

SOIL SURVEY OF THE STATESVILLE AREA, NORTH CAROLINA.

By CLARENCE W. DORSEY and PARTY.

INTRODUCTION.

The Statesville sheet is the farthest east of the United States topographic sheets in western North Carolina, and photographic enlargements of this map were used to project the present survey upon. A number of years have elapsed since this map was surveyed, and there have been many changes in the minor as well as principal roads, but it was found impracticable to make these changes on the base map.

The survey was carried on in close cooperation with the North Carolina State board of agriculture, which bore all the expenses incident to the survey, exclusive of salaries. (Fig. 8.)

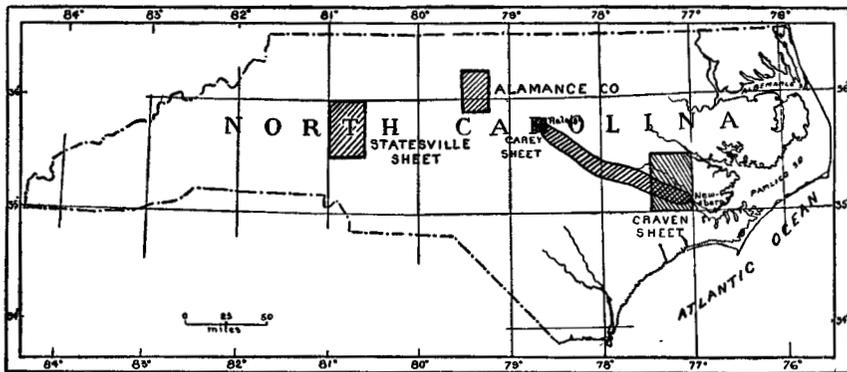


FIG. 8. Sketch map showing areas surveyed in North Carolina.

In connection with the survey of the Statesville area advantage was taken of the opportunity to train a number of young men in the methods of soil-survey work. The men selected for this purpose were Frank Bennett, jr., W. E. Hearn, F. O. Martin, C. N. Mooney, T. D. Rice, J. B. Stewart, and H. J. Wilder. Messrs. W. G. Smith and G. N. Coffey were also members of the party, and as both of these men had had considerable experience in soil mapping, they were of great assistance. In a short time after the work was begun each of these men was placed in charge of a party, and during the latter part of May Mr. Coffey was left in complete charge of the survey, with Mr. Hearn as an assistant.

LOCATION AND BOUNDARIES OF THE AREA.

The area surveyed is situated in the western part of the broad Piedmont Plateau region of North Carolina. It lies between the parallels $35^{\circ} 30'$ and 36° north latitude and the meridians $80^{\circ} 35' 45''$ and 81° west longitude. The area extends in an east and west direction 23 miles and in a north and south direction 35 miles, and comprises 501,750 acres, or about 784 square miles. The area surveyed does not include all of the Statesville topographic sheet, but omits the eastern fifth of the sheet. The greater part of Iredell County lies within the limits of the area, as well as the western portions of Rowan and Davie counties, small eastern portions of Catawba and Lincoln counties, and a small strip along the northern edge of Mecklenburg county.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

It is a difficult matter to obtain definite information in regard to the early history of this section of North Carolina. A few histories touch on the early settlement and conditions at the time when the first white men came here, but these references are very general and it is difficult to tell how much applies to the counties in the area surveyed.

The Catawba Indians were the most numerous of the tribes living in this section. They were generally considered a peaceful nation, and they practiced some primitive agriculture. They raised corn, beans, and melons, cultivating their crops by scratching the soil with wooden hoes. They also lived on wild fruits, of which there were many different kinds. Wild plums, peaches, and cherries were found in abundance, and many varieties of grapes and berries. A variety of red peach still grown in this section is commonly known as the "Indian peach," while the Chickasaw grape was so called after the tribe of Indians of that name.

The first white settlement was probably made about the year 1735, and it is positively known that there were white settlements of considerable importance as early as 1750. Among the early settlers were many Germans and Moravians. The Scotch-Irish immigrants from the northern part of Ireland also came in large numbers by way of Pennsylvania and Virginia. It is stated on the authority of some of the older men living in the area at the present time that the open prairie condition of a small portion of the country greatly encouraged immigration and the rapid settlement of the country. These prairies are said to have been covered with pea vines and canebrakes, with only occasional scattered trees. The prairies afforded fine pasturage for stock both in summer and winter, and were, moreover, easily cleared and prepared for cultivation. The prairie condition along the rivers and streams was attributed to the Indians, who each year burned the grass and thick mat of dried vines, thus preventing the trees from getting a

foothold. The heavy forest growth of oak, poplar, and hickory found on the uplands at the time the country was first explored is said to have gradually extended to the bottoms during the last one hundred and fifty years. The forest pine, commonly found in the large tracts of woodland, as well as the cedars, made their appearance many years after the advent of the whites.

The early settlers cultivated corn, which was the principal bread crop, as well as oats, barley, and a small quantity of tobacco. The tobacco was packed in large barrels or hogsheads and hauled to market in Lynchburg or Richmond. The barley was used principally by the distillers to make malt, and any surplus corn was at once turned into whisky in order that it could be more easily hauled to market. Cotton was not extensively grown at an early date, for ginning by hand was a slow, laborious process. Flax was grown for clothing for summer wear. As soon as wolves were exterminated sheep were introduced. Cattle were raised in large numbers and frequently driven to Philadelphia and Charleston markets. The early farmers had to depend almost altogether on themselves for subsistence. Their supplies were hauled by wagon from points as far distant as Fayetteville, or other large cities in adjoining States. Little coffee and sugar were used, although large supplies of wild honey were found and consumed. Salt was difficult to obtain, and most of the supply of this commodity was hauled from Virginia. As soon as the cotton gin was invented and introduced cotton was grown as a leading crop, although it was not until about twenty-five years ago that this staple assumed its present prominence.

CLIMATE.

The climatic conditions^a of the Piedmont portion of the State are quite different from those of the mountainous section or of the eastern Coastal Plain region. In the Statesville area the extremes of temperature are greater than in the eastern part of the State, and the rainfall is noticeably less. On the other hand, this section frequently receives a greater snowfall than the mountain section.

Temperature and rainfall records have been kept for a number of years at Statesville, the county seat of Iredell County, and the figures for that station are used for the entire area surveyed. In the mountainous regions in the northwestern part of the sheet there are, doubtless, some slight differences, but with this exception the figures well represent the climatic conditions of the entire area. Temperatures of 102° have been recorded during the month of August and the mercury has occasionally registered as low as 5° above zero, so that the extreme range of temperature does not exceed 100°.

^aBulletin No. 8, N. C. Geological Survey. J. A. Holmes, geologist.

The following table gives in detail the data afforded by the Statesville records:

Normal monthly and annual temperature and precipitation for Statesville, N. C.

Month.	Temperature.	Precipitation.	Month.	Temperature.	Precipitation.
	° F.	Inches.		° F.	Inches.
January	36.0	4.75	August.....	75.8	5.66
February	40.0	4.50	September.....	68.4	2.66
March	46.0	5.36	October.....	55.8	3.66
April	57.1	3.19	November.....	44.9	2.84
May	65.4	5.24	December.....	35.9	3.69
June.....	72.7	4.64	Year	56.3	51.57
July.....	77.1	5.38			

PHYSIOGRAPHY AND GEOLOGY.

An intelligent understanding of the history of the land surface and of the underlying rocky floor or platform frequently throws much light on the drainage conditions of a country, as well as on the fertility and productiveness of the soils. Whether the country be rough or broken, with sufficient elevation to secure good drainage, is always a pertinent question, as well as whether the soils are derived from materials that will insure their lasting fertility.

In the area under consideration it has been ascertained that the surface is that of a worn-down system of mountains. The constant beating of the rains and the eroding action of the rivers and streams, together with the weathering action of the atmosphere, have succeeded in reducing this once mountainous region to a comparatively level plain. Since this region was base-leveled, as the wearing-down process is called, it has been reelevated, and stream action and the rains have begun their erosion again. As a result we have the rather deep valleys along the water courses, while farther away from the streams are the broad, flat-topped uplands, the remains of the old plateau surface. These broad stretches of upland have an average elevation of about 1,000 feet above sea level, and in some parts of the area one can drive for miles without any considerable change in elevation. The railroads have followed these broad, level divides, as have also some of the principal wagon roads of Iredell County.

Looking from the water standpipe in Statesville the remarkably even sky line is at once the most noticeable feature of the landscape. This even sky line represents the level of the old plateau, and the valleys along the streams show the amount of erosion that has taken place since the region was reelevated.

This plateau is commonly referred to as the Piedmont Plateau, which extends as a broad rolling upland, east of the Appalachian Mountains, from Maine to Alabama. In the Carolinas it attains its

maximum development. Here the surface features are typical of the western part of the Piedmont Plateau. The average elevation is 1,000 feet, while the rivers have carved out valleys about 250 feet below the level upland. Along these valleys numerous small streams have cut their way back to the upland and considerably modified the surface. The larger valleys have steep hills on each side, and in many of them the streams are building extensive flood plains, forming bottom lands generally considered the most valuable lands of the entire region. Although there are many large areas of level upland, they are all thoroughly drained, the drainage system of the entire area being excellent. The drainage is generally to the eastward and southeastward. Along the larger streams there is an abundance of fine water power, and a considerable number of grist and saw mills are seen along the creeks, while on the Catawba and Yadkin rivers are a few cotton mills depending altogether on these rivers for their motive power.

In the northwestern part of the area are the outlying foothills of the Brushy Mountains. These also belong to the Piedmont Plateau, and represent masses of rock which have more successfully resisted the wearing-down agencies of air and water; hence they rise several hundred feet above the general plateau level. McCarg's Mountain is the highest of these seven small, steep-sided peaks. It has an elevation of 1,550 feet above sea level, and its steep slopes, as well as the slopes of the smaller mountains, are thickly strewn with large masses of huge bowlders, rendering them unfit for general agricultural purposes.

In the survey of the soils of the Statesville area some attention was given to the various rock formations which are represented. This was necessary on account of the direct relation between the soils and the underlying rocks. The soils are the direct results of the decomposition and disintegration of the rocks upon which they rest.

The rocks in the Statesville area are typical of the Piedmont Plateau. Of the two varieties of granite found in the area, one occurs in the vicinity of Mooresville. This is coarse grained, contains large feldspar crystals, and decomposes into a characteristic red clay subsoil, while the surface is a deposit, often many inches thick, of gray sandy soil. The other granite is found about Elmwood, where it is associated with a dark-green rock called diorite, which weathers into the yellow impervious clays of the Iredell clay formation. Where the bands of white granite are wider the soil becomes much more sandy, due to the large amount of quartz this granite contains. The diorite occurs extensively as an intrusive rock. It consists largely of hornblende and other minerals. It commonly weathers into red clay soils, but about Elmwood distinctive beeswaxlike clays represent the decomposition product of this rock. Under the yellow clay is found, at an average depth of 24 inches, a soft, partially decomposed green

diorite rock. Crystalline micaceous schists and black hornblende gneiss are found in abundance. These rocks contain quartz, mica, and hornblende, and weather into red clays, which are generally covered with a shallow layer of sandy material—the broken fragments of quartz of the original rock. There are besides these rocks small areas of soapstone and talcose schists. These rocks contain large amounts of magnesium silicates and have been considerably altered by the processes of metamorphism.

SOILS.

Of the seven types of soil recognized in the Statesville area six are residual, having been derived from the long-continued process of rock decomposition. These soil types vary in texture, in their relation to heat and moisture, often in color, in crop producing value, and in drainage conditions, as well as in their money value. The differences are marked and striking and can be readily told in the field. The type of soil not derived directly from rock decay is the bottom land found along streams and described in this report as Meadow. Differing in origin and in its physiographic relations from the other soils, it also differs in money value. In many cases the bottom lands have been held at a price not warranted by the crop-producing value of this character of land as compared with the higher, better drained upland or hill soils.

The areas of the several soil types are shown in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay	289,590	57.6	Herndon stony loam	8,130	1.6
Cecil sandy loam.....	148,910	29.6	Davie clay loam	3,370	.6
Iredell clay loam.....	22,340	4.4	Meadow	18,850	3.7
Durham sandy loam	10,560	2.5	Total.....	501,750	.....

CECIL CLAY.

The Cecil clay is so similar to the red clays of Cecil County, Md., and the red clays of the region just east of Raleigh, N. C., where soil surveys have been made, that it has been correlated with the soils of these areas. It is the characteristic red land of the Southern Atlantic States in the Piedmont Plateau. In the Statesville area it occupies about 410 square miles—a little more than one-half of the area surveyed. It is found on the upland, the gentle slopes, and, especially, on the hills and more rolling lands along the larger rivers. Wherever the effects of washing and gullying are noticed, there the distinctive red clays are always recognized. There is little regularity in its occurrence on the level upland or steep slopes. Generally, however,

over the greater part of the area it occupies the slopes of hills and other places where there is a tendency toward washing from heavy rains. The largest unbroken bodies of this soil, as will be seen from an inspection of the map, are the areas north of Statesville, immediately south of Mooresville, and a few miles south of Cleveland.

The Cecil clay is a residual soil, formed, in situ, by the long continued processes of decomposition, from a number of rock types distinct in their physical and mineralogical characters. The soil has been derived from nearly all of the rocks occurring in this section, mainly hornblende gneiss, micaceous schists, coarse-grained granites, and, to a less extent, soapstone or steatite. Many of these rocks differ quite widely, yet so deeply have they been weathered that they give rise to the same distinctive red clays. The gradation from the soils to the rocks is nearly always gradual, and frequently it is difficult to mark the dividing line between the two. Often the rocks have decayed so deeply that it is difficult to determine their original composition. Again, the structure of the rock may be preserved, but on digging into what appears to be comparatively sound rock, the material crumbles between the fingers, showing how thoroughly decomposition has taken place.

The soil consists of a heavy red loam from 2 to 7 inches in depth, with an average depth of 5 inches. In many places the soil contains from 5 to 50 per cent of quartz fragments and pieces of various rocks from which it is derived, but as a general rule these soils are not very stony. The rock fragments found on the surface vary from 2 to 10 inches in diameter. At some places on the steep slopes, especially along the Catawba River, large numbers of huge boulders are scattered over the surface.

The stony areas of the Cecil clay are not regular in distribution, but are scattered about indiscriminately wherever the formation is found. Many fields have a small, stony patch, while often hundreds of acres may be seen that are entirely free from stones. The subsoil is a stiff, tenacious red clay to a depth of 3 feet or more. Generally the percentage of clay increases at lower depths. Often it is slightly micaceous and sticky, and occasionally has a slight greasy feel when rubbed between the fingers. In some localities the subsoil contains some quartz fragments and pieces of other rock. The subsoil, although a tenacious clay, possesses good natural drainage, even when it has a depth of 10 feet or more.

In addition to the typical section of Cecil clay that has just been described, there are some small areas of what is locally known as "dead land." Such areas are always found in the Cecil clay formation and occupy slight depressions, or are found on the gentle slopes. They owe their origin to the position which they occupy, and are formed by a slight rewashing of Cecil clay soil. The soil is a dull

reddish-brown loam from 8 to 36 inches in depth, usually becoming heavier in the lower depths. It is called dead land, not because it is infertile, for on the contrary it is quite productive, but because it sticks to the plow and makes cultivation somewhat difficult. The extent of such land found in the Statesville area probably does not much exceed 1,000 acres. In addition to the small areas of dead land, in many places a type of sandy soil was correlated with Cecil clay. In these cases the tenacious clay subsoil is so near the surface that it gives character to the soil. In these areas the soil consists of gray, sandy loam to a depth of from 2 to 4 inches. These, although having a distinctly sandy soil, were classed with the Cecil clay.

The following table gives the mechanical analyses of a number of typical samples of both the soil and subsoil of the Cecil clay:

Mechanical analyses of Cecil clay.

[Fine earth.]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.		Organic matter and combined water.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.								
5320	1 mile SW. of Mt. Mourne.	Typical red loam, 0 to 7 inches.	0.01	5.06	1.56	9.43	11.74	21.02	9.72	20.75	19.11	
5324	½ mile S. of Bethesda church.	Heavy red loam, 0 to 7 inches.	.01	7.32	3.50	11.19	10.65	20.39	9.04	15.55	22.17	
5315	1½ miles N. of Mooresville.	Heavy red loam, 0 to 7 inches.	.01	5.26	5.70	7.95	8.66	23.21	13.14	12.14	22.64	
5313	1¼ miles N. of Morrisons Mill.	Heavy red loam, 0 to 8 inches.	.01	5.06	7.32	10.86	7.75	19.01	8.15	14.47	26.63	
5316	Subsoil of 5315..	Granite soil, 7 to 36 inches.	.....	7.88	2.61	4.00	5.24	16.73	7.07	13.78	42.54
5321	Subsoil of 5320..	Stiff red clay, 7 to 36 inches.	.01	9.61	0.64	4.16	4.94	9.34	5.05	17.58	49.35	
5319	Subsoil.....	Virgin land 150 yards from where 5316 was collected.	.01	8.89	6.71	4.89	3.91	8.81	5.77	11.15	49.40	
5325	Subsoil of 5324..	Stiff red clay, 7 to 36 inches.	.01	8.62	0.94	3.68	3.81	8.53	5.44	14.49	53.41	
5314	Subsoil of 5313..	Heavy red clay, 8 to 36 inches.	.01	8.93	2.50	4.73	3.12	7.91	4.36	5.26	62.84	

The Cecil clay is recognized as the strongest land in this section of the State for general farming purposes. In some of the more hilly

regions it is not very productive, for it is apt to be stony and rough; but as a general rule this soil is quite susceptible to improvement and can be made exceedingly productive. Deep plowing greatly benefits this soil, and well-informed farmers say that it will retain fertilizers for a good many years. It needs thorough cultivation before, as well as after, the crop is planted, and in almost every case the addition of well-rotted stable manure and clover or other green manures produces a wonderful effect in increasing its fertility. While it is a heavy clay soil and requires better implements and more thorough cultivation than some other soils, the increased expenditure in preparing this land is more than balanced by the larger crops that can be produced upon it.

Corn makes a good growth on the Cecil clay, and 50 bushels per acre can be grown by good farming, but the average yield rarely exceeds 15 or 20 bushels per acre. Considerable cotton is grown and good yields are reported, but many farmers maintain that cotton matures late on clay land; that it can not be properly worked on such soil early in the spring, and, besides, that the red clay stains the lint. Therefore this soil is not generally desired by farmers for growing cotton, but good crops can be made and many farmers say it is as good cotton land as the gray sandy land. From one-third to 1 bale per acre can be raised, but one-half bale represents the average yield. Wheat succeeds well, especially on land that has been deeply plowed and thoroughly pulverized before the seed is drilled. Yields of from 5 to 30 and even 40 bushels per acre are reported, but the average yield does not exceed 12 bushels. The average yield of oats is about 20 bushels per acre, although the crop is seldom thrashed, but fed in the straw. Cecil clay is good clover and grass land, but trouble is often experienced in getting a stand in unfavorable seasons.

The forest growth is principally hard wood; white, red, post, chestnut, and black-jack oaks are found. Hickory, dogwood, black and sweet gum, persimmon, sourwood, black walnut, ash, and poplar are also important deciduous trees. Large quantities of poplar are annually cut and used in the manufacture of a medium grade of furniture. Considerable pine is also found in the original timber, while all of the abandoned fields are thickly covered with a growth of old-field pine.

CECIL SANDY LOAM.

This soil type has likewise been correlated with a similar soil mapped in the vicinity of Raleigh. It is frequently spoken of as gray land, or sandy land, although this soil is not the typical gray sandy land of many large areas in the southern Atlantic States, but represents, rather, an intermediate type between the heavy red clay and the deep gray sandy lands. It possesses the subsoil of the former type, but the shallow, sandy soil characteristic of the latter.

The Cecil sandy loam, while not occupying such extensive areas as the Cecil clay, is found in almost every portion of the Statesville area. Few large, unbroken bodies are found, although there are extensive areas in the extreme southeastern part in Rowan County and in the central portion of Iredell County to the east and southeast of Statesville. The formation occupies about 232 square miles, or 29.6 per cent of the area surveyed.

Generally the formation is found on the slightly undulating uplands and more gentle slopes, where the effects of washing are not pronounced. Even on the tracts of upland natural drainage is excellent, and it is seldom the case that artificial drainage need be resorted to for general farming purposes. The greater part of this soil type occurs from 900 to 1,000 feet above sea level. This soil, also, is residual, and has been derived from a number of the complex and crystalline rocks that are characteristic of the Piedmont Plateau. Decomposition has gone on to a considerable depth, and road-cut sections were frequently seen where the total depth of soil and subsoil exceeded 15 feet. The rocks forming this soil have been thoroughly decomposed, and only the hardest pieces of the original rock, or fragments of quartz, are seen scattered on the surface or through the soil itself. It is principally derived from coarse and fine grained granites, from hornblende gneiss, and from fine micaceous schists. It varies in color from a light gray to a yellowish brown, and consists of a coarse to fine sandy loam from 4 to 15 inches in depth, with an average depth of 7 inches. The sand is sharp, angular, quartz sand. The percentage of quartz fragments and stones on the surface is about 20 per cent on the average. These stones range from 2 to 12 inches in diameter. Frequently, also, in small local areas, the surface is thickly strewn with small iron concretions seldom exceeding one-half inch in diameter.

The subsoil is identical with that which has been described for the Cecil clay formation. It is a tenacious red clay always at least 3 feet deep, and in many cases of a depth exceeding 10 or 15 feet. The subsoil also contains some quartz fragments, and is generally slightly micaceous.

The table following gives an opportunity to compare the texture of typical samples of this formation with the Cecil clay. It will be noticed that the subsoils are similar, while the soils are entirely different.

Mechanical analyses of Cecil sandy loam.

[Fine earth.]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.	Organic matter and combined water.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
5327	¼ mile N. of Amity Hill.	Yellowish-brown sandy loam, 0 to 9 inches.	0.01	2.48	14.15	15.03	9.50	20.46	12.61	17.17	7.64
5311	1 mile N. of Bryantsville.	Sandy loam, 0 to 7 inches.	.....	3.90	6.96	11.54	8.80	22.40	16.80	19.30	10.46
5328	Subsoil of 5327.	Stiff red clay, 9 to 36 inches.	.....	9.22	4.12	3.88	2.30	4.90	2.64	18.70	52.81
5312	Subsoil of 5311.	Red clay, 7 to 36 inches.	.01	9.73	5.59	4.10	2.66	6.93	6.10	11.17	53.69

On account of the layer of sand overlying the stiff clay subsoil, these soils can be cultivated much earlier in the spring, and are, moreover, much more easy to cultivate than the heavy clay loams of the Cecil clay. On this account they are frequently more in demand by the poorer class of farmers, who do not thoroughly understand the cultivation of clay lands, or who have not the means or stock necessary to cultivate a heavy soil. The Cecil sandy loam has always been considered a good land for cotton on account of the excellent surface drainage and the ease with which it can be cultivated. Cotton yields from one-third to a bale of lint per acre, while one-half bale represents the average crop. It is also a good corn soil, although the average yield does not exceed 12 to 15 bushels, and a yield of 25 bushels is considered large. It does not make an ideal wheat soil. From 3 to 15 bushels are the reported yields, although it is seldom the case that the crop harvested equals the latter figure. As high as 50 bushels of oats can be grown on an acre, but 15 or 20 bushels are a good average crop. It is good fruit and truck land, and formerly considerable bright tobacco was grown on this soil. In almost every section where this soil formation occurs, tobacco barns are noticed, some of which have not, apparently, been erected more than five years. For a number of years tobacco was one of the leading crops of this section, and it is said that the growers made a fair profit, but competition with other sections of the State, better adapted to produce a fine quality of the bright-yellow tobacco, has put a stop to the industry here.

The timber growth is much like that of the Cecil clay, except that

the pines are much more abundant. This soil is generally considered fair farming land, and frequently commands as good a price as the Cecil clay. It is not considered, however, as safe and strong for agricultural purposes, on account of liability to drought in dry seasons. This soil usually corresponds to the typical section that has been described, although about Enochsville the sand is deeper and coarser and the subsoil in many places consists of a yellowish-red clay that is as tenacious as the typical red clay subsoil.

IREDELL CLAY LOAM.

This soil formation takes its name from the county in which it was first found. Locally it is called "black-jack land," on account of the abundance of the oak of that variety, or "beeswax land," because of the great similarity of the impervious yellow clay subsoil to beeswax. The largest areas of this soil are along the South Yadkin River, in the southern part of Davie County and northern part of Rowan County. There are also extensive areas north of the towns of Elmwood and Cleveland, in Rowan County. The formation is found on the level uplands and there are also many large areas along the steep slopes of Yadkin River. It is a residual soil and has been derived from the weathering of diorite, an igneous rock with a granitelike structure, consisting principally of soda-lime feldspar and hornblende. The soil is also derived from the weathering of aplite, a highly metamorphosed acid granite. In addition to these rocks there are some small areas of chlorite schist that are deeply weathered, giving rise to this character of soil. The soil varies in color from a dark-gray to a black loam and in depth from 3 to 12 inches, with an average depth of 8 inches. In the area along the Yadkin River the soil is more sandy and somewhat deeper. On the surface there are some scattered fragments of the rocks from which it is derived, and in a few localities are large rounded boulders of diorite, locally known as "niggerheads." The soil also has scattered about on the surface a large quantity (from 5 to 40 per cent) of iron concretions ranging in size from one-fourth to three-fourths of an inch in diameter. These iron concretions are particularly evident in the areas north of Elmwood and Cleveland. Wherever the soil is slightly sandy, as is the case where it has been derived from aplite, the amount of iron concretions is considerably less. The presence of these concretions on the surface has frequently caused this soil to be called "gravel land." The subsoil is usually separated from the soil by a distinct change in color, and it is, moreover, of an altogether different texture. It consists of a very tenacious, stiff, impervious yellow clay, closely resembling great, thick sheets of beeswax. At a depth of from 18 to 26 inches the subsoil grades into soft, sticky, decomposed rock, and gradually, in the lower depths, into soft masses of partially decayed diorite.

The following table shows the texture of the dark, loamy soils and the sticky, impervious subsoils:

Mechanical analyses of Iredell clay.

[Fine earth.]

No.	Locality.	Description.	Soluble salts as deter-	Organic matter and com-	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.06 mm.	Silt, 0.06 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			mined in mechanical analysis.	bined water.							
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
5335	1 mile N. of Elmwood.	Dark gray loam, 0 to 10 inches.	0.01	4.75	25.54	5.28	3.20	11.98	17.58	24.37	7.92
5333	¼ mile N. of Elmwood.	Dark gray loam, 0 to 7 inches.	.01	4.15	14.04	7.67	3.21	11.44	18.05	34.10	8.03
5336	Subsoil of 5335..	Stiff pipe clay, 10 to 24 inches.	.01	8.76	.80	1.50	1.52	9.36	7.10	33.88	37.33
5334	Subsoil of 5333..	Sticky, beeswax clay, 7 to 24 inches.	.01	9.13	1.95	2.36	1.52	6.11	5.96	34.94	37.34

Wherever the yellow clays are exposed to weathering the distinct yellow color changes to a dirty, brownish yellow. The crops that are grown on this soil are those common to the Statesville area. It is considered the poorest soil of the area, and produces only about one-half as much as the Cecil clay. On account of the very impervious character of the subsoil crops suffer equally from excessive rainfall or from prolonged drought. It is cold and late in the spring on account of the poor drainage, especially in the more level areas, but along the steep slopes north and south of the Yadkin River this soil possesses good underdrainage, and little difficulty is there experienced on account of the impervious character of the subsoil. When this soil is first cultivated it produces well for one or two years, but afterwards it tends to run together, or to become puddled, after which it is difficult to improve. It is best adapted to wheat and cotton, although cotton is subject to rust. Land of this character generally commands a low price; much lower in fact than any other of the soil formations of the entire area. The timber growth, especially on the level uplands, consists largely of black-jack, post, and willow oak, in addition to which many of the other deciduous trees common to the neighborhood are found.

DURHAM SANDY LOAM.

This type of soil is similar to large areas that occur in the neighborhood of Raleigh. It is a typical, deep, gray sandy land of North and

South Carolina. There are no extensive areas found in the Statesville area, and altogether the formation does not occupy more than 16 square miles. The largest areas occur in Davie County and along the boundary line between Iredell and Rowan counties. The formation occurs in small isolated areas on the level upland or slight slopes, from 900 to 1,000 feet above sea level. This is a residual soil derived from granite, gneiss, and schist. Wherever the largest areas of this soil were found it was noticed that the soil represents the decomposed products of a fine-grained, grayish granite. Like many of the other soils of this region, the rocks have been deeply and thoroughly decomposed, and road cuts were seen where the total depth of soil and subsoil exceeded 20 feet. The soil consists of a grayish sandy loam from 8 to 15 inches in depth. The sand is sharp quartz sand, generally free from fragments of rock. In some cases stones were observed on the surface, but they rarely exceeded 20 per cent, ranging in diameter from 2 to 12 inches. In the locality near Mount Vernon Church, in Rowan County, bowlders several feet in diameter are scattered about. The subsoil is a yellow clay loam, which also contains some sharp quartz sand. At a depth of about 15 to 18 inches the clay content increases perceptibly and the yellow color deepens to brownish red, and at a depth of about 30 inches the typical red clay subsoils appear. This is fair soil for general farming purposes, but it is considered too light and porous for wheat. It is considered poorer land than either the Cecil sandy loam or the Cecil clay formation. When well fertilized it is adapted to cotton and tobacco. At the time when tobacco was generally grown in this section the small spots of this formation were hunted out, because it had been discovered that a fine quality of bright tobacco could always be produced upon such areas. It was on soils of this character that the bright-tobacco industry was begun in the central portion of the State, and tobacco is still one of the leading crops in that section. In the Statesville area the areas of Durham sandy loam are usually too small to admit of much success in growing bright tobacco. Cotton, when properly fertilized and taken care of, will produce as much as one bale per acre, but the average crop is from one-third to one-half that quantity. The forest growth is similar to that mentioned for the Cecil clay, except that the pine is much more abundant.

The following table contains the mechanical analyses of typical samples of the deep, sandy loam soils and the yellow clay loam subsoils:

Mechanical analyses of Durham sandy loam.

[Fine earth.]

No.	Locality.	Description.	Soluble salts, as deter-	Organic matter and com-	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.05 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			mined in mechanical analysis.	bined water.							
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
5329	2 miles S. of Mayhew.	Yellow sandy loam, 0 to 12 inches.	0.01	1.17	3.13	11.46	14.90	35.47	12.58	16.54	4.58
5331	2 milcs SW. of Mooresville.	Yellow grayish sandy loam, 0 to 12 inches.	.01	2.08	6.52	11.85	10.02	28.13	12.74	20.89	6.45
5332	Subsoil of 5331..	Yellow sandy clay, 12 to 36 inches.	.01	5.46	5.60	7.54	5.70	17.09	8.71	21.21	27.72
5330	Subsoil of 5329..	Yellow sandy clay, 12 to 36 inches.	.01	5.17	2.10	8.92	9.12	21.14	7.51	15.96	29.84

HERNDON STONY LOAM.

Two small areas of the Herndon stony loam were mapped on the Statesville sheet. The larger area is in the extreme northwestern portion of the area near the boundary between Iredell and Alexander counties. The other area is situated in Rowan County, just north of Cleveland, and is locally known as "Young's Mountain." These areas aggregate about 13 square miles. This soil was named after Herndon Mountain, one of the small group of mountains which represent the eastward extension of the Brushy Mountains. The surface of the country occupied by this formation is rough and broken, and consists of a number of small, steep-sided mountains, which range from 300 to 700 feet in elevation above the surrounding country. The soil is a deep sandy loam composed largely of coarse quartz sand, which at a depth of about 12 inches grades into red clay loam and thence into heavy red clay loam. In many places the soil covering is exceedingly shallow, and often consists of only local accumulations or pockets of earth among the large boulders that are thickly strewn over the ground. In places the soil somewhat resembles the surface soil of the Durham sandy loam, except that the sand is much coarser and contains a much greater number of stones. It is not a strong soil, on account of its light texture and the danger on the steep slopes from washing and gullyng, and is not generally desired by farmers on account of the difficulty experienced in its cultivation. The quantity

of stones on the surface varies from 40 to 90 per cent, ranging in diameter from 4 inches to several feet. Wheat, rye, corn, and oats are the principal crops, but the yields are always light. Some good crops of tobacco have been raised on this land, and farmers living in the neighborhood of Rattlesnake Mountain have found tobacco growing as profitable as in more favorably situated regions. Usually there is a heavy forest growth on these stony soils, and much trouble and inconvenience are often occasioned by the forest fires which annually range through the mountains. The timber growth consists largely of chestnut, with pine, oaks, and poplar. The steep, protected slopes of these small mountains are admirably adapted to the growing of fruit of nearly every description. Apples and peaches, especially, would succeed well, as would all kinds of small fruits and berries. No attempt, however, has been made to develop such an industry in this region.

The following table shows the texture of typical samples of the soil of the Herndon stony loam:

Mechanical analyses of Herndon stony loam.

[Fine earth.]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.		Organic matter and combined water.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.								
5817	2½ miles W. of New Hope.	Stony loam, 0 to 10 inches.	0.01	5.82	11.54	10.51	6.02	16.56	10.90	19.81	18.88	
5818	1½ miles NW. of New Hope.	Sandy loam, 0 to 18 inches.	.01	4.10	7.54	10.18	7.56	21.44	16.28	21.66	9.45	

DAVIE CLAY LOAM.

The Davie clay loam was named for the county where the small area of this type of soil was surveyed. It occupies an area of about 8 square miles in the extreme northeast portion of the Statesville area. The surface is that of the gently rolling upland portions of the Piedmont Plateau. This soil, like the preceding ones, is a deep, residual soil, derived from the breaking down or decomposition of talc schist, which is often weathered to a depth of many feet. This schist is easily decomposed and it is seldom that fragments of it are seen on the surface. Small quartz veins, which traverse the schist in many directions, more successfully resist the erosion, and fragments of quartz are scattered about everywhere on the surface.

The soil is an almost white to a yellowish-gray clay loam, from 3 to 12 inches in depth, with an average depth of 8 inches. There is no

distinct line of demarcation between the soil and the subsoil, but a gradual change from the light-colored clay loam to a friable clay, which is in turn underlain by a red clay at an average depth of 15 inches. Most of the area of this formation is forested, and it was a difficult matter to secure much information regarding the crop productiveness and fertility of this character of soil. In every case it was noted that the timber growth is not so heavy as on the other types of soil that have been described, and it consists chiefly of scrubby oaks and pine. Most farmers consider this a poor soil for general farming purposes, and say that it is difficult to improve. Wheat, corn, and tobacco are the principal crops grown. Wheat averages from 6 to 8 bushels per acre, and corn seldom yields more than 10 bushels per acre. This soil produces about 600 pounds of bright tobacco per acre, which is used principally for plug wrappers. The soil has good natural drainage, and from its texture and general appearance one would be led to think that it might be easily improved. It has been noticed, however, in this area, as in many others where soil surveys have been conducted, that soils derived from rocks rich in iron and magnesium silicates are nearly always poor and unproductive. The sterility of such soils is said to be due to the fact that the rock contains almost none of the elements which would make a fertile soil; hence the soil derived from such rocks must of necessity be barren and unproductive. Chemical examination of such soils, however, fails to reveal any such discrepancy of plant food, and the question is as far from solution as before.

The following table gives mechanical analyses of soils and subsoils of the Davie clay loam:

Mechanical analyses of Davie clay loam.

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.	Organic matter and combined water.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
5441	¼ mile S. of Clarks-ville.	Pale yellow to light gray loam, 0 to 7 inches.	0.01	3.06	1.16	1.94	1.44	4.52	5.10	64.76	17.75
5443	1¼ miles S. of Clarksville.	Pale yellow to light gray loam, 0 to 7 inches.	.01	5.34	Tr.	1.02	.98	8.70	20.36	41.54	20.37
5442	Subsoil of 5441....	Yellow clay loam grading into red clay, 7 to 36 inches.	.....	5.98	Tr.	.90	.76	1.82	2.08	44.88	42.88

MEADOW.

In this area, as in others where soil surveys have been made, the term Meadow has been used to describe tracts of low-lying lands, frequently known as bottom lands, which are found along the principal creeks and rivers. The largest areas of Meadow in the Statesville area are found along Hunting Creek, in Davie County, on the South Yadkin River, and along Third and Fourth creeks and their tributaries.

There are also some strips of this type along the Catawba River, but this river usually has steep, precipitous sides, and is not at the present time, in the greater part of the Statesville area, building up an extensive flood plain. The strips of meadow land along the streams just mentioned occupy the lowest elevation in the entire sheet. In the eastern part of the area many of the strips of meadow land do not exceed in elevation 700 feet above sea level. These lands are usually situated only a few feet above the level of the stream, and are therefore subject to overflow at any season of the year. The meadow soils have always been considered the most valuable tracts of farm land in the entire area, and they command a price much in excess of what their crop-producing value would seem to warrant. Often they are rated at from three to ten times the price paid for good land on the upland, while in many regions the bottom lands have not for the last ten years produced as large crops as have been harvested on the better class of upland soils. These meadow soils alone have been derived, not from the slow decomposition of underlying rocks, but from the gradual accumulation of materials brought down by the streams along which they occur. The soil generally consists of sandy and silty loams, varying in proportion to the strength of the current that originally deposited the material. In many cases the larger strips of Meadow consist of a uniform grade of sand to a depth of 2 or 3 feet, with no change in the texture for miles. Again, the soil may vary in short distances, and change from a fine silt to a coarse sand. These soils are always rich in organic matter, and whatever plant food they may contain is in a readily available condition. They probably possess a greater natural fertility than the upland soils, but there is always the constant menace to the farmers of the complete loss of the crop by overflow. Again, in case of exceptionally heavy freshets, the entire character of the soil may be changed. In the latter part of May, during the course of the survey, there occurred a freshet which in some places deposited a heavy coating of sand over miles of what were considered the very choicest bottom lands. In cases such as this the fields are rendered practically worthless for years to come. Other cases were reported where the soil covering to a depth of 2 feet was entirely washed away by the swift currents of the swollen streams. Corn is the main crop on the bottom lands, and yields are reported which surpass those of the Cecil clay

soil. Cotton is seldom planted on bottom land, and wheat generally makes too heavy a growth of straw and is liable to lodge; besides there is always present the danger of a total loss of the crop on account of heavy freshets. The smaller strips of Meadow along the minor streams are frequently depended upon for the entire hay crop, for they produce large crops of an excellent quality of hay. Along many of the small streams thorough drainage is necessary before cultivation can be attempted. This is usually accomplished by means of open ditches and smaller drains, which must be carefully cleaned after each overflow.

AGRICULTURAL CONDITIONS.

The natural resources in the Statesville area are most abundant. Little more could be desired in the way of easily improved and fertile soils, and timber and water supply; and the opportunities for improvement and advancement along agricultural lines are extensive and worthy of consideration.

Large plantations are seldom found, and there are probably not more than six in the entire area that contain more than 1,000 acres. Many plantations contain from 300 to 400 acres, while from 100 to 200 represent the size of the average farm. Good upland soils will bring from \$10 to \$20 per acre in farms of 100 to 200 acres. In the more hilly sections, and where the poorer types of soil are found, from \$3 to \$5 per acre represents the selling price, and there are some farms that have been sold at even lower prices than these. Tracts of bottom land command much better prices, and in some instances have been known to sell as high as \$100 per acre.

The improvements on the better class of farms consist of a comfortable two-story dwelling house, a barn with sufficient room for the stabling of stock and the storing of farm implements and machinery, and smaller buildings and sheds. On the smaller and poorer farms the buildings are less pretentious. The houses are frequently constructed of logs, and the barns are not so roomy and afford fewer accommodations for the storing of grain and farm implements. The best farming is done, of course, by the landowners who dwell upon and till their own farms. It is estimated that 40 per cent of the land is farmed by tenants on shares, under which arrangement the landlord usually receives two-thirds, or sometimes slightly less, of the crops. Occasionally a stated cash rent per year is asked. Farms are rented only to white tenants, as the negroes rarely have the necessary stock and farm implements to carry on farming operations. Considerable land, however, is rented to colored tenants in parcels of a few acres, the owner furnishing the material and retaining oversight of the crop. The securing of efficient labor has been a difficult and perplexing matter, especially in recent years. The labor is generally colored, but there has been a decided tendency in the last

few years for the negroes to move to the smaller towns, so that it is often a difficult matter to secure help, especially when the crops are ready to be harvested.

One of the most urgent needs of the farmer of this region is more and better farm implements. So inadequate is the supply that it is impossible to properly prepare the land for planting. Probably not more than one-fourth of the farmers own what may be considered a good plow, while the majority use a small, one-horse plow, locally called a "gopher." The use of this implement leaves the seed bed filled with large, unbroken clods, and so shallow that in time of drought, which frequently occurs, the crops must soon succumb. The character of the deep red clay subsoil which underlies so much of the Statesville area makes deep plowing a necessity. If the shallow seed beds, frequently not more than 3 or 4 inches in depth, could be gradually deepened by plowing half an inch deeper each year, until a depth of 1 foot or more of good soil were acquired, the danger from drought would be materially lessened and the crops greatly increased. Deep plowing will also prevent, to a large extent, the destructive washing of the slopes. Disk harrows, for pulverizing the land preparatory to planting, are coming into use among the better class of farmers, and it is to be regretted that their use is not more general.

A constant source of perplexity to the farmers of this region is the fertilizer problem. For generations the forests have been cleared and virgin soils planted to wheat, corn, and cotton without the application of any fertilizer whatever. It frequently occurs that the same crop is planted on the same field year after year, and as the fertility of the field begins to decrease, only limited amounts of fertilizer are applied, until by continuous cropping and insufficient fertilization the productiveness of the soil is so diminished that it can be no longer tilled with profit, and the field is abandoned to grow up in old-field pine, and to store up fertility through vegetable decay against the time when it shall again be cleared for tillage. The abundance and cheapness of land in this region has apparently made this system possible, but it has also prevented the farmer from learning to husband the resources of his soil. To clear land of trees and stumps, where lumber is of little value, is an expensive process, and some of the best farmers have discovered that this may be avoided by the practice of a system of crop rotation. In this climate cowpeas grow readily and have proved to be a cheap and infallible remedy for the exhausted condition of soils. The most profitable method seems to be to mow the peas, plow under the stubble and roots, which contain valuable supplies of nitrogen, feed the peas and vines to stock, and return the manure to the land. When stock is not kept it is considered the wisest plan to plow under the entire crop. Farmers who have tried stock raising all agree that it is profitable, and their farms certainly give evidence that

it is one of the most efficient methods of bringing land to the highest state of productiveness. All the conditions for successful stock raising are here, and this should be a stock-producing section.

In addition to the crops that have been mentioned, sorghum is grown to a considerable extent in this section, as in many other sections of the State. Generally the crop is grown on the small creek bottoms to produce sirup for home consumption, and there are few farms that are not equipped with a small press and vat for extracting and evaporating the juice.

Nearly all the hay that is grown in this region is produced on the small strips of bottom land. In many cases the quality of the hay is fair and makes good feed, but, again, it is coarse and rank, and does not contain a great deal of sustenance. It is to be regretted that there has been so little attention paid to raising hay and grass crops in this section of North Carolina. Bedford County, Va., where a soil survey has shown large areas of soil similar to the soils of this region, was found to be a natural grazing country, where large numbers of cattle are annually fattened, while in addition to the grass that is used for pasturage, fine crops of timothy and orchard grass are harvested each season.

That the Statesville region contains great possibilities along the line of agricultural development can not be questioned when attention is called to some of the successful farming operations that have been carried on there during the past few years. In one section of the area an old abandoned farm was purchased, and in three years, by proper methods of cultivation and the incorporation of a sufficient supply of organic matter and plant food in the soil, the farm was made to pay for itself, and the productiveness of the soil was wonderfully increased. This may be called, perhaps, an exceptional case, but it shows what rational methods will accomplish in the way of building up and increasing the fertility of the soil, as opposed to a system of exhaustive cropping, with continually diminishing yields, and the final abandonment of the land as the sure result. Many of the better and more intelligent class of farmers maintain that if the average farmer cultivated half the land that he attempts to cultivate at the present time, and owned twice his present equipment of farm implements and stock, much better results would be attained.

In connection with the description of the agricultural conditions of this area some mention must be made of the abandonment of lands and the destruction of valuable fields by washing and gulying. Probably 50 per cent of the entire area is occupied by forest growth, and of this amount certainly more than half is grown up in old-field pine, which shows the extent to which abandonment has taken place in this region. After a field has apparently been exhausted, and turned out or abandoned, especially if it is in an exposed position, washing begins

at once and the small gullies deepen and widen from year to year until the field may be ruined, unless some method of prevention is adopted. Many fields were seen where the gullies have a depth greater than 40 feet, and it is said that these were at one time fertile and productive fields. In the course of the survey hundreds, and even thousands, of acres were seen that had at some former time produced good crops. Usually before the washing and gullying has continued many years nature begins to reclaim such abandoned tracts of land. Small pines spring up and a thick mat of brambles and vines tends to hold the easily eroded masses of clay together. Scarcely any of the gullied fields were seen that could not in the course of a few years be entirely reclaimed by a judicious use of ditches and terraces and the filling in of the larger gullies by means of pine boughs and logs. In this connection it may be well to say that many of the reports and accounts of the abandoned and washed land in this section of the South are erroneous and altogether too sweeping in their statements. The majority of the gullied fields can be reclaimed with comparative ease and moderate cost, and in the entire Statesville area no place was seen which had been so deeply gullied that it could not be entirely reclaimed and made productive in a few years.

The central, southern, and eastern portions of the area are quite well supplied with railroad transportation facilities. Main lines of the Southern Railway pass through Statesville and the central portion of the district, as well as through the southeastern corner. Branch lines of this system run from Statesville to Mooresville and through Mocksville. In spite of the number of railroads which traverse the area, there are several farming districts that are 10 miles from a railway station, and in the northwestern corner the absence of railway shipping facilities has been a great hindrance to agricultural development. The wagon roads are hilly in many places, and there has been no systematic attempt to repair the old roads or to establish a better road system. Convict labor is frequently used to grade the main roads. The work usually consists of grading the roadbed by digging ditches and trenches along the roadside, but after the first heavy rain the effects of such work are obliterated. In the summer time the roads dry out and furnish a good, hard, firm roadbed, but during the winter and spring months they are cut deeply, there are frequent miry holes, and heavy hauling is well-nigh impossible.

The local market for truck and fruit is small and unimportant, while transportation by rail to points where markets could be obtained for these crops is costly. In recent years a number of cotton mills have been established, and provide a ready market for the home crops, while numerous furniture factories annually consume large quantities of timber cut in the immediate vicinity.

Another industry that may be mentioned is the extensive root and herb store—the largest in the world—that has been established in Statesville. All sorts of roots and herbs are collected and hauled to market, and in the aggregate the industry nets a considerable sum of money to the people of this section of the State.

On every hand it is the consensus of opinion that agriculture is picking up, and that it is at the present time in better condition than it ever has been before. There has been an improvement in the methods of agriculture, and in almost every small community there are intelligent and successful men who are making rapid and considerable advances in agriculture. These advances have been made along scientific lines of investigation and by closely adhering to business principles. The example of such farmers has been of great benefit to the agriculturists in this section of North Carolina.

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