridge, and to a smaller extent similar positions on some of the lesser mountains or hills. The surface ranges from smooth to steep and broken, the smooth areas occurring as narrow strips along the crest of the Blue Ridge. The drainage is thorough and on the steep slopes excessive. There were frequent small landslides of this soil during the unprecedented floods of July, 1916.

The Chandler loam is rather extensive, but it is not important agriculturally on account of its steep and broken topography. Not over 5 per cent of the type is cultivated or in pasture. The remainder is in forest, consisting of chestnut oak, red oak, white oak, hickory, chestnut, and some white pine. The crops grown consist of corn, wheat, rye, and buckwheat. Irish potatoes, apples, cabbage, tur-

nips, and sorghum are produced for home use. Some soy beans and oats are grown.

Corn yields 10 to 20 bushels per acre, wheat 5 to 8 bushels, and buckwheat 15 to 20 bushels. Corn and wheat are fertilized by some farmers mainly with 16 per cent acid phosphate, which is applied at the rate of 100 to 200 pounds per acre.

The selling price of land of this type depends largely upon the value of the timber growth. Farm land on the smooth areas along the crest of the Blue Ridge sells for \$25 to \$50 an acre, while some of the rough, steep areas are valued as low as \$4 to \$10 an acre.

Deep plowing and thorough tillage would help increase yields on this soil. The type is deficient in organic matter, and the farmers should either grow green-manuring crops or apply stable manure. Cover crops should be seeded on the steeper slopes to prevent washing. Some of the slopes could well be used for apple orchards. The greater part of the type, however, is not suitable for agriculture and should be left in forest.

ASHE STONY LOAM.

The surface soil of the Ashe stony loam is a brown or yellowish-brown to gray, mellow loam, 6 to 10 inches deep. The subsoil is a yellow or brownish-yellow to reddish-yellow, friable clay, passing into the decomposed parent rock at 24 to 36 inches. Scattered over the surface and embedded in the soil are numerous angular granite and gneiss rocks, which make the type decidedly stony. In many places the underlying rock comes near the surface, and it frequently outcrops in ledges.

The Ashe stony loam is of small extent. The largest area is mapped on the Brushy Mountains around and east of Gilreath School. Other rather large areas are found north of Moxley on Green Street Mountain, and north of Walsh. The type occupies mountain slopes and to a small extent ridges. The topography is steep to broken, with only a few smooth areas on the ridges and gentle slopes. The run-off and internal drainage are good.

This type is not important agriculturally on account of its small extent. Most of it is forested with oak and chestnut. A few small areas are farmed, principally to corn, which yields 15 to 20 bushels per acre. Apples and peaches are produced to a small extent, and some of the fruit is sold on the market. Irish potatoes, cabbage, turnips, and other vegetables are grown in a small way, mainly for home use. Apples and peaches give good results on this soil, and more of it could well be used for orchards. The selling price of this land depends largely upon the timber.

ASHE VERY COARSE SANDY LOAM.

The surface soil of the Ashe very coarse sandy loam is a gray to light-gray very coarse sandy loam, changing at 2 to 6 inches to a pale-yellow color which extends to 8 to 20 inches. The subsoil is a yellow, friable, coarse sandy clay or clay, which either extends to a depth of 3 feet or passes into the decomposed bedrock between the depths of 24 and 36 inches. Large quantities of small, angular quartz gravel occur in the soil, and angular stone fragments are frequently scattered over the surface in small quantities. The type is derived from light-colored granite, and boulders and ledges of this rock are occasionally encountered. The subsoil in places is reddish yellow.

The Ashe very coarse sandy loam is confined to the northeastern part of the county, along Elk Spur, around the base of Stone and Little Stone Mountains, in the vicinity of Garden Creek School, and along the crest of Green Street Mountain. It occurs on the crest and slopes of mountains, and the surface ranges from smooth to steep and broken. The run-off and internal drainage of the type are good. The smoother areas occur along the crests of Green Street Mountain and the Blue Ridge.

This is not an important soil agriculturally, only about 25 per cent of it being under cultivation. The remainder is in forest, consisting of various oaks, chestnut, and some white pine. Corn, wheat, and buckwheat are the principal crops grown, and the yields are comparatively good. Corn produces 10 to 25 bushels per acre, wheat 8 to 10 bushels, and buckwheat 15 to 20 bushels. Irish potatoes, apples, and vegetables are produced in small quantities, and give good yields.

The selling price of this land ranges from \$4 to \$30 an acre, depending on the state of improvement and the value of the timber growth.

The Ashe very coarse sandy loam is a loose, mellow soil, and easily tilled. It is deficient in organic matter, which can be supplied by turning under green-manuring crops or applying stable manure. The steep and broken areas should be left in forest, or if cleared sown to grass as pasture for cattle and sheep.

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

Mechanical analyses of Ashe very coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
235130.....	Soil.....	11.8	14.0	6.4	30.4	15.0	12.5	9.9
235131.....	Subsoil.....	8.0	16.0	8.4	29.4	11.7	18.0	8.2

ASHE LOAM.

The surface soil of the Ashe loam is a yellowish-brown to brown, mellow loam, 6 to 12 inches in depth. The subsoil is a yellow or brownish-yellow to slightly reddish yellow, friable, crumbly clay loam or clay, which usually passes into the decomposed parent rock at 2 to 3 feet. Small quantities of mica flakes are usually present in both soil and subsoil, and occasionally the mica content of the subsoil is sufficient to give a slightly greasy feel. Frequently the underlying bedrock comes near the surface, and angular fragments are sometimes scattered over the surface in small quantities.

The Ashe loam is confined mainly to the northern and western parts of the county. It occurs north of Garden Creek School, along the Alleghany County line, around and south of Lester, near Millers and Vannoy Stores, north of Shoe, and in the vicinity of Darby in the western part of the county. It is developed principally on the slopes of mountains, but some areas are located on the crests. The topography is prevailingly steep or broken, but there are a few gently rolling to rolling areas on the crests of some of the ridges. As a result of the sloping surface and the friable structure of the subsoil the type is well drained.

The greater part of this soil is forested. The timber consists of red oak, white oak, chestnut oak, hickory, poplar, and chestnut. The undergrowth near some of the streams is composed of mountain laurel and rhododendron. There is also a variety of herbs. Less than 5 per cent of the type is cultivated or in pasture. Corn, wheat, and buckwheat are the leading crops. Corn yields 20 to 25 bushels per acre, wheat 8 to 15 bushels, and buckwheat 15 to 20 bushels. Small amounts of 16 per cent acid phosphate are applied to corn and wheat land, and stable manure is used whenever available.

Apples and peaches are produced to a small extent on this soil, and the yields are good. Potatoes, cabbage, turnips, and other vegetables are grown for home consumption. Considerable tan bark, acid extract wood, and lumber are hauled from the forests.

The selling price of areas of the Ashe loam is governed largely by the timber growth. The cleared areas sell for \$20 to \$40 an acre, depending upon the state of improvement.

The Ashe loam, like many of the associated soils, is in large part too steep and broken for farming purposes and best suited to forestry. When cleared, more of it should be sown to grass as pasturage for cattle and sheep. In Ashe and Alleghany Counties the type is used extensively for pasturage purposes. The soil is also well adapted to apples.

ALTAVISTA FINE SANDY LOAM.

The surface soil of the Altavista fine sandy loam is a gray to brownish fine sandy loam, 6 to 10 inches in depth. The subsoil is a yellow or pale-yellow, compact fine sandy clay or clay loam extending to 36 inches in depth, and frequently mottled with gray or brown in the lower part. Small areas of loam and sandy loam are included with the type. During the floods of July, 1916, bars of coarse sand, gravel, and stones were deposited in narrow strips on parts of this soil, and such areas would be mapped as Riverwash if large enough to show on the soil map. The flood waters changed the type considerably in places.

The Altavista fine sandy loam is not an extensive soil in this county. The largest areas are mapped along Elk Creek, Reddies River, and upper Hunting Creek, with smaller areas along other streams. The type occupies stream terraces, and consists largely of alluvial material deposited by flood waters. There has been in places some commingling of colluvial material washed from the adjoining slopes, and this has caused some local textural differences. The surface of the type ranges from level to gently undulating, with a gradual slope toward the stream. It lies mostly above normal overflow, and is well drained.

This is an important agricultural soil, although it is of small extent. Practically all of it is cultivated, principally to corn and wheat. Corn yields 20 to 50 bushels per acre, and wheat 10 to 20 bushels. These crops are fertilized mainly with stable manure, but a few farmers use light applications of 16 per cent acid phosphate. A small amount of hay is produced on this soil.

Areas of Altavista fine sandy loam are usually sold in connection with the adjoining uplands, and the price depends largely upon the value of the latter.

Deeper plowing and the addition of organic matter by turning under green-manuring crops would be beneficial to this soil. A systematic rotation of crops, including legumes, should be followed.

Results of mechanical analyses of samples of the soil and subsoil of the Altavista fine sandy loam follow:

Mechanical analyses of Altavista fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
235134.....	Soil.....	4.4	5.9	3.8	34.2	20.5	18.8	12.4
235135.....	Subsoil.....	3.8	3.0	2.0	21.4	14.6	20.4	34.7

CONGAREE FINE SANDY LOAM.

The surface soil of the Congaree fine sandy loam is a brown to reddish-brown, mellow fine sandy loam, 8 to 10 inches deep. This is underlain by a brown, yellowish-brown or reddish-brown, mellow fine sandy loam, which becomes lighter colored and coarser in the lower part of the 3-foot section. Both soil and subsoil contain some finely divided mica flakes. There are included with the type some slight ridges of light-brown fine sand, too small to show on the map. In poorly drained situations the subsoil at 15 to 24 inches becomes a dull-gray heavy silty clay to fine sandy clay.

The Congaree fine sandy loam occurs along the Yadkin River and many of the smaller streams of the county. It is alluvial in origin, occupying first bottoms along streams. The surface ranges from nearly level to gently undulating, and slopes gradually toward the stream and in the direction of the flow. The surface run-off and internal drainage are good, except in some places where the type adjoins the upland soils. It is subject to overflow during freshets.

Practically all of the Congaree fine sandy loam is cultivated, and it is one of the important corn soils of the county. Wheat is produced to some extent, and hay, melons, and tobacco are crops of minor importance. Corn yields 25 to 60 bushels per acre without fertilization, and wheat 20 to 30 bushels. Hay yields about 1 ton per acre. Tobacco yields 800 pounds per acre, but is grown in only a small way. It is fertilized with 400 pounds per acre of an 8-3-3 mixture. The grade produced is heavy and dark. Watermelons and pumpkins give good yields on this soil. It is well adapted to corn, wheat, oats, and grasses.

The Congaree fine sandy loam is usually sold in connection with the adjoining upland, and its selling value depends upon that of the upland soils.

CONGAREE SILT LOAM.

The surface soil of the Congaree silt loam is a brown to reddish-brown silt loam, 8 to 12 inches deep. The subsoil is a brown, dark-brown, or yellowish-brown compact silt loam or silty clay loam extending to 3 feet or more in depth. There are usually present in both soil and subsoil varying quantities of fine mica flakes. In poorly drained areas adjoining the upland or in sags the subsoil at 24 inches usually passes into a dull-gray heavy clay or silty clay. The lower subsoil is sometimes mottled yellow and brown, and occasionally near the upland the subsoil passes at 20 to 24 inches into a heavy yellow clay loam or clay. Included with the type are areas of Congaree fine sandy loam and narrow ridges of light-brown fine sand which were too small in extent to show on the soil map.

The Congaree silt loam is developed along the Yadkin River and many of the smaller streams of the county. It is a first-bottom alluvial soil, consisting of sediments washed from the surrounding upland and deposited along the streams by water action. The surface is almost flat, with a gradual slope toward the stream channel and in the direction of the flow. The type occupies low-lying positions along streams, and is subject to frequent overflows. The drainage for the most part is good, but there are some poorly drained sags and swales adjoining the uplands.

This is one of the most important soils of the county, although it is of small extent. The greater part of it is under cultivation, only small areas being used for pasturage. It is a good corn soil and is used mainly for this crop, but some wheat and hay are produced. Corn yields 25 to 75 bushels per acre, and wheat 20 to 30 bushels. These crops are not fertilized. Hay yields 1 to 1½ tons per acre.

The selling price of this land depends upon the price of the associated upland soils, in connection with which it is usually sold.

The Congaree silt loam is admirably adapted to corn, oats, wheat, forage crops, and grasses. The poorly drained areas, unless reclaimed by ditching, are best suited to hay production or pasturage.

RIVERWASH.

Riverwash represents an assortment of material deposited in places along the Yadkin River and other streams of the county during the destructive floods of July, 1916. The material ranges in texture from fine sand, medium sand, and coarse sand to gravel, rounded and angular stones, and boulders. The sand is white to yellowish, and occurs on flats and bars which are 3 feet or more deep, and often gravelly or stony. In places along many of the smaller streams the original first-bottom soil has been washed entirely away, and the replaced material consists of coarse sand, gravel, stones, and boulders. In other places the normal stream channels have been widened 50 to 100 feet, and filled up largely with gravel, stones, and boulders. Included with the Riverwash are numerous deposits of dark-brown, highly micaceous raw-earth material locally called "settlings."

None of the Riverwash has been reclaimed for agriculture at present, and it is locally regarded as worthless for crops. Some of the sand is used for building purposes. Part of the areas along the Yadkin River could possibly be reclaimed by the liberal use of stable manure and the turning under of green-manuring crops. Applications of complete fertilizer would also be necessary. These suggestions apply only to those areas where the soil is uniformly sandy.

MEADOW (CONGAREE MATERIAL).

Meadow (Congaree material) comprises narrow, low-lying areas of bottom land along the smaller creeks and branches of the county. The soil varies in color from brown to reddish brown or red, and in texture from gravel or coarse sand to silt or loam. The subsoil is yellowish to brown or reddish brown, and in the poorly drained areas mottled brown and gray. Mica flakes usually occur throughout the soil and subsoil.

The surface is almost level, with a gentle grade toward the stream and in the direction of its flow. Most of the type is subject to overflow during periods of heavy rainfall, and new material washed from the adjoining slopes is constantly being added to the soil. The greater part of the type has poor drainage, although there are many relatively high areas which are well drained. Ditching is necessary in many places to produce crops.

This is an unimportant soil agriculturally, on account of its small extent. About 50 per cent of it is cultivated or in pasture. The remainder supports a growth of willow, birch, and other water-loving trees. Corn and hay are the principal crops produced, and the yields are fair. The type when properly drained is well suited to corn, oats, and grasses.

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

ROUGH STONY LAND.

Rough stony land includes rough, steep mountain slopes and peaks where the surface is practically covered with loose rock and boulders and where there are frequent outcrops of the bedrock. The interstitial soil material is a brown loam, and the subsoil when present is a yellow to reddish loam or clay loam. In the Piedmont section of the county the type consists of rough, steep areas strewn with stones and boulders and containing numerous outcrops of the bedrock.

Rough stony land is confined largely to the northern part of the county. Large areas are mapped north of Basin Creek Church, at the foot of Combs Knob and Elk Spur and on the slopes of Green Street Mountain. Smaller areas are found at various points on the Brushy Mountains and elsewhere in the county.

The type is unsuitable for farming. It is practically all in forest, and its value depends upon the timber growth.

ROCK OUTCROP.

Rock outcrop comprises bare exposures of rock, chiefly granite, ranging in size from a few acres to one-half square mile. In a few places there is a shallow covering of earth which supports a small

growth of cedar, holly, and scrub pine. The type is nonarable and unfit for crop production.

The largest exposure of Rock outcrop is represented by Stone Mountain, in the northeastern part of the county. This is a barren mass of granite rock with slopes that have an almost perpendicular drop of several hundred feet. The rock is granite, and it is said to be valuable as building stone, although none of it is quarried.

SUMMARY.

Wilkes County is situated in the northwestern part of North Carolina, in the Appalachian and the Piedmont provinces. It has an area of 735 square miles, or 470,400 acres. The topography ranges from undulating or gently rolling to hilly, steep, and broken. Mountains characterize the southern, western, and northern parts of the county. Elevations above sea level range from 1,000 to 4,000 feet. The general slope of the county is eastward. It is drained by the Yadkin River and numerous tributaries, and all parts of the county have good drainage. Water power can be developed along many of the streams.

This county was formed in 1777. The early settlers were mostly English. The population of the county in 1910 was 30,282, or an average of 41.2 persons to the square mile. Northwilkesboro is the largest town, with a population in 1910 of 1,902. Wilkesboro, the county seat, has a population of 799. Railroad facilities in the south-central part of the county are good, but the northern and southern parts have no railroads. There are several miles of graded wagon roads which are in good condition during dry seasons. Telephone and mail facilities are fairly good throughout the county. Northwilkesboro is the chief market and distributing point for the agricultural products of the county.

The mean annual temperature as recorded at Brewers is 56.7° F., and the average annual rainfall is 55.65 inches, which is well distributed throughout the year and sufficient for all the common crops.

Agriculture in Wilkes County at the present time consists principally of the production of corn and wheat. Fruit growing is an important industry. Large quantities of vegetables, tree fruits, and blackberries are canned and sold on the markets. Lumber, cross-ties, tan bark, and acid extract wood are important forest products. Dairy products and poultry are sold to a large extent.

According to the census, the total expenditure for fertilizer in 1909 was \$39,919, and for farm labor \$70,677. The average size of the farms in that year was 78.6 acres. Of the 5,233 farms in the county, 74.6 per cent were operated by owners and 25.1 per cent by tenants. The prices for average farm land range from \$25 to \$50 an acre.

The soils of the county are largely derived from mica schist, granite, gneiss, and mica gneiss, together with some garnetiferous schist, talc schist, and dark trap rock. The rocks are mostly fine grained, and the soils are prevailing loams or fine sandy loams. In all, 22 soil types and 3 phases, in addition to Riverwash, Meadow (Congaree material), Rough stony land, and Rock outcrop, are mapped. The upland soils are grouped in the Cecil, Davidson, Appling, Durham, Porters, Talladega, Chandler, and Ashe series, and the alluvial soils of the terraces and flood plains in the Altavista and Congaree series.

The Cecil fine sandy loam, loam, and clay loam are the most important upland soils of the county. They are used largely for the production of corn and wheat. The Cecil loam, steep phase, and the Cecil clay loam, steep phase, are best suited to forestry or pasturage.

The Davidson clay loam is well adapted to wheat, clover, and alfalfa, while the Cecil fine sandy loam and Durham coarse sandy loam are good tobacco soils.

The Porters stony loam and loam are extensive mountain soils, largely in forest. Small areas are used for improved orchards, and these soils are well adapted to fruit growing.

The Talladega loam, Chandler loam, and Ashe loam are extensive soils, principally in forest. On account of their steep and broken topography they should be largely left in timber.

The Altavista fine sandy loam and Congaree fine sandy loam and silt loam are important corn soils, and the greater part of their area is devoted to this crop. They are also good wheat and hay soils. The Congaree soils are subject to overflow during freshets.

Meadow (Congaree material) is an alluvial soil of varied color and texture. It is subject to overflow, and part of the type is poorly drained. Some of it, however, is used for the production of corn and hay.

Riverwash, Rough stony land, and Rock outcrop are miscellaneous soils of practically no agricultural value.



[PUBLIC RESOLUTION—No. 9.]

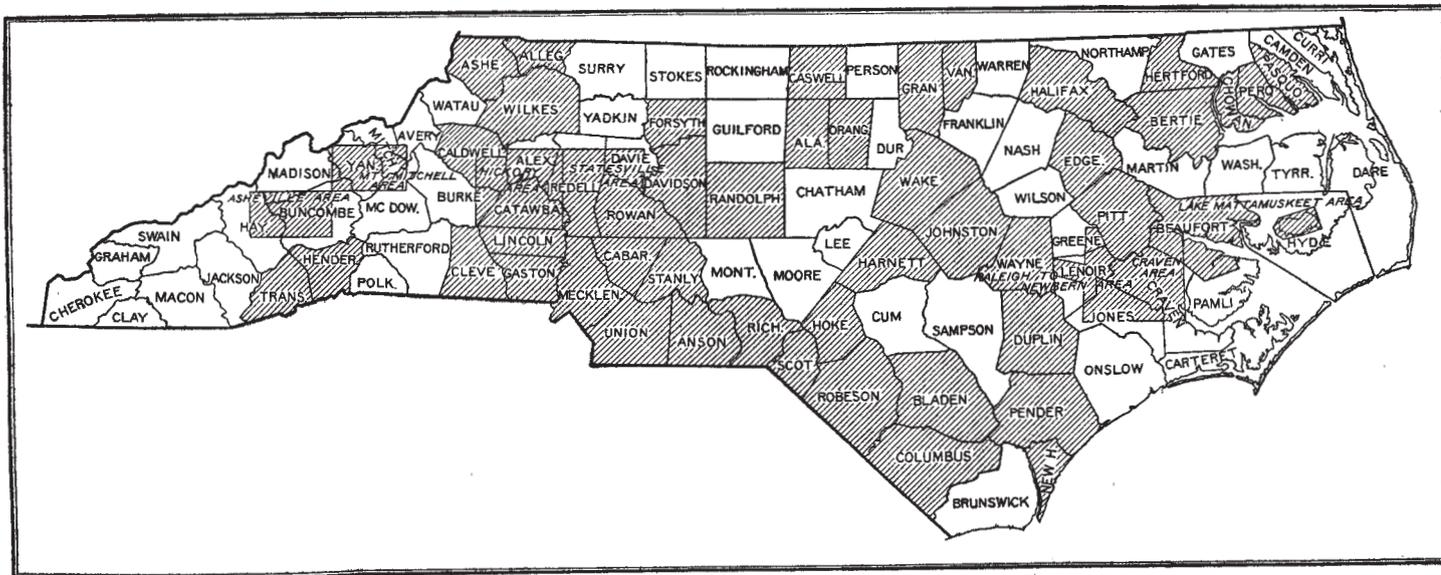
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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

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

Approved, March 14, 1904.

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



Areas surveyed in North Carolina.

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