
Soil Survey

Sumter County South Carolina

By

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SOIL SURVEY OF SUMTER COUNTY, SOUTH CAROLINA

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COUNTY SURVEYED

Sumter County is in the east-central part of South Carolina (fig. 1.) It comprises an area of 681 square miles, or 435,840 acres. It is roughly triangular in outline. The greatest length—east and

¹ The Soil Survey Division was transferred to the Bureau of Plant Industry July 1, 1939.

west—is about 35 miles. Sumter, the county seat, is 40 miles by air line east of Columbia, the State capital, and 85 miles northwest of Charleston.

This county lies in the physiographic division known as the Coastal Plain and represents a section of variable relief. It can be roughly divided into four main topographic or relief divisions: (1) River bottoms and terraces of the Wateree and Santee Rivers, (2) the sand-hill section, (3) the middle Coastal Plain, and (4) flatwoods.

The bottoms lie east of the Wateree and Santee Rivers and parallel the general course of these rivers. The first bottoms range from about $\frac{1}{4}$ to 4 miles in width. In the northern part of the county the bottoms are narrow and are flanked by high well-defined river terraces, but in the southern part the bottoms extend back to the uplands. The terraces begin below Statesburg and

widen considerably, attaining a width of 2 miles, as they approach the northern county line.

The bottoms of the Wateree and Santee Rivers are covered with brush and trees and are subject to frequent overflows. During the winter they are nearly always covered with water and represent a near-swamp condition. The terraces are

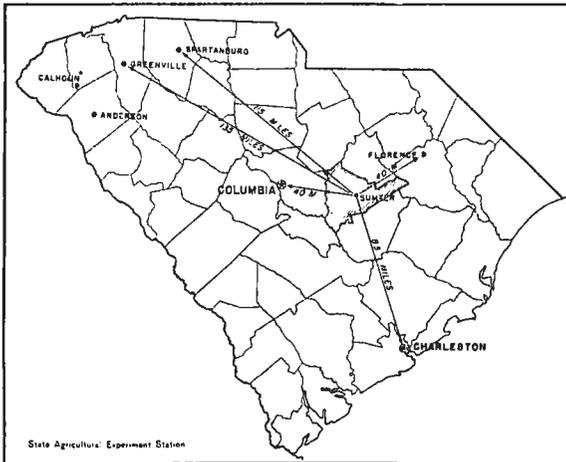


FIGURE 1.—Sketch map showing location of Sumter County, S. C.

high and overflows on them are very rare. They occupy level to undulating country and represent some of the best agricultural lands in the county.

One of the most conspicuous features of the county is a ridge or divide known as the sand-hill section. This extends along the upper part of the Santee River and the lower reaches of the Wateree River, in a northerly direction, beyond Statesburg, and then swings in a northeasterly direction to and beyond Hillcrest School, flanking the watershed of the Wateree River, which extends farther eastward in this section. The sand-hill section is hilly and broken in the central part and becomes smoother toward the south and the northeast. In the early days it was known as the "High Hills of the Santee." A bench mark near Statesburg gives the elevation above sea level as 372 feet; at Pinckney Crossroads, 360 feet; and at Wedgefield, 250 feet. The sand-hill section slopes to the north and west and for the most part is steep and broken. With the exception of the central part of the ridge, northeast of Statesburg, the slope is in general more gradual as it approaches the uplands.

The middle Coastal Plain, or upland part of the county, occupies an intermediate position between the sand-hill section and the flatwoods. With the exception of a small area near Cane Savannah, the approach to the flatwoods is more gradual and is characterized by large areas of comparatively smooth and undulating country. The city of Sumter, near the western edge of the flatwoods, has an elevation of 169 feet above sea level. Most of the country is open and clear, with here and there patches of forest and brush, and it represents some of the best agricultural land in the county.

The flatwoods section consists of broad flat areas, relieved by a few low ridges and baylike depressions. Most of this country is covered with forest and brush, and farming is more patchlike than in the uplands.

Along the Lynches River, which forms the northeastern boundary of the county, some low terrace land, which is generally utilized for agricultural purposes, occurs in places.

The sand-hill section acts as a drainage divide, and drainage of the northwestern and western parts of the county is effected by the Wateree River, and of the southern, southeastern, and eastern parts by the Pocotaligo, Black, and Lynches Rivers and their tributaries. The smaller streams in the eastern part are much more sluggish than those that flow into the Wateree River, and the larger streams are bordered by large areas of swamps. A perceptible difference in the run-off has been noted since so much drainage work has been done by relief crews. Drainage in the western part in places is excessive, and much damage has been done by erosion, particularly in the part of the sand-hills section bordering the river bottoms and terraces along the Wateree River. Here, the contributing branches have trenched deep ravines, and little or no bottom land has developed until they reach the low bottoms of the Wateree River, where the flow is sluggish and the channels meander by circuitous routes to the river.

The flatwoods generally have been regarded as poorly drained, as the water table nearly always is close to the surface. During the winter of 1933 this was the general condition, but during the same season in 1934 and 1935 this section was comparatively dry, owing to lack of rainfall. At the same time, many large drainage operations were initiated and vast tracts of land were made secure against accumulation of water. A reduction ranging from 3 to 11 feet has been reported in the water table in this section.

At an early date South Carolina was divided into districts, and the first permanent settlement in Sumter District took place about the year 1750. The county was not organized, however, until 1798. The settlers came principally from North Carolina and Virginia. Most of them were of Scotch descent, and a few came directly from Scotland. Negroes were brought in later, and most of them now live in the flatwoods section. The present population, reported as 52,463 by the 1940 census, is composed principally of direct descendants of the early settlers.

An excellent system of public highways extends to all parts of the county and is a great factor in the movement of products to and from the farms. United States Highways Nos. 15, 76, and 521 pass through the county. With Sumter as a hub, concrete roads radiate in all di-

rections. These roads were built several years ago, and at present all but two are connected with State highways. Railroad facilities are supplemented by bus and truck service. The principal railroads are the Atlantic Coast Line Railroad, the Southern Railway, and the Seaboard Air Line Railway. These railroads connect at Sumter, and spurs and branches connect other towns throughout the county.

Sumter, the county seat and largest town, has a population of 15,874. It is 40 miles by highway from Columbia, the State capital, and 85 miles from Charleston. It has important lumber mills, veneer establishments, furniture factories, hosiery mills, and baking companies. Other important trading points are Mayesville, Dalzell, Pine-wood, and Wedgefield.

Sumter County maintains a good school system. Several consolidated schools are located at convenient places. Rural electrification is spreading, and most of the farmhouses have telephones.

CLIMATE

The climate may be described as oceanic, as the proximity of the Atlantic Ocean is probably the controlling influence. The central part of the county is less than 100 miles from the ocean, and the extreme eastern part is much closer.

The winters are short, and most of them are characterized by recurring cold spells of freezing weather, frequently preceded by rain and followed by mild pleasant weather. The temperature never falls below zero. The mildness of the winters probably is due to the Gulf Stream rather than to the southerly location of the county, as the Gulf Stream comes within a few miles of the coast line of South Carolina. The mean winter temperature, as given by the United States Weather Bureau station at Wedgefield, is 47.8° F. An average of only 2.1 inches of snow falls during the year. The summers are long, with periods of hot and oppressive weather. Cool breezes and occasional thundershowers relieve the hotter nights. The mean summer temperature, as reported at the same station, is 78.5°. Some daily temperatures, however, have exceeded 100°.

The mean annual precipitation at Wedgefield is 45.26 inches. This is ample and is well distributed throughout the year. Rainfall is greatest in summer and least in fall.

March 20 is the average date of the latest killing frost, and November 19 is the average date of the earliest, giving an average frost-free season of 244 days, which makes possible the production of a wide and varied range of crops. Frost has been recorded as late as April 17 and as early as November 3.

A slight difference in the climate of the eastern part of the county as compared with that of the high land in the western part is noted by observers. Some crops are said to mature a few days earlier in the eastern part on the well-drained soils. On the other hand, peaches are said to be less affected by late spring frosts in the high lands of the western part.

Most of the small grains, such as oats, wheat, and rye, are sown in the fall, and they make some growth during the winter. In addition to the feed crops grown, the more frost-resistant vegetables, such as collards, turnips, cabbage, lettuce, spinach, onions, radishes, beets, carrots, and celery are produced.

Table 1, compiled from the records of the United States Weather Bureau station at Wedgefield, gives the climatic data.

TABLE 1.—Normal-monthly, seasonal, and annual temperature and precipitation at Wedgefield, Sumter County, S. O.

[Elevation, 249 feet]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1933)	Total amount for the wettest year (1906)
	° F.	° F.	° F.	Inches	Inches	Inches
December.....	47.9	82	6	3.45	0.05	3.60
January.....	46.8	82	6	3.18	2.05	4.91
February.....	48.8	84	3	3.96	5.03	2.41
Winter.....	47.8	84	3	10.69	7.13	10.92
March.....	55.5	95	18	3.10	1.18	5.29
April.....	62.7	95	28	3.23	.86	.94
May.....	71.2	101	41	3.42	2.70	2.75
Spring.....	63.1	101	18	9.75	4.83	8.98
June.....	77.5	101	47	5.34	1.10	13.91
July.....	79.6	105	58	4.90	6.92	9.90
August.....	78.3	105	55	5.69	3.22	10.90
Summer.....	78.5	105	47	15.93	11.24	34.71
September.....	74.5	108	42	4.32	4.67	7.19
October.....	64.2	94	31	2.62	.40	6.33
November.....	54.3	85	21	2.05	1.00	1.44
Fall.....	64.3	108	21	8.99	6.07	14.96
Year.....	63.4	108	3	45.26	29.27	69.57

AGRICULTURAL HISTORY AND STATISTICS

The first people to enter Sumter County were hunters and trappers, or those interested in furs and skins. Later, these were followed by herdsmen, who moved their cattle from place to place as necessity of grazing required. The great forest belts in the lowlands afforded excellent summer grazing, and the flatwoods were more often used in winter, as the cattle could get more grass and the native cane was abundant. Later, dealers bought the cattle from the migrating herdsmen and drove them to Charleston and more distant markets.

The great pine forests attracted lumbermen, and settlement was made in all parts of the county. The early agriculture was of a subsistence type, and production was only enough for home consumption. Lumbering continued to be the most important industry for some time, later giving way to the naval stores industry, and much tar, rosin, and turpentine were produced. Among the early crops were corn, wheat, oats, rice, and indigo. The English Government offered a bounty for the production of indigo, and it became a profitable crop. After the removal of the bounty, during the Revolutionary War, and the growth of East Indian competition, the production of indigo declined, and it was practically abandoned in the early years of the nineteenth century.

Considerable corn was grown, and much of it was exported in the early days. The acreage in corn declined as the acreage in cotton

expanded, until scarcely enough corn was produced for home use and much was imported from the more northern States.

Cotton was introduced in 1785, but its production made little progress until the invention of the cotton gin by Eli Whitney in 1793. With the spread and development of cotton growing, the acute demand for labor was met by the importation of more and more slaves. When the early farmer, or planter as he was called, sold his cotton, he generally bought more slaves and cleared more land. Thus, the individual holdings grew into very large farms or plantations, many of which included more than 3,000 acres. This condition existed until the War between the States, which brought about a radical change in economic conditions. The slaves were freed, and farming began again with hired labor. Lack of capital forced many planters into the one-crop system and initiated the tenant system. Cotton became the principal cash crop after the War between the States, and it was grown almost to the exclusion of other crops. Corn, wheat, oats, and hay were frequently bought with the proceeds of the cotton sales.

The raising of all kinds of livestock was neglected, with the result that little manure was produced and returned to the land. Improvident methods of cropping and tillage reduced production to the minimum, and this paved the way for the widespread dependence on commercial fertilizers.

Gradually the owners of farms and plantations became more or less centralized in towns and cities, and the farms were turned over more and more completely to the tenants. This continued until the lean years of the early nineties, when the price of cotton fell below the cost of production and necessitated a return to greater diversification of crops.

Table 2, compiled from the United States census reports, gives the acreage of the leading crops and shows the general trend of agriculture from 1879 to 1934.

TABLE 2.—*Acreage of the principal crops in Sumter County, S. C., in stated years*

Crop	1879	1889	1899	1909	1919	1929	1934
	<i>Acres</i>						
Corn.....	51, 876	51, 164	71, 020	38, 111	46, 460	38, 573	57, 563
Cotton.....	57, 958	94, 050	93, 981	67, 727	78, 180	61, 452	40, 366
Oats:							
Threshed.....	5, 886	6, 940	8, 759	11, 282	9, 179	3, 223	3, 128
Cut and fed unthreshed.....						9, 191	10, 101
Wheat.....	460	16	705	156	1, 747	571	1, 877
Rye.....	111	59	3	10	130	53	200
Rice.....	1, 952	467	1, 616	43	50	3	80
Dry peas (mostly cowpeas).....			10, 768	11, 453	5, 343	2, 000	14, 322
Dry beans (mostly velvetbeans).....			61	69		369	831
Hay and forage.....	1 4	1 1, 327	4, 047	8, 700	26, 060	11, 005	27, 487
Grains cut green.....			1, 766	7, 436		42	955
Legumes for hay.....					12, 045	8, 370	25, 319
Other tame hay.....			2, 192	997	5, 224	1, 357	1 712
Sweet potatoes.....	2, 191	1, 714	2, 213	1, 199	1, 445	1, 504	2, 107
Tobacco.....	1		1, 129	478	3, 499	2, 992	1, 616
Sugarcane.....		8	333	117		119	126
Sorgo.....		39	288	19	488	54	

¹ Hay only.

² Includes wild grasses.

It will be noted from table 2 that the acreage in cotton reached a maximum in 1889 and declined to less than half that acreage by

1934. The advent of the cotton boll weevil in 1922 may be responsible in part for the reduction. Corn, the next important crop in acreage, occupied its largest acreage in 1899. The acreage in 1934 was only four-fifths of the acreage in 1899, although larger than in 1929. The acreage in oats has increased steadily, and most of this crop is now cut and fed unthreshed. The production of tobacco, initiated in the early nineties, represents an effort of some farmers to offset the losses suffered by the low price of cotton. Not so much tobacco is grown now as in 1919. About the same acreage is planted to sweetpotatoes from year to year. The production of hay and forage crops has increased greatly in recent years.

It would seem from the table that production was most diversified, with a greater proportion of land in use, in 1919. This marks the greatest agricultural development since the early nineties, when the farmers were practically forced to discontinue the one-crop system and resort to greater diversification, and an early disaster was translated into a blessing. The drop from the 1919 acreage may be due in part to the advent of the cotton boll weevil in 1922. Many farms were abandoned, and people generally were discouraged. It was not long, however, until means were found to meet the emergency. By using early-maturing varieties of cotton and forcing growth by adequate cultural methods and fertilization, the production of cotton very nearly recovered between 1925 and 1929. The census of 1935, however, shows a large decrease in the acreage of cotton and tobacco and a corresponding increase in hay crops and legumes in 1934.

The report on the soil survey of Sumter County² in 1907 states that—

In 1899, at the time of taking the last census, Sumter County contained about 899 square miles. Since that time 312 square miles have been cut off and added to Lee County. The census figures relating to agriculture are, therefore, speaking roughly, about 33 per cent too large. They nevertheless give a general idea of the conditions in this county.

The conditions of agriculture differ markedly in different parts of the county. In the western or hill section more important development took place before the war and many old mansions are found there to-day. Their owners had large plantations in the lowlands of the State, but lived here most of the time on account of the more healthful climate. They used the Wateree Swamp for raising large numbers of cattle and hogs. These hills were also considered fine for nearly all kinds of fruits, principally peaches, figs, grapes, and small fruits. After the war agriculture in this section was almost prostrated and many years elapsed before it recovered. During this period of recovery agriculture made steady gains in the more level country, as it was thought that the lands there were more productive on account of their virgin condition and black color. The soils of the hills were subject to erosion and in many places the fields during abandonment had been washed badly, and this tended to retard growth here as compared with the progress in the lowlands. The flat lands were covered with extensive pine forests, which in places were cut for lumber, but in many cases the trees were felled and burned in order to get the land in condition for crops.

Among the crops grown and considered to have commercial possibilities are onions, asparagus, beets, spinach, pimentos, peppers, tomatoes, turnips, and watermelons. Some of these crops have been grown for a long time, but others have been more or less experimental and

² BENNETT, FRANK, TAILBY, G. W., JR., BURGESS, JAMES L., JONES, GROVE B., LATIMER, W. J., and WESTOVER, H. L. SOIL SURVEY OF SUMTER COUNTY, SOUTH CAROLINA. U. S. Dept. Agr., Bur. Soils Field Oper. 1907, 27 pp., illus. 1908.

are now considered suitable for more extensive planting. In 1929, vegetables from 532 acres were harvested for sale. The acreage included 129 acres of green beans, 92 acres of watermelons, 73 acres of tomatoes, and 38 acres of dry onions. By 1934 this acreage increased to 1,446 acres, including 394 acres of green beans, 332 acres of watermelons, and 46 acres of tomatoes. Dry onions and many other vegetables were not reported separately by the 1935 census.

The production of fruits and nuts is undeveloped, although a few commercial orchards are kept and a few nut and fruit trees, grapevines, and berries that seem to thrive in this section are around nearly every farm home. The United States census report for the year 1930 gives the value of these products as \$22,138 in 1929. It reports 21,829 peach trees, 1,512 apple trees, 2,606 pear trees, 441 plum and prune trees, 44 cherry trees, 940 fig trees, 843 grapevines, 6 acres in strawberries, 7 acres in blackberries and dewberries, and a total of 3,930 nut trees, predominantly pecans. Fewer peach, apple, and pear trees and slightly more plum and prune trees and grapevines were reported in 1935. There were 12,508 peach trees, 1,137 apple trees, 1,468 pear trees, 663 plum and prune trees, and 1,560 grapevines in that year.

The 1935 farm census reports 611 horses, 4,977 mules, 7,886 cattle, 205 sheep, 347 goats, 21,188 swine, and 94,208 chickens on farms. Most of the horses and mules are used as work animals on the farms, and a few tractors are used. Practically all of the cattle are of dairy types, although a few Herefords are fed for local markets. Guernsey is the predominating dairy breed, but there are some Jerseys and Jersey grades. The principal breeds of hogs are Poland China, Duroc-Jersey, Hampshire, and Berkshire. Many hogs are fattened and disposed of in nearby and more remote markets. The farmers have found hogs very profitable and readily marketed. Nearly every farmer raises a few hogs for home use, and some raise and fatten large numbers for market. Some poultry, mainly chickens, is raised on all farms. The principal breeds raised for market are Rhode Island Red, Barred Plymouth Rock, and White Leghorn. Most of the chickens are consumed locally, but several times a year carlot shipments are made to relieve the surplus. The Farmers' Exchange furnishes a ready market for eggs the year round.

Table 3 gives the value of certain agricultural products, by classes, as reported by the 1930 census.

TABLE 3.—Value of certain agricultural products, by classes, in Sumter County, S. C., in 1929

Crops	Value	Livestock products	Value
Forest products, for home use and sale.....	\$142,852	Dairy products, excluding home use....	\$100,466
Farm garden vegetables (excluding potatoes and sweetpotatoes) for home use.....	138,098	Poultry and eggs produced.....	230,941
Cereals.....	547,467	Wool shorn.....	206
Other grains and seeds.....	34,306	Total livestock products.....	331,613
Hay and forage.....	128,483	Total agricultural products.....	3,650,034
Vegetables for sale (including all potatoes and sweetpotatoes).....	173,971		
Fruits and nuts.....	22,138		
All other field crops (including cotton and tobacco).....	2,137,106		
Total crops.....	3,324,421		

According to the 1930 Federal census, the total expenditure for fertilizers on 3,556 farms was \$686,145 in 1929, or an average of \$192.95 for each farm reporting such expenditure. Most of the fertilizers used are complete mixtures, in addition to considerable 16-percent superphosphate, sodium nitrate, and sulfate of ammonia. Some hydrated lime is used, but no crushed limestone. The most common complete fertilizer is 4-8-4.³ Many farmers mix their own fertilizer, and formulas differ considerably. This is especially true when the farmers exchange cottonseed for meal and when the spread in prices for ingredients is wide.

Most of the laborers employed on the farms are Negroes, and regular wages range from \$10 to \$15 a month. In addition, the employees are given rations of meat, meal, or flour, provided with a house or quarters, and allotted an acre or more of land for a garden or other purposes. This land is commonly plowed at the expense of the employer. Extra help needed to care for crops or harvesting is paid from 75 cents to \$1 a day. Cotton picking is usually done at various prices a hundred pounds. The 1930 census reports a total expenditure for labor as \$324,766 on 1,378 farms.

In 1935, 4,070 farms were in the county with an average size of 68.8 acres. These farms included 280,048 acres, or 68.6 percent of the total area of the county. Of the land in farms, 147,549 acres were in cropland, 6,171 acres were in plowable pasture, 8,412 acres in woodland pasture, 2,796 acres in other pasture, 107,672 acres in woodland not pastured, and 7,448 acres in all other land in farms.

The 1935 census reports 25.6 percent of all farms operated by owners, 73.5 percent by tenants, and 0.9 percent by managers. Over half of the tenants are cash renters. Rents vary with the value of the farm and buildings and range from \$1.50 to \$3.50 an acre. The other tenants operate under a share system that varies considerably. Under one of the principal plans the tenant receives one-half of the crop and pays one-half of the fertilizer expense or furnishes the work animals. Under another system the landlord furnishes everything and retains two-thirds of the crop.

Most of the farms have a dwelling house, a tenant house, barns, sheds, cribs, and other necessary buildings. Some farmers have tractors and binders, and nearly all have disk and turning plows, sweeps, harrows, and cultivators. Hullers and threshing outfits are generally owned by groups or individuals and hauled about from place to place; and grain, peas, beans, and other crops are threshed for a toll of about one-eighth of the crop. A number of plantations are equipped only with tenant houses, the owner of the property usually living in town. A considerable reduction in land values has taken place during the depression.

SOIL SURVEY METHODS AND DEFINITIONS

Soil surveying consists of the examination, classification, and mapping of soils in the field.

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures, such as those in road or

³ Percentages, respectively, of nitrogen, phosphoric acid, and potash.

railroad cuts, are studied. Each excavation exposes a series of distinct soil layers, or horizons, called, collectively, the soil profile. Each horizon of the soil, as well as the parent material beneath the soil, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone are noted. The reaction of the soil⁴ and its content of lime and salts are determined by simple tests.⁵ Drainage, both internal and external, and other external features, such as relief, or lay of the land, are taken into consideration, and the interrelation of soils and vegetation is studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. On the basis of these characteristics, soils are grouped in mapping units. The three principal ones are (1) series, (2) type, and (3) phase. In places two or more of these principal units may be in such intimate or mixed pattern that they cannot be clearly shown separately on a map but must be mapped as (4) a complex. Areas of land, such as coastal beach or bare rocky mountainsides, that have no true soil, are called (5) miscellaneous land types.

The most important group is the series, which includes soils having the same genetic horizons, similar in their important characteristics and arrangement in the soil profile, and developed from a particular type of parent material. Thus, the series includes soils having essentially the same color, structure, and other important internal characteristics and the same natural drainage conditions and range in relief. The texture of the upper part of the soil, including that commonly plowed, may vary within a series. The soil series are given names of places or geographic features near which they were first found. Norfolk, Ruston, Orangeburg, and Coxville are important soil series in Sumter County.

Within a soil series are one or more soil types, defined according to the texture of the upper part of the soil. Thus, the class name of the soil texture, such as sand, loamy sand, sandy loam, loam, silt loam, clay loam, silty clay loam, and clay, is added to the series name to give the complete name of the soil type. For example, Norfolk sandy loam and Norfolk very fine sandy loam are soil types within the Norfolk series. Except for the texture of the surface soil, these soil types have approximately the same internal and external characteristics. The soil type is the principal unit of mapping, and because of its specific character it is usually the soil unit to which agronomic data are definitely related.

A phase of a soil type is a variation within the type that differs from the type in some minor soil characteristic that may have practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. For example, within the normal range of relief for a soil type, certain areas may be adapted to the use of machinery and the growth of cultivated crops and others may not. Even though there may be no important difference in the soil itself or in its capability for the growth of

⁴ The reaction of the soil is its degree of acidity or alkalinity expressed mathematically as the pH value. A pH value of 7 indicates precise neutrality, higher values indicate alkalinity, and lower values indicate acidity.

⁵ The total content of readily soluble salts is determined by the use of the electrolytic bridge. Phenolphthalein solution is used to detect a strong alkaline reaction.

native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated crops. In such instances the more sloping parts of the soil type may be segregated on the map as phases, even though these differences are not reflected in the character of the soil or in the growth of native plants.

The soil surveyor makes a map of the county or area, showing the location of each of the soil types, phases, complexes, and miscellaneous land types, in relation to roads, houses, streams, lakes, section and township lines, and other local cultural and natural features of the landscape.

SOILS AND CROPS

The soils and agriculture of Sumter County are similar in many respects to those in many of the middle Coastal Plain counties in South Carolina. About 60 percent of the land in this county is in virgin forest, in cut-over forest, or in brush. A considerable part of the second-growth trees will make merchantable timber within the next few years. The main forested areas are in the first bottoms along the Wateree, Santee, Black, and Lynches Rivers, Pocotaligo Swamp, and tributary streams; in the savannas, bays, and depressions; and in the more sandy areas of the county.

The well-drained soils occupy perhaps one-half of the area of the county and have favorable relief for farming operations, except in the more hilly areas, where some of the more rolling or steeply sloping lands that have been under cultivation for a long time have undergone both sheet and gully erosion. Most of the soils have deep surface soils, friable sandy clay subsoils, excellent root penetration, and good moisture-holding capacity.

Sumter County includes large areas of some of the most productive soils in the Coastal Plain and also areas of soil of very low productivity, mainly sands. In areas that have been under clean cultivation, only a little organic matter remains in the soil, except where it has been supplied by man. Most of the well-drained soils never contained a large quantity of organic matter in their virgin condition, and the small quantity was soon dissipated by cultivation. All the soils range from acid to strongly acid in reaction. Leaching and loss of organic matter and mineral plant nutrients are attributed to the warm climate and heavy rainfall, and the leaching gradually reduces the fertility of the soil.

The wide differences in the various soils or groups of soils in the county are closely related to the relief, the drainage conditions, and the underlying parent materials. These conditions cause differences in soils, which are readily recognized by their color, texture, structure, and consistence. Most of the upland soils are underlain by beds of unconsolidated sands, sandy clays, and clays, and the soils have developed through the soil-forming processes from these weathered materials. A possible exception may be the deep sands in the so-called sandhill section, as it seems that these sands were deposited as such and have not been derived from the underlying heavier materials. The first-bottom soils and the soils on terraces along the Wateree and Santee Rivers have been formed from materials brought down from the soils in the Piedmont Plateau and deposited by these streams. The soils on the terraces, or second

bottoms, of the Lynches River are developed from materials washed out of soils in the Coastal Plain and redeposited by the river. The flatwoods section includes rather extensive areas of imperfectly or poorly drained soils. The high water table has impeded normal soil development, and the streams have not cut back into some of these broad flat areas, which maintain the constructional form of the land as laid down by the sea. The red lands, or soils of the Greenville series, have been influenced in their formation, to some extent, by impure limestone formations or marl.

Based on the color and texture of the surface soils, the character of the subsoils, drainage conditions, and adaptation, the large number of soil types and phases in Sumter County have been classed in seven groups, including a group of miscellaneous soils and land types.

(1) Soils with gray surface soils and yellow or yellowish-brown sandy clay subsoils include all the sandy loams and deep phases of the Norfolk, Marlboro, Ruston, Kalmia, and Cahaba series. The Kalmia and Cahaba soils, although they occur on second bottoms and terraces, are included with these well-drained upland soils because they have somewhat similar characteristics.

(2) Soils with gray or reddish-brown surface soils and red sandy clay subsoils comprise all the Orangeburg and Greenville soils. The Orangeburg soils have light-gray or grayish-yellow surface soils and bright-red subsoils, whereas the Greenville soils have reddish-brown or dark-brown surface soils and dark-red heavy sandy clay or clay loam subsoils. Together with the Red Bay and Blakely loamy sands, these soils constitute the so-called red lands of Sumter County.

(3) The gray, brown, or dark-red loamy sands or sands are members of the Norfolk, Ruston, Red Bay, and Blakely series. The color of these sands varies widely and corresponds to differences in their productivity. Norfolk sand and Ruston sand are the least desirable and least productive soils, whereas Red Bay loamy sand and Blakely loamy sand are desirable farming soils.

(4) Soils with gray surface soils and mottled sandy clay or clay subsoils include the Dunbar and Coxville soils. The Coxville soils are naturally imperfectly drained, whereas the Dunbar soils range from imperfectly drained to fairly well drained. The Coxville soils have heavier subsoils than the Dunbar soils.

(5) Soils with black surface soils and mottled sandy clay or sand subsoils include the Portsmouth and Scranton soils. They contain a large quantity of organic matter in the surface soils. These are the only black soils in the county.

(6) Soils with gray or brown surface soils and yellow or reddish-brown clay subsoils on terraces include the Altavista and Wickham soils, which occupy the second bottoms or terraces of the Wateree River. They adjoin the uplands and lie at much higher elevations than the first-bottom land near the river.

(7) Miscellaneous soils and land types include the Hoffman, St. Lucie, Roanoke, Myatt, Congaree, and Congaree-Wehadkee soils, and swamp. These soils were placed in this group because their characteristics are entirely different from the soils in the previously described groups. They comprise some of the most undesirable land in the county, such as Hoffman sandy loam and St. Lucie sand, and also

some of the inherently best soils, particularly Congaree silty clay loam.

A close relation exists between the soils in these groups and the agriculture and the present land use or suitability for use. In Sumter County the soils and climate favor a diversified agriculture. Within the last few years more attention has been given to the growing of subsistence crops and hay crops and the improvement of the land, and some of the farmers are getting away from the one-crop system of growing cotton.

The principal crops are cotton, corn, oats, wheat, tobacco, and hay. These are supplemented by sweetpotatoes, sugarcane, garden vegetables, and fruits. The hay crops are mainly soybeans, velvetbeans, and small grains. These are also soil-improvement crops, whereas crotalaria is grown for soil improvement only. Cotton and tobacco are the principal cash-income crops.

Cotton was introduced in this county about 1785 and has been grown as the chief cash crop since that time. The soils and climatic conditions are favorable for the growing of cotton. Its culture is understood by both the landowners and tenants, and it can be sold at some price at any time or stored and marketed without much deterioration over a period of years. It is the main crop, and very likely it will continue to be the dominant cash crop until some other crop has been introduced that will better meet conditions. Most of the cotton is of good quality and fair length of staple, although some improvement could be made in a more uniform grade of staple.

The tobacco produced is known as the bright flue-cured white burley. The leaf cures to a lemon-yellow color and is used largely for cigarettes and smoking tobaccos. If the price and demand can be maintained, much tobacco can be successfully produced, as large areas of well-drained sandy soils, with yellow sandy clay subsoils, are admirably suited to its production. Norfolk sandy loam and Norfolk fine sandy loam and their deep phases produce the best quality of leaf, although some tobacco is grown on the better drained areas of the Dunbar and Coxville soils.

Pecans are grown in all parts of the county, but mostly in the central part. Peaches also have a wide distribution, but the largest commercial orchards are located in the highlands of the sand-hill section. Both winter and spring truck crops are grown. Spinach, onions, beets, carrots, cabbage, peas, tomatoes, sweet corn, watermelons, beans, okra, and lettuce are grown for local use and outside markets.

To sum up, the agriculture of Sumter County is characteristic of the South Atlantic Coastal Plain. It is a combination of cash, subsistence, and soil-improvement crops, in conjunction with the raising of a few beef cattle, hogs, and poultry. Some diversification was practiced prior to the advent of the boll weevil in 1922, and since that time changes in the farming operations have necessarily been made for the betterment of the farmer. The real possibilities of agriculture have not been fully attained.

In the following pages the soils of Sumter County are described in detail, and their agricultural relationships are discussed; their location and distribution are shown on the accompanying soil map; and their acreage and proportionate extent are given in table 4.

TABLE 4.—*Acres and proportionate extent of the soils mapped in Sumter County, S. C.*

Soil type	Acres	Per-cent	Soil type	Acres	Per-cent
Norfolk fine sandy loam.....	17,280	4.0	Ruston sand.....	13,568	3.1
Norfolk fine sandy loam, deep phase.....	0,208	1.4	Red Bay loamy sand.....	2,176	.5
Norfolk sandy loam.....	16,064	3.7	Blakely loamy sand.....	2,048	.5
Norfolk sandy loam, deep phase.....	7,808	1.8	Coxville fine sandy loam.....	17,152	3.9
Norfolk very fine sandy loam.....	5,632	1.3	Coxville very fine sandy loam.....	14,336	3.3
Marlboro sandy loam.....	1,664	.4	Dunbar fine sandy loam.....	23,872	5.5
Ruston fine sandy loam.....	23,424	5.4	Dunbar very fine sandy loam.....	10,880	2.5
Ruston fine sandy loam, deep phase.....	7,616	1.7	Dunbar sandy loam.....	7,808	1.8
Ruston sandy loam.....	18,240	4.2	Portsmouth fine sandy loam.....	10,624	2.4
Ruston sandy loam, deep phase.....	8,000	1.8	Portsmouth loam.....	7,360	1.7
Kalmia coarse sandy loam.....	832	.2	Portsmouth fine sand.....	7,616	1.7
Kalmia fine sandy loam.....	1,088	.2	Seranton loamy sand.....	1,408	.3
Cahaba sandy loam.....	448	.1	Altavista fine sandy loam.....	6,336	1.5
Orangeburg sandy loam.....	7,424	1.7	Altavista very fine sandy loam.....	3,584	.8
Orangeburg sandy loam, deep phase.....	3,072	.7	Wickham sandy loam.....	6,272	1.4
Orangeburg sandy loam, steep phase.....	6,784	1.6	Wickham very fine sandy loam.....	832	.2
Orangeburg fine sandy loam.....	3,008	.7	Wickham loam.....	1,408	.3
Orangeburg fine sandy loam, deep phase.....	576	.1	Hoffman sandy loam.....	5,632	1.3
Greenville sandy loam.....	4,032	.9	Hoffman sandy loam, smooth phase.....	3,648	.8
Greenville fine sandy loam.....	1,856	.4	St. Lucie sand.....	448	.1
Greenville fine sandy loam, eroded phase.....	1,600	.4	Roanoke fine sandy loam.....	2,880	.7
Greenville fine sandy loam, shallow phase.....	676	.1	Roanoke silt loam.....	2,560	.6
Norfolk loamy sand.....	3,712	.9	Myatt fine sandy loam.....	2,880	.7
Norfolk loamy fine sand.....	4,480	1.0	Congaree silty clay loam.....	18,816	4.3
Norfolk sand.....	16,768	3.9	Congaree Wehadkee silty clay loams.....	35,840	8.2
Ruston loamy sand.....	12,928	3.0	Swamp.....	37,696	8.7
Ruston loamy fine sand.....	7,040	1.6			
			Total.....	435,840	100.0

SOILS WITH GRAY SURFACE SOILS AND YELLOW OR YELLOWISH-BROWN SANDY CLAY SUBSOILS

Soils with gray surface soils and yellow or yellowish-brown sandy clay subsoils include Norfolk fine sandy loam; Norfolk fine sandy loam, deep phase; Norfolk sandy loam; Norfolk sandy loam, deep phase; Norfolk very fine sandy loam; Marlboro sandy loam; Ruston fine sandy loam; Ruston fine sandy loam, deep phase; Ruston sandy loam; Ruston sandy loam, deep phase; Kalmia coarse sandy loam; Kalmia fine sandy loam; and Cahaba sandy loam. All these soils have dominantly gray, yellowish-gray, or grayish-brown surface soils, are dominantly fine sandy loams or sandy loams, and are mellow and friable. The subsoils are friable and crumbly sandy clays or fine sandy clays, generally extending to a depth ranging from 28 to 40 inches, where they grade into sandy materials more or less mottled and variegated in color. All these soils are naturally well drained, warm early in the spring, have good moisture-holding capacities, and allow easy root penetration. They lie favorably for farming operations and the use of improved farm machinery. They respond readily to fertilization and to the incorporation of organic matter. They have a wide range of crop adaptation, producing some of all the crops grown in Sumter County. The Norfolk, Marlboro, and Kalmia soils are well suited to the production of bright-leaf tobacco.

Norfolk fine sandy loam.—The surface soil of Norfolk fine sandy loam in cultivated fields, to a depth of 4 to 6 inches, consists of light-gray or yellowish-gray fine sandy loam or loamy fine sand. This is underlain by grayish-yellow or pale-yellow fine sandy loam or loamy fine sand, extending to a depth ranging from 12 to 18 inches. The

subsoil is yellow or pale-yellow fine sandy clay that is friable and crumbly and extends to a depth of 30 to 36 inches, where it grades into mottled yellow, gray, and reddish-brown fine sandy clay that is slightly compact but brittle. In forested areas the topmost 1 to 3 inches of the surface soil contains enough organic matter to give it a dark-gray color. Included with this soil as mapped are small areas of Norfolk sandy loam, Norfolk fine sandy loam, deep phase, and small areas of Dunbar soils.

Norfolk fine sandy loam is one of the most extensive agricultural soils in Sumter County. It occurs mainly in the central and eastern parts. The larger areas are near Shiloh, Rose Hill, Concord Church, and Du Bose and northeast of Sumter; and many small areas are scattered throughout the county.

The surface is almost level, undulating, very gently sloping, or gently rolling. Natural surface drainage is good in a few of the flatter areas, which are benefited by open ditches. All this soil lies favorably for farming operations and for the use of all kinds of farm machinery.

Practically three-fourths of Norfolk fine sandy loam at one time has been cleared, but some of the cleared land has been abandoned in recent years. The forest growth on the uncleared areas is mainly second-growth pine, various oaks, and sweetgum. Some longleaf pine grows in places, but practically all of the original longleaf pine has been cut.

About 50 percent of the cultivated land is used for the production of cotton, about 30 percent for corn, and the rest for hay crops, small grains, tobacco, and vegetables. Yields of cotton range from $\frac{1}{2}$ to 1 bale an acre, depending on the quantity of fertilizer applied and the condition of the soil. Usually from 300 to 500 pounds of a 4-8-4 mixture and a side dressing of about 100 to 150 pounds of nitrate of soda are applied. Corn yields from 20 to 35 bushels, depending on the previous use of the land and the quantity of fertilizer used. On some farms no fertilizer is applied to cornland, but a side dressing of 100 to 150 pounds to the acre of nitrate of soda is given. Oats yield from 20 to 45 bushels an acre, and wheat from 15 to 25 bushels. Land devoted to these crops is given a light application of commercial fertilizer at the time of sowing and a top dressing of nitrate of soda at the rate of 100 to 150 pounds an acre in the spring. Tobacco yields from 400 to 1,000 pounds, and from 500 to 800 pounds to the acre of 3-8-6 fertilizer is applied. Hay, consisting of cowpeas and velvetbeans or oats, yields from 1 to $1\frac{1}{2}$ tons an acre, peanuts from $\frac{1}{2}$ to 1 ton, and sweetpotatoes from 100 to 250 bushels. Peanuts are given a light application of fertilizer, usually 300 pounds to the acre of 2-8-4 or 0-12-4. For best results from 300 to 500 pounds an acre of land plaster or a light application of lime is recommended. Asparagus, potatoes, garden vegetables, and Scuppernong grapes do well.

Norfolk fine sandy loam is easy to till, warms early in the spring, and responds readily to the application of fertilizer, to the turning under of leguminous crops, or to the addition of barnyard manure. It can be made one of the most productive soils in the county. Turning under leguminous crops and including legume crops in the rotation more frequently have contributed largely to the improvement

of this soil. It is well suited to growing velvetbeans, soybeans, and Austrian Winter peas.

Norfolk fine sandy loam, deep phase.—Norfolk fine sandy loam, deep phase, differs from the typical soil mainly in having a thicker or deeper surface soil of light-textured fine sandy loam or loamy fine sand over the underlying yellow friable fine sandy clay. The subsoil begins at a depth ranging from 18 to 36 inches. In some places the surface soil and the subsurface layer are lighter in color and texture than the corresponding layers in Norfolk fine sandy loam.

The acreage of Norfolk fine sandy loam, deep phase, is not so large as that of Norfolk fine sandy loam. Representative areas are 2 miles northeast of Shiloh, near Friersons Store, in and northwest of Sumter, and south and southeast of St. Philips Church. Several areas are scattered throughout the eastern and central parts of the county.

Norfolk fine sandy loam, deep phase, has an almost level, undulating, gently sloping, or gently rolling relief and is everywhere exceptionally well drained. Very little sheet erosion has taken place. Practically the same crops are grown, the same cultural methods practiced, and the same quantities of fertilizer applied as for Norfolk fine sandy loam. Yields of crops in general are less than those obtained on the better areas of Norfolk fine sandy loam. This soil produces excellent tobacco, sweetpotatoes, asparagus, and peanuts. In agricultural value it is intermediate between Norfolk fine sandy loam and Norfolk loamy fine sand. Owing to the deeper fine sandy loam surface soil over the sandy clay, green manures and organic matter from leguminous crops leach from the surface soil more readily than from the surface soil of Norfolk fine sandy loam, and the productivity of the deeper soil is more difficult to maintain than is that of Norfolk fine sandy loam. Soil of the deep phase is very absorptive of rain water, easy to till, and can be worked immediately after rains.

Norfolk sandy loam.—The surface soil of Norfolk sandy loam in cultivated fields is light-gray, gray, or dark-gray sandy loam or loamy sand to a depth of 5 to 8 inches. This material grades into light-yellow or grayish-yellow sandy loam or loamy sand, which extends to a depth ranging from 12 to 18 inches. The subsoil is yellow or pale-yellow friable crumbly sandy clay. At a depth of about 3 feet it is underlain by mottled yellow, reddish-brown, and light-gray slightly compact but friable and crumbly fine sandy clay. Included with Norfolk sandy loam as mapped in the eastern part of the county are a few areas of gravelly sandy loam and Norfolk coarse sandy loam. The gravel consists of small white rounded quartz pieces scattered over the surface and mixed with the soil, whereas in the areas of Norfolk coarse sandy loam, coarse sand is noticeable throughout both the surface soil and the subsoil. In wooded areas the topmost 2 or 3 inches of the surface soil contains enough organic matter to make it dark gray or grayish brown.

This is a fairly extensive soil. Some of the larger areas are in Shiloh Township; north of Cane Savannah; near Sunnyside School, Rembert, and Du Bose; and north and southeast of Oswego; and smaller areas are scattered throughout the central and eastern parts of the county.

Norfolk sandy loam lies favorably for farming operations and the use of all kinds of machinery. It has an almost level, undulating, gently rolling, or very gently sloping relief. Locally, it occupies low ridges within areas of some other soil types. It is all naturally well drained, although on the smoother areas open ditches are essential for best conditions of drainage.

About one-half of this soil has been cleared, and most of the rest supports a second-growth forest of pine and oaks, as most of the original merchantable timber has been removed. In recent years a small acreage has been abandoned or is now idle land. Like Norfolk fine sandy loam, about 50 percent is devoted to cotton, 25 percent to corn, and the rest to hay crops, oats, wheat, tobacco, sweetpotatoes, and garden vegetables. Yields of these crops are not quite so large as those obtained under the same cultural treatment and fertilizer practices on Norfolk fine sandy loam. On some farms the yields may be as large or larger, depending on the management of the soil and the individual farmer. Norfolk sandy loam is an excellent soil for the production of general farm crops, as well as for miscellaneous crops, including the legumes.

Norfolk sandy loam, deep phase.—Norfolk sandy loam, deep phase, differs mainly from typical Norfolk sandy loam in the thickness of the surface sandy loam or loamy sand over the sandy clay subsoil. This deep soil was separated from the typical soil because the sandy clay subsoil lies from 18 to 30 inches below the surface. Generally the deep sandy covering is lighter in texture and in some places lighter in color than the surface soil of typical Norfolk sandy loam.

This is a comparatively inextensive soil. The larger areas are northeast of Rembert; northwest of Cane Savannah; north, south, and east of Haynesworth-Ardis Mill; north of Sumter, and northeast of Pinewood; and smaller areas are scattered throughout the central and eastern parts of the county.

Norfolk sandy loam, deep phase, has an almost level, undulating, to gently sloping relief and is everywhere well to excessively drained. In agricultural value it is intermediate between Norfolk sandy loam and Norfolk loamy sand. The same kinds of crops are grown on this soil as on the typical soil, but the yields are lower under the same cultural treatment and fertilizer practices. Early truck crops, tobacco, peanuts, and sweetpotatoes do well on soil of this phase when properly fertilized. Soil of this deep phase, like the deep phase of Norfolk fine sandy loam, cannot be built up so easily or maintained in a state of productivity so readily as soils where the sandy clay subsoil is nearer the surface.

Norfolk very fine sandy loam.—The surface soil of Norfolk very fine sandy loam, to a depth of 4 to 6 inches, consists of gray or light-gray very fine sandy loam, which grades into yellow or pale-yellow very fine sandy loam extending to a depth of 10 to 12 inches. The subsoil is yellow or pale-yellow very fine sandy clay or friable clay loam. At a depth ranging from 28 to 40 inches it gives way to yellow very fine sandy clay, mottled with yellowish brown, reddish brown, and light gray. Both the surface soil and the subsoil contain more fine material than the other soils of the Norfolk series. The subsoil, although

heavier than the surface soil, is friable and crumbly and is easily penetrated by air, water, and plant roots.

This soil has a fairly wide distribution, but does not have a large total area. It occurs chiefly on both sides of the Atlantic Coast Line Railroad southeast and northeast of Sumter and from Brunsons Store southward. Several areas are around Horse Pen Cypress Bay, near Boykins Store, and in other places throughout the south-central and eastern parts of the county.

Norfolk very fine sandy loam lies favorably for farming operations and the use of modern machinery. Its surface ranges from nearly level to slightly undulating and in a few places is very gently sloping. Most of this soil has good surface and internal drainage, although on some of the flatter areas water stands for a short time after heavy rains. Such areas would be benefited by open ditches to carry off the excess water.

About 80 percent of this soil is cleared and used for agricultural purposes, and the rest supports a growth of either longleaf pine or second-growth pine and some scattered oaks. It is used principally for the production of general farm crops.

The yields of cotton range from $\frac{1}{2}$ to $1\frac{1}{2}$ bales per acre, depending on the quantity of fertilizer used and the condition of the soil. Generally from 300 to 600 pounds of a 4-8-4 mixture is applied, and in addition a top dressing of 100 pounds of nitrate of soda in the spring. Corn yields from 25 to 40 bushels an acre; oats, 25 to 40 bushels; wheat, 15 to 30 bushels; sweetpotatoes, 100 to 300 bushels; and tobacco, 500 to 1,200 pounds. Tobacco receives from 500 to 800 pounds of a 4-8-4 or 3-8-6 mixture. Peanuts yield from 1 to $1\frac{1}{2}$ tons an acre, with the aid of only a small quantity of fertilizer and some lime or gypsum. Corn, oats, and wheat are fertilized to some extent and are generally given an application of 100 to 150 pounds of nitrate of soda. The high yields of sweetpotatoes are obtained by the addition of barnyard manure or a heavy application of a high-grade fertilizer. Cowpeas, soybeans, and other leguminous crops do well and produce much hay. This is a very good soil and one that can readily be built up by proper methods of fertilization, by means of leguminous crops together with light applications of lime, or by the addition of barnyard manure.

Marlboro sandy loam.—In cultivated areas, Marlboro sandy loam consists of gray or brownish-gray light sandy loam, 5 to 7 inches thick. This passes into a 2- to 4-inch layer of yellow or brownish-yellow sandy loam or, in places, light-colored sticky sandy loam. The subsoil is deep-yellow or faintly reddish yellow slightly sticky rather heavy sandy loam extending to a depth ranging from 24 to 30 inches. This material grades into brownish-yellow rather heavy sandy clay with yellowish-red or red mottles. As the depth increases, the mottles become more pronounced and shades of brown, yellow gray, and red appear. In virgin areas a small quantity of leaf litter and dark organic matter occurs on the surface, and the topmost 2 or 3 inches of soil is dark gray or grayish brown.

The surface soil of Marlboro sandy loam differs from that of Norfolk sandy loam in that it is heavier and shallower over the sandy clay and is browner. In places where the surface soil is shallow, some of the underlying yellow sandy clay is turned up by the plow. In-

cluded with this soil as mapped are a few small areas of Marlboro fine sandy loam and Marlboro very fine sandy loam. Such areas occur southwest of Oswego, southeast of Plumhaw School, and southwest of Pinewood.

Marlboro sandy loam occupies a small acreage. Some of the larger areas are southwest of Oswego, south of Toumey, and southwest of Pinewood, and a few scattered areas are in the central and eastern parts of the county. The surface of this soil is nearly flat to undulating, and all the soil lies favorably for agricultural operations. Surface and internal drainage are good.

Perhaps more than 90 percent of Marlboro sandy loam is cleared, and the rest supports a growth of longleaf and shortleaf pine together with a few oaks and other hardwoods. This soil is used for the production of the general farm crops and is considered one of the strongest soils in the county.

Cotton, corn, and tobacco are the principal crops, and some wheat, oats, and hay crops are grown. Yields of cotton range from $\frac{3}{4}$ to $1\frac{1}{2}$ bales an acre where from 300 to 600 pounds of a 4-8-4 fertilizer has been applied. A top dressing of nitrate of soda is given to cotton about the time of the second chopping. Tobacco yields from 500 to 800 pounds, and in some places higher yields are reported. Tobacco is fertilized with 600 to 1,000 pounds of 4-8-4 or 3-8-6 an acre. Corn yields from 20 to 50 bushels, depending on the fertilizer applied and on whether or not the corn follows the turning under of a leguminous crop. Fair to large yields of wheat and oats are obtained. Ordinarily these are given a light application of fertilizer in the fall and a top dressing of nitrate of soda in the spring. Cowpeas, soybeans, and Austrian Winter peas do well on this soil, and garden vegetables grow successfully.

Ruston fine sandy loam.—The surface soil of Ruston fine sandy loam, to a depth of 4 to 6 inches, consists of gray or slightly brownish gray light-textured fine sandy loam or heavy loamy fine sand. In wooded areas the topmost 2 or 3 inches of this soil is dark grayish-brown, owing to the presence of organic matter. Beneath these layers, and extending to a depth of about 10 to 15 inches, is yellow or brownish-yellow fine sandy loam. The subsoil consists of reddish-yellow, yellowish-red, or yellowish-brown friable crumbly fine sandy clay of uniform color and texture, which extends to a depth ranging from 30 to 40 inches. This is underlain by fine sandy clay material, mottled or splotched with light gray, brown, and yellow.

In some respects Ruston fine sandy loam may be considered an intermediate soil, as regards the color of the subsoil, between the Norfolk and Orangeburg soils. Included with the Ruston soil in mapping are small areas of a grayish-brown soil, which occurs in slight depressions. The subsoil in these areas is somewhat variable in color, indicating that drainage is not so good as in the typical soil. In places the soil material of this soil is partly colluvial or has sloughed down from the higher areas of Ruston fine sandy loam. Such areas of soil would now be classed as Ducker loam or Ducker fine sandy loam, which is recognized as a colluvial soil associated with the Ruston and Orangeburg soils.

Ruston fine sandy loam is one of the extensive and important agricultural soils in Sumter County. Representative areas are 1 mile

west of Wilsons Store; along the boundary of Pocatoligo Swamp, especially near Cane Savannah; near Hodges Crossroads; northeast of Sumter; near Dinkins Mill; northwest of Dalzell; northeast of Rimini; and in many other places throughout the eastern and central parts of the county.

This soil occupies almost level, slightly undulating, gently sloping, or gently rolling relief. It lies favorably for farming operations and the use of modern machinery. Both surface and internal drainage are good throughout, except in a few small areas, which can be adequately drained by open ditches.

About 70 percent of Ruston fine sandy loam is used for crops, and the rest supports a mixed growth of trees, mainly second-growth pines and hardwoods. These areas are potentially good agricultural land.

The main crops are cotton, corn, wheat, oats, sweetpotatoes, peanuts, and hay, although garden vegetables, some fruit, and pecans are grown for home use and local markets. Yields of cotton range from $\frac{1}{2}$ to $1\frac{1}{2}$ bales an acre, depending on the quantity of fertilizer used and the condition of the soil. Cotton generally receives from 300 to 600 pounds of a 4-8-4 or, on some farms, a 4-10-4 mixture, and a side dressing ranging from 100 to 200 pounds of nitrate of soda in the spring. Corn yields from 25 to 45 bushels an acre and is commonly given a light application of commercial fertilizer unless a crop of cowpeas or soybeans has previously been turned under. On most farms corn is given a side dressing of 100 to 150 pounds nitrate of soda. Oats yield from 25 to 50 bushels and wheat from 15 to 20 bushels. Land for these crops is generally fertilized at the time of sowing, and an application of nitrate of soda is applied as a top dressing in the spring.

Sweetpotatoes yield from 80 to 150 or more bushels an acre, depending on the fertilizer applied. Peanuts yield from $\frac{1}{2}$ to 1 ton, when given only a light application of fertilizer, and generally some form of lime is applied to the soil. Pecans, peaches, and plums, as well as a wide variety of garden vegetables, do well on this soil.

Ruston fine sandy loam is considered one of the strongest soils of the county for general farm crops. It can be built up to a comparatively high state of productivity, and this is easily maintained by the turning under of leguminous crops, the use of proper rotations, and a liberal application of commercial fertilizer and lime. The soil is mellow and friable, is easy to till, warms early in the spring, and lends itself admirably to the use of both light and heavy farm machinery.

Ruston fine sandy loam, deep phase.—Ruston fine sandy loam, deep phase, differs essentially from typical Ruston fine sandy loam in having a thicker fine sandy loam surface soil of slightly lighter color and lighter texture overlying the typical reddish-yellow or yellowish-brown fine sandy clay subsoil. The depth of this fine sandy loam material over the fine sandy clay ranges from about 16 to nearly 36 inches. In places a few small areas of Ruston loamy fine sand are included.

The deeper soil occupies a much smaller acreage than the typical soil. Some of the larger bodies are west of Sumter, near Concord Church, near Privateer Station, and bordering the Pocatoligo Swamp, especially near Cane Savannah; and smaller areas are scattered throughout the central and south-central parts of the county.

This soil is developed on comparatively low ridges and has a slightly more rolling relief than the typical soil. Both surface and internal drainage are very good.

Ruston fine sandy loam, deep phase, produces the same varieties of crops, with the same cultural treatment and same fertilization, as typical Ruston fine sandy loam, but the yields are slightly smaller. It is a stronger soil than Ruston loamy fine sand and is well suited to growing early vegetables, pecans, peanuts, and sweetpotatoes.

Ruston sandy loam.—The surface soil of Ruston sandy loam consists of a 4- to 6-inch layer of gray or brownish-gray mellow friable sandy loam or loamy sand, grading into yellow or brownish-yellow sandy loam, which extends to a depth ranging from 12 to 18 inches. The subsoil is reddish-yellow, yellowish-red, or yellowish-brown friable crumbly sandy clay. Below a depth ranging from 30 to 40 inches, this material passes into mottled reddish-brown, gray, and yellow sandy clay. A few small areas of soil have a coarse sandy loam texture.

Ruston sandy loam occupies areas chiefly southeast and north of Hudson Crossroads, west and southwest of Mayesville, northwest of Du Bose, near Dalzell, near Rembert, northeast and east of Dinkins Mill, and northwest of Enon Crossroads, and in other places throughout the central part of the county. A few areas of the coarser textured soil occur near Motbridge, 1 mile northeast of Bethel Church, and southeast of Dalzell.

This soil ranges in relief from slightly undulating to gently rolling. It has good surface and internal drainage and warms early in the spring. About 60 percent of the land is farmed, and the rest supports a growth of pines and hardwoods.

Yields of cotton, corn, oats, wheat, peanuts, and sweetpotatoes are about the same, or slightly lower, under the same cultural treatment and fertilization, as those obtained on Ruston fine sandy loam. This is considered one of the good agricultural soils of the county.

Ruston sandy loam, deep phase.—Ruston sandy loam, deep phase, was differentiated from Ruston sandy loam because of the deeper or thicker surface layer of sandy loam or loamy sand, dominantly lighter colored and lighter textured, over the sandy clay subsoil, which is reached at a depth ranging from 18 to 36 inches and is similar to that under typical Ruston sandy loam.

This deep soil is fairly well distributed in the central part of the county. The larger areas are northeast of Dinkins Mill, which is northwest of Sumter.

The relief ranges from slightly undulating to gently rolling and sloping. Both surface and internal drainage are good. Only about 40 percent of this soil is under cultivation, and the rest supports a mixed growth of pine and oak. It is used for the same crops as typical Ruston sandy loam, but yields are slightly lower under the same cultural practice and fertilizer treatment. Peanuts, sweetpotatoes, pecans, and garden vegetables give good returns on this soil where properly fertilized.

Kalmia coarse sandy loam.—Kalmia coarse sandy loam is one of the least extensive soils of the county. It occurs on the terraces along the Lynches and Black Rivers and Scape Oer Swamp. It has a flat or slightly sloping surface and good surface and internal drainage.

Kalmia coarse sandy loam, to a depth of 4 to 6 inches, is gray or yellowish-gray coarse sandy loam. This material passes into light-yellow coarse sandy loam or loamy sand, which extends to a depth ranging from 10 to 20 inches. The subsoil is yellow friable coarse sandy clay, which becomes heavier with depth, and between depths of 30 to 36 inches has some brown, reddish-brown, and gray mottles. Included with this soil as mapped are small areas of **Kalmia sandy loam** and **Kalmia loamy sand**. These do not occupy a sufficiently large acreage to warrant their delineation on the soil map. Such areas occur along the Lynches River south of Hix Landing, and three-fourths of a mile north of Kirby Landing.

About 50 to 60 percent of this soil is cleared, and the rest supports a growth of longleaf pine, shortleaf pine, old-field pine, white oak, red oak, water oak, and live oak. This soil is used mainly for the production of cotton, corn, and oats, and a small acreage is devoted to tobacco. Cotton yields from one-third to one-half bale an acre; corn, 10 to 20 bushels; oats, 15 to 25 bushels; and tobacco, about 500 pounds. Tobacco is given from 300 to 500 pounds of 4-8-4 or 3-8-6 fertilizer, and cotton receives a light application. This soil is less productive and is more difficult to build up and maintain in a state of productivity than the good sandy loams of the uplands.

Kalmia fine sandy loam.—The surface soil of **Kalmia fine sandy loam**, to a depth of 5 to 8 inches, consists of gray or yellowish-gray fine sandy loam or loamy fine sand, grading into grayish-yellow or pale-yellow fine sandy loam, which extends to a depth ranging from 10 to 15 inches. The subsoil is yellow friable fine sandy clay, extending to a depth ranging from 24 to 36 inches, where it is underlain by mottled or splotted gray, brown, and yellow fine sandy clay or heavy fine sandy loam. Included with this soil as mapped are a few small areas of **Kalmia silt loam** and **Leaf silt loam**. The former differs from **Kalmia fine sandy loam** in that surface soil is darker and heavier. The included areas of **Leaf silt loam** have a dark-gray surface soil and a mottled yellow and gray heavy clay subsoil. The mottles are red in the lower part of this layer.

Kalmia fine sandy loam is one of the less extensive soils of the county. It occurs in the extreme eastern part on the second bottoms of the Lynches River. The surface is almost level to undulating, and drainage is fair to good. This soil has slightly higher agricultural value than **Kalmia coarse sandy loam**. Perhaps one-half of it is under cultivation, and the rest supports second-growth pines together with some hardwoods. This soil is easy to till and can be built up to a fair state of productivity.

Cahaba sandy loam.—The surface soil of **Cahaba sandy loam** consists of gray, grayish-brown, or light-brown sandy loam or loamy sand to a depth of 6 or 8 inches, where it is underlain by pale-yellow or brownish-yellow sandy loam, which extends to a depth ranging from 15 to 20 inches. The subsoil is yellowish-red, reddish-yellow, or yellowish-brown moderately friable sandy clay, which, at a depth of about 30 to 36 inches, grades into reddish-yellow or yellowish-red sandy loam or loamy sand. Included with this soil as mapped are a few small areas of **Cahaba loamy sand** east of Motbridge and south of Kirby Landing. A few bodies of **Cahaba fine sand** and **Cahaba coarse sand** are also included.

Cahaba sandy loam is one of the least extensive soils in Sumter County and is restricted to the terraces or second bottoms along the Lynches River. It is not subject to overflow except during very unusual high water.

The surface ranges from almost level to slightly undulating or very gently rolling. Most of this soil is well drained, although a few small depressions are poorly drained.

Nearly all of this soil is used for the production of cotton, corn, oats, and hay crops. Yields of cotton range from $\frac{1}{2}$ to 1 bale an acre, where from 300 to 500 pounds of a 4-8-4 fertilizer have been applied. Corn yields from 20 to 30 bushels; oats, from 20 to 30 bushels; and cowpeas or soybean hay, 1 to $1\frac{1}{2}$ tons. Cahaba sandy loam is a fairly good agricultural soil and responds readily to the turning under of leguminous crops and to the application of fertilizers.

SOILS WITH GRAY OR REDDISH-BROWN SURFACE SOILS AND RED SANDY CLAY SUBSOILS

Soils with gray or reddish-brown surface soils and red sandy clay subsoils are members of the Orangeburg and Greenville series. The Orangeburg soils have gray surface soils, whereas the Greenville soils have dark-brown or red surface soils. The subsoils of the Orangeburg soils are red or bright-red friable sandy clays, as contrasted with the dark-red heavy sandy clay or clay loam developed in the Greenville soils. The Greenville soils comprise the so-called red lands. All the soils in this group, with the exception of the steep phase of Orangeburg sandy loam, are admirably suited to the production of the staple crops of the county. They are good strong agricultural soils and possess the physical characteristics that render them susceptible to improvement. They are used mainly for the production of cotton, corn, and oats. Some wheat, hay crops, pecans, and peaches are grown.

Orangeburg sandy loam.—In cultivated fields, the surface layer of Orangeburg sandy loam consists of light-gray or yellowish-gray light-textured sandy loam or loamy sand, 4 to 6 inches thick. In places where considerable organic matter has been added to the soil, the surface layer is grayish brown or dark gray. A 4- to 10-inch subsurface layer of yellow or brownish-yellow sandy loam overlies the subsoil. The subsoil is red or brick-red friable crumbly sandy clay or heavy sandy clay, which extends to a depth of 4 to 5 feet, where it grades into red sandy loam or loamy sand. In the wooded areas a thin layer of leafmold is on the surface, and the topmost 2 or 3 inches of the surface soil contains enough organic matter to make it grayish brown. In a few places the texture is coarse sandy loam or loamy sand.

Included with Orangeburg sandy loam as mapped are small areas or narrow strips on the breaks, where the surface is rolling or steeply rolling. In such places the surface soil is not of uniform depth and is only a few inches thick over the red sandy clay. Bare spots or galled spots—that is, small areas where the surface soil has been removed, exposing the red sandy clay—are common. Most of these slopes or rolling areas occur in the west-central part of the county southeast of Statesburg, extending toward Hillcrest School. Such

areas are not so productive as typical Orangeburg sandy loam, as they are severely eroded in places and are more difficult to farm.

This soil is fairly well distributed in the west-central part of the county. Some of the largest areas are west of Antioch Church, $1\frac{3}{4}$ miles northeast of Wedgfield, southwest of Dalzell, east of Statesburg, south of Marden Branch, and in other places throughout the western part.

Orangeburg sandy loam has an almost level, undulating, or gently sloping surface. Most of it occupies the broader crests or tops of ridges of the broad interstream areas. It has good surface and internal drainage, because of its relief and the friable character of both the surface soil and the subsoil. In a few areas of sloping to rolling relief drainage is good to excessive, and in some places sheet erosion is noticeable.

Perhaps more than 80 percent of this soil is used for agriculture, and the rest supports a growth of longleaf pine, shortleaf pine, some second-growth shortleaf pine, and a scattered growth of various oaks and other hardwoods. The principal crops grown are cotton, corn, wheat, oats, sweetpotatoes, and hay crops, supplemented by garden vegetables and fruits.

Yields of cotton range from $\frac{1}{2}$ to $1\frac{1}{4}$ bales an acre, depending on the quantity of fertilizer used and the condition of the land. Fertilizer applied to cottonfields ranges from 300 to 600 pounds, or, on some farms, 800 pounds, of a 4-8-4 mixture. In addition to this, from 100 to 150 pounds of nitrate of soda or sulfate of ammonia is applied as a side dressing at the second time the cotton is chopped. Corn yields from 20 to 40 bushels an acre, the larger yields following the turning under of a crop of legumes or the addition of barnyard manure, an application ranging from 200 to 300 pounds of 4-8-4 fertilizer, and a side dressing of 100 to 150 pounds of nitrate of soda. Wheat yields from 10 to 25 bushels and oats from 20 to 40 bushels. Land devoted to these crops is generally given a light application of fertilizer at the time of sowing and a top dressing of 150 to 200 pounds of nitrate of soda in the spring. Sweetpotatoes yield from 75 to 250 bushels an acre, and the land is generally given from 300 to 1,000 pounds of a 4-8-4 or 5-7-5 mixture. Hay crops, mainly cowpeas, velvetbeans, or soybeans, yield from 1 to $1\frac{1}{2}$ or more tons. Peanuts yield from $\frac{1}{2}$ to 1 ton, and the land is given a light application of fertilizer, together with some lime. Garden vegetables and fruits, particularly peaches, Scuppernon grapes, and dewberries, do well.

Orangeburg sandy loam is considered one of the most productive soils in this county for general farm crops, but in some places it has not been properly managed in order to maintain its productivity. This soil possesses good physical characteristics and responds readily to the addition of organic matter, barnyard manures, and fertilizer. It can be built up to a rather high state of productivity, and this level of productivity can easily be maintained by the proper rotation of crops, which includes a leguminous crop. The soil is easy to till and warms early in the spring. Light farm implements can be used for every purpose except turning under green-manure crops.

Orangeburg sandy loam, deep phase.—Orangeburg sandy loam, deep phase, differs essentially from typical Orangeburg sandy loam in that the sandy surface and subsurface layers are slightly lighter in

texture and deeper over the underlying red sandy clay; that is, in the deep phase the red friable sandy clay that is similar to the subsoil of the typical sandy loam is reached at a depth ranging from 20 to 36 inches.

This soil occurs only in small areas, mainly in the west-central part of the county. Some of the larger areas are three-fourths of a mile east and to the southeast of Joshua Church and around Pinckney Crossroads.

Orangeburg sandy loam, deep phase, has undulating to gently sloping relief and is well to excessively drained. Perhaps 60 percent or more of the land is under cultivation. It is used for the same crops as typical Orangeburg sandy loam, but under the same treatment yields are slightly lower. Soil of this deep phase is best suited to light farming or to early truck crops.

Orangeburg sandy loam, steep phase.—Orangeburg sandy loam, steep phase, is variable in color, texture, and depth of the surface soil. In places it represents those areas of Orangeburg sandy loam where the surface soil has been greatly altered, or even entirely removed, by sheet erosion. This soil occurs on the steep slopes and breaks where the gradient ranges from 15 to 40 percent. Both sheet and gully erosion have been active, and in some places gully erosion is so pronounced that small areas of the soil are unsuited for farming.

There is only a small total area of this steep soil. Most of the bodies lie between Wedgefield and Hillcrest School, especially northwest of Pinckney Crossroads, west and southwest of Providence Church, east and southeast of Catchall, and north and northeast of Statesburg. Smaller areas occupy the brakes from the uplands to the river bottoms between Rimini and Brohun Lake.

Only a small proportion of this soil is under cultivation. The greater part of it is covered with forest or brush. Some of the land was once cleared and cultivated, after which it became badly eroded. Then it was abandoned, and it has since been allowed to reforest. The best use for this land is the growing of kudzu or reforestation. When once started, kudzu would check erosion and furnish some grazing.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam is separated from Orangeburg sandy loam because of its finer texture; that is, it contains more fine sand and very fine sand and naturally has a slightly more loamy feel. The subsoil throughout has a large content of fine material.

This soil occurs mainly in the west-central part of the county. The larger areas are west and southwest of Dalzell, near Hillcrest School, south and southwest of Pinckney Crossroads, south and west of Providence Church, and northeast of Wedgefield. These areas have an undulating to gently rolling relief and possess good surface and internal drainage.

About 75 percent of Orangeburg fine sandy loam is cultivated, and the rest supports a growth of shortleaf and second-growth pine with some scattered oaks and other hardwoods. Corn, cotton, oats, wheat, sweetpotatoes, hay crops, and peanuts constitute the principal crops. Garden vegetables, a few pecans, and some fruit are grown also. Cotton yields from $\frac{1}{2}$ to $1\frac{1}{4}$ bales an acre; corn, 30 to 35 bushels; oats, 20 to 45 bushels; wheat, 12 to 15 bushels; sweetpotatoes, 80 to 250

bushels; peanuts, $\frac{1}{2}$ to 1 ton; and hay crops, 1 to 2 tons. Land for these crops is fertilized with about the same quantity and grade of fertilizer as that used on Orangeburg sandy loam.

Under good cultural management this soil produces slightly higher yields than Orangeburg sandy loam. It responds readily to the incorporation of organic matter, which may be done by turning under leguminous crops, adding barnyard manure, and applying fertilizer. It can readily be built up to a high state of productivity and fairly well maintained in this condition under proper management.

Orangeburg fine sandy loam, deep phase.—Orangeburg fine sandy loam, deep phase, differs essentially from typical Orangeburg fine sandy loam in that the red friable sandy clay subsoil lies from 20 to 30 inches below the surface. The surface and subsurface layers are slightly lighter in texture and in many places lighter in color than the corresponding layers of typical Orangeburg fine sandy loam.

This deep soil has an undulating, gently sloping, or slightly rolling surface and is everywhere exceptionally well drained. Only a small total area is mapped, chiefly north of Wedgefield, northeast of Pinckney Crossroads, and southeast of Dinkins Mill.

A fairly large proportion of the land is farmed, and the rest supports a tree growth similar to that on typical Orangeburg fine sandy loam. This soil is used for the same crops, has the same cultural treatment, and is given about the same fertilizer application as the typical fine sandy loam, but crop yields are slightly less. Like all the deeper soils, this soil is a little more difficult to build up and maintain than the typical soil, because the deeper surface soil allows leaching of the organic matter and mineral plant nutrients. It is a good soil for the production of early truck crops, fruit, sweetpotatoes, and peanuts.

Greenville sandy loam.—The surface soil of Greenville sandy loam, locally known as red land, to a depth ranging from 6 to 10 inches, is reddish-brown or dark-brown mellow sandy loam. The subsoil is deep-red or dark-red heavy sandy clay or moderately friable clay, which is firm and slightly compact, and extends to a depth ranging from 4 to 10 feet, where it grades into slightly heavier material, somewhat lighter in color and definitely splotched with brown, yellow, gray, and red. Where this soil borders the Blakely and Red Bay soils, its texture is more sandy and the subsoil more friable. Here and there, small areas of Blakely loamy sand and Red Bay loamy sand are included in mapped areas of Greenville sandy loam.

This is one of the less extensive soils. It occurs chiefly near Wedgefield, west of Manchester, near Statesburg, near Cane Savannah, and northwest of Rimini. The relief ranges from almost level or slightly undulating to gently rolling. Both surface and internal drainage are good. All the land lies favorably for the use of improved farm machinery.

Practically all of Greenville sandy loam is cleared, and the small uncleared areas support a growth of longleaf and shortleaf pine with various oaks and trees that have been planted for shade. This soil is used chiefly for the production of cotton, corn, oats, wheat, and hay crops; and garden vegetables, pecans, and peaches are grown successfully. The yields reported for cotton range from $\frac{1}{2}$ to 1

bale an acre, where from 300 to 500 pounds of 4-8-4 fertilizer has been applied. Generally a side dressing of nitrate of soda is given this crop in the spring. Corn yields from 20 to 40 bushels, with liberal quantities of fertilizer or in places where the crop follows the turning under of a leguminous crop. Wheat yields from 12 to 30 bushels an acre; oats, 20 to 40 bushels; and soybeans, cowpeas, and velvetbeans do well and produce from 1 to 2 tons of hay. Peaches, which are grown on a commercial scale, are of good color and fine quality.

Greenville sandy loam is one of the strong soils of the county for the production of general farm crops. When properly handled it can be built up to a high state of productivity by the turning under of leguminous crops, the practicing of proper crop rotations, and the application of a liberal quantity of fertilizer. Lime is applied to this land when some of the leguminous crops are grown.

Greenville fine sandy loam.—Only small areas of Greenville fine sandy loam occur in Sumter County. The largest are near Wedgefield, north of Rimini, and northwest of Du Bose. The soil is developed on almost level, slightly undulating, or gently rolling areas, and lies, for the most part, on the crests of the interstream areas. It is naturally well drained. In a few places sheet erosion is noticeable, and in such places the red sandy clay subsoil is exposed.

Greenville fine sandy loam is not essentially different from Greenville sandy loam, except that it is finer in texture; that is, it contains more fine sand and silt throughout the soil mass. Included with this soil as mapped are a few small areas of Red Bay fine sandy loam and Blakely fine sandy loam.

Like Greenville sandy loam, most of this soil has been cleared and is used for the production of the staple crops of the county; and in addition, considerable quantities of onions are produced. Crop yields, fertilizer treatment, and cultural practices on this soil are essentially the same as on Greenville sandy loam, and where any difference occurs it is in favor of the fine sandy loam soil.

Greenville fine sandy loam, eroded phase.—Greenville fine sandy loam, eroded phase, is variable in the color, texture, and thickness of the surface soil. The color ranges from gray through brown to red, the texture from sand to clay loam, and the thickness from 1 to 10 or more inches. The subsoil is similar to that of typical Greenville fine sandy loam, except that in most places the mottled and spotted subsurface layer is nearer the surface. Soil of this eroded phase represents areas of Greenville fine sandy loam where the greater part, and in some places all, of the original fine sandy loam surface soil has been removed. In cultivating these eroded areas, some of the subsoil has been mixed with the original fine sandy loam surface soil, thereby producing a soil with a loam or clay loam texture.

Greenville fine sandy loam, eroded phase, occurs on the slopes leading from the smooth and more gentle uplands down to the stream bottoms. In some places the slopes are rather steep and broken, and in some places gullies have formed. Drainage is good to excessive.

Probably not more than 50 percent of this soil is cleared. At one time practically all of it was under cultivation, but it became seri-

ously eroded, through misuse, later was abandoned, and since has reforested. Most of this eroded soil lies southwest of Wedgefield and in other areas in the west-central part of the county.

Care should be exercised in handling this soil in order to prevent further inroads by sheet erosion and gullyng. The steeper areas should be in forest, and the other areas should be seeded to grasses or kudzu. Some of the soil is farmed, and where it is properly handled, particularly on the smoother areas, fair yields of crops are obtained.

Greenville fine sandy loam, shallow phase.—Greenville fine sandy loam, shallow phase, differs from typical Greenville fine sandy loam in that the fine sandy loam surface soil is much shallower and much more variable in texture and in that the subsoil ranges from only 2 to 3 feet in thickness and consists of dark-brown heavy sticky fine sandy clay. It rests on weathered or, in some places, unweathered light-gray silty clay. The surface soil ranges in color from gray to dark brown, in texture from fine sandy loam to clay loam, and in thickness from about 1 to 10 inches.

This soil occurs northeast of and along Fullers Creek. Some of it has favorable relief, whereas in other places the relief is steep. Particularly is this true of areas bordering the streams or first-bottom lands. Drainage is good to excessive, and sheet erosion is pronounced in some places. On the smoother areas fairly good crops are produced, and some success has been attained in the growing of onions. *Crotalaria* has been used successfully to protect some of the slopes and improve the soil. Kudzu is recommended for this soil.

GRAY, BROWN, OR DARK-RED LOAMY SANDS OR SANDS

Gray, brown, or dark-red sands or loamy sands are members of the Norfolk, Ruston, Red Bay, and Blakely series. These sands and loamy sands show considerable variation in color throughout their profiles. In the Norfolk and Ruston sandy soils the surface layers are dominantly gray or brownish gray and the underlying loamy sands are yellow or yellowish red. In the Red Bay and Blakely loamy sands the surface soils are brown or reddish brown and the subsoils are practically the same color. The loamy sands are slightly more productive and more retentive of fertilizers than the sands. They also have better moisture conditions than do the sands. Compared with the other soils in this group, Red Bay loamy sand and Blakely loamy sand are the most productive, can be built up to a higher state of productivity, and can be more easily maintained in this condition. Norfolk sand and Ruston sand are inherently poor, because they contain only a small quantity of the mineral plant nutrients. They are loose, open, and porous throughout. The loamy sands and sands are more difficult to build up and to maintain in a productive state than the sandy loams previously described.

Norfolk loamy sand.—The surface soil of Norfolk loamy sand consists of gray or grayish-yellow loamy sand from 4 to 6 inches in thickness. It is underlain by yellow or pale-yellow loamy sand, which extends to a depth ranging from 30 to 36 inches, where it grades into sandy loam or light-textured sandy clay.

Perhaps the largest area of this soil occurs at Enon Crossroads; smaller ones are at Haynesworth-Ardis Mill, northwest of Sumter, east of Pinewood, and in many other places throughout the county.

The surface ranges from almost level to very gently rolling or undulating. Both surface and internal drainage are good. This soil has a more favorable moisture-holding capacity than Norfolk sand, and crops do not suffer to the same extent during dry spells.

About 30 percent of Norfolk loamy sand is used for the production of cotton, corn, tobacco, sweetpotatoes, peanuts, and other crops, and the rest supports a scattered growth of longleaf pine, second-growth pine, shortleaf pine, and various oaks. Crop yields on Norfolk loamy sand are not so high as those obtained on Norfolk sandy loam, deep phase, but are higher than those on Norfolk sand. To produce fair yields on this soil, it is necessary to apply a large quantity of commercial fertilizer or barnyard manure, or to turn under considerable organic matter from leguminous crops. It is difficult to build up and maintain the productivity of this soil, but under proper management and fertilization fair yields of peanuts, sweetpotatoes, watermelons, and perhaps early truck crops can be obtained. Most of this land should remain in forest.

Norfolk loamy fine sand.—Norfolk loamy fine sand is fairly well distributed throughout the county. Large areas occur south of Sumter, especially near Dwyer and Bracy Schools, north of Concord Church, east and south of Congruity Church, and elsewhere throughout the central and eastern parts of the county. It has an almost flat, gently rolling, or gently sloping surface, and drainage is good to excessive.

Norfolk loamy fine sand is not essentially different from Norfolk loamy sand, except that it is finer in texture and perhaps possesses more favorable moisture conditions. In places light fine sandy loam occurs about 3 feet below the surface.

Probably 30 percent of this soil is used for agriculture, and the rest supports a growth similar to that on Norfolk loamy sand. Yields of cotton, corn, and tobacco are slightly higher than those obtained on Norfolk loamy sand under the same fertilizer treatment and cultural practices. Peanuts, sweetpotatoes, and watermelons, when properly fertilized, give good returns if the moisture conditions are favorable.

Norfolk sand.—Norfolk sand is an extensive soil. By far the largest area is west of Big Bay in the southwestern part of the county. Areas are northeast and southeast of Big Bay, west and northwest of Harvin School, north of Fultons Crossroads, near Cane Savannah, northeast of Wedgefield, northeast of Dalzell, north of Rembert, and elsewhere.

Norfolk sand consists of gray or grayish-yellow sand, passing into yellow or pale-yellow sand, which extends to a depth of 3 or more feet. In the sand-hill section of the southwestern part of the county the depth of the sand in some places is several feet. In wooded areas the topmost 2- or 3-inch layer is grayish brown, owing to a slight content of organic matter. In most areas the soil is loose, open, and rather incoherent. Included with Norfolk sand as mapped are small areas of fine sand and coarse sand, all of which have about the same value.

Norfolk sand occupies almost level or undulating areas, ridge crests, and gentle slopes. In the southwestern part of the county the relief is dominantly rolling. Water passes through the sand quickly, and the land is everywhere well to excessively drained.

Only a small proportion of Norfolk sand is under cultivation, and the rest supports a scattered growth of longleaf, shortleaf, and second-growth pine on the areas where the clay is nearest the surface. On those areas where the sand is deepest, as in the southwestern part of the county, scrub oaks are the principal growth, and there are a few pine trees. Norfolk sand is used to a small extent for the production of cotton, corn, tobacco, peanuts, and hay crops. Yields of these crops are low, even where a liberal application of fertilizer has been made. The quality of the tobacco is light and chaffy, and the yield is low, compared with that produced on the better soils.

This soil is too light in texture and does not contain enough organic matter and mineral plant nutrients for the production of staple farm crops. Some of the land may be used for growing peaches and dewberries and, when the demand justifies, for growing early truck crops. Under present economic conditions most of Norfolk sand should remain in or revert to forest.

Ruston loamy sand.—The surface soil of Ruston loamy sand consists of gray, brownish-gray, or light-brown loamy sand to a depth of 6 or 8 inches. This passes into yellowish-brown, brownish-yellow, or yellowish-red loamy sand, which becomes slightly sticky within a depth of 3 feet. In some places the lower part of the subsoil is reddish-yellow light sandy loam or sandy clay. The sandy clay everywhere underlies Ruston loamy sand at a depth between 3 and 5 feet. In a few places the texture is loamy coarse sand, and a few small areas of Orangeburg loamy sand and Wickham loamy sand are included with this soil in mapping.

Ruston loamy sand occurs in the central and southwestern parts of the county. Some of the largest areas are west of Sumter, west of Goodwill Church, southeast of Pinckney Crossroads, southeast of Wedgefield, southwest of Manchester, and west of Fultons Crossroads. The relief is gently undulating to gently rolling, and both surface and internal drainage are excellent.

Probably not more than 30 percent of this soil is cultivated, and the rest supports a growth of scrub oak and pine. Where cultivated, it is used for the production of cotton, corn, and leguminous crops. The yields reported for cotton range from one-third to one-half bale an acre; and for corn, 12 to 30 bushels. Yields of hay crops are light. This is not considered a strong soil for general farm crops, but it is better than Ruston sand. Large quantities of fertilizer and proper moisture conditions are essential in order to obtain fair yields of crops on this soil.

Ruston loamy fine sand.—Ruston loamy fine sand occurs south and southwest of Sumter; east and northeast of Toumey; northeast, south, and west of Bracy School; and at other places throughout the central part of the county. It ranges from slightly undulating to gently rolling or gently sloping and has excellent natural drainage throughout.

This soil is not essentially different from Ruston loamy sand, except that it is finer in texture throughout the surface soil and the subsoil, and in some places the lower part of the subsoil contains thin layers of fine sandy clay or fine sandy loam. It is all underlain by fine sandy clay below a depth of 3 feet.

As regards crop production, it is not materially different from Ruston loamy sand. Owing to its fine texture throughout the soil

mass, it has slightly better moisture-holding capacity, and yields of crops are slightly higher than those obtained on Ruston loamy sand.

Ruston sand.—Ruston sand occurs to greater or less extent in all parts of the county, but particularly within a belt extending from Fultons Crossroads northward to a point on Long Branch northeast of Statesburg. It is known as blackjack land.

Ruston sand consists of gray or brownish-gray sand or loamy sand to a depth of 5 to 8 inches. This grades into yellowish-red, yellowish-brown, or reddish-yellow rather loose incoherent sand, which extends to a depth ranging from 3 to more than 5 feet. In some places, particularly near Cane Savannah and Toumey, the texture of this soil is much coarser than typical, but the agricultural value is about the same as that of Ruston sand.

Ruston sand is developed on undulating, gently rolling, or low hilly relief. It is well to excessively drained. Probably not more than 5 percent of this soil is used for farming. Most of it is covered with scrub blackjack oak, with here and there a pine tree. It has some possibilities as a soil suitable for early truck crops, grapes, and peaches. Until the demand for these crops is much greater, the best use for this land is forestry or wildlife refuges.

Red Bay loamy sand.—Red Bay loamy sand occurs in close association with the Greenville soils and Blakely loamy sand. In some places it is rather difficult to distinguish between these loamy sands in color. The surface soil of Red Bay loamy sand consists of reddish-brown or light-red loamy sand, from 8 to 12 inches thick. This grades into red or dark-red slightly sticky loamy sand, which extends to a depth ranging from 3 to 8 feet. Where the lower part of this layer is exposed, the sun bakes or hardens it, and it is inclined to be slightly indurated, although it is very brittle and readily crumbles to loamy sand. A few small areas have a loamy coarse sand texture.

Most of this soil occurs in the west-central part of the county. It is one of the less extensive and agriculturally unimportant soils. It occurs east of Statesburg and northeast and southeast of Wedgefield. It occurs in close proximity to the stream valleys or near the watercourses, and drainage is everywhere well established. The surface ranges from almost level to slightly undulating or very gently sloping.

Probably from 60 to 70 percent of this soil is in cultivation, and the rests supports a growth of longleaf pine, shortleaf pine, and various oaks. Cotton, corn, and leguminous crops, together with some vegetables, pecans, and peaches, are grown. Yields of cotton range from one-third to one-half bale an acre; and of corn, 15 to 30 bushels. Yields of hay crops are generally low. Early truck crops do well. Next to Blakely loamy sand, Red Bay loamy sand is the most productive loamy sand mapped in Sumter County. The soil requires heavy fertilization and needs a large quantity of organic matter.

Blakely loamy sand.—The surface soil of Blakely loamy sand consists of dark-brown or reddish-brown loamy sand to a depth ranging from 6 to 10 inches. This is underlain by dark reddish-brown or brownish-red slightly sticky loamy sand to a depth of 40 or

more inches. Below this is lighter colored, and in some places lighter textured, material, whereas in others the soil material is decidedly heavy. Particularly is this true where this soil borders areas of Greenville soils. In some cultivated fields a thin layer of slightly compact and slightly darker colored loamy sand lies about 6 inches below the surface. Some of the farmers call this an incipient hardpan. It has probably been developed by the plowshare packing the sand as it reaches the same depth year after year. Small areas of Blakely loamy coarse sand and Blakely silty clay loam are included with this soil as mapped. Blakely silty clay loam occurs in the low flat areas or slight depressions northeast and south of Wedgefield. The soil in such places is dark-brown or reddish-brown silty clay loam. It is necessary to drain such areas by open ditches for the production of corn, small grains, and hay crops.

Blakely loamy sand is one of the less extensive soils. It occurs in the west-central part of the county—chiefly northeast and southeast of Statesburg, southwest of Wedgefield, and west of Manchester.

The surface of this soil ranges from flat to very gently sloping, with slight depressions here and there. Drainage is excellent, except in the depressions. Practically all of Blakely loamy sand is cleared and used for agriculture. Cotton, corn, oats, and forage, together with garden vegetables and pecans, are grown. Yields of cotton range from $\frac{1}{3}$ to $\frac{3}{4}$ bale an acre; corn, 15 to 35 bushels; oats, 15 to 30 bushels; and cowpeas and soybean hay, $\frac{1}{2}$ to $1\frac{1}{2}$ tons.

Land devoted to cotton, corn, and oats is given liberal applications of commercial fertilizer and generally a side or top dressing of nitrate of soda. Blakely loamy sand is the most productive loamy sand in the county. It is very easy to till, warms early in the spring, and requires only light farming implements. Heavy applications of fertilizer are essential for fairly good yields. Truck crops do well.

SOILS WITH GRAY SURFACE SOILS AND MOTTLED SANDY CLAY OR CLAY SUBSOILS

Members of the Coxville and Dunbar series make up the group of soils with gray surface soils and mottled sandy clay or clay subsoils. These soils are developed mainly in the eastern and southeastern parts of the county, or the flatwoods section. During the last 2 years several large canals and drainage ditches have been constructed, and the general drainage of these soils has been greatly improved. They are developed on almost level to undulating areas and are naturally poorly to imperfectly drained. The Dunbar soils may be considered intermediate in color, texture, and consistence between the Norfolk soils and the Coxville soils. They are better drained than the Coxville soils and have less heavy subsoils and parent material than those soils. The Coxville soils occur in flatter areas than the Dunbar soils and are characterized by comparatively heavy subsoils containing pronounced red mottlings in the lower part.

Not so large a proportion of the soils of this group is under cultivation as of the better drained sandy loams. These soils are used mainly for growing cotton, corn, and hay crops. On some of the better drained areas bright-leaf tobacco is grown. Where drained, limed, and fertilized, good yields of the staple crops can be obtained. These are potentially good agricultural soils, and more of the land can be brought under cultivation.

Coxville fine sandy loam.—The 6- to 8-inch surface layer of Coxville fine sandy loam consists of gray or dark-gray fine sandy loam and grades into a 4- to 10-inch layer of light-gray fine sandy loam faintly mottled with yellow. The subsoil is light-gray, mottled with yellow or brown, heavy fine sandy clay, which extends to a depth of about 3 feet. In the lower part of the subsoil bright-red mottles or splotches are present. The subsoil grades into light-gray, faintly mottled with yellow or brown, heavy, rather tough fine sandy clay or clay. Included with this soil as mapped are a few small areas of Coxville sandy loam and a few small areas in which the soil has somewhat the characteristics of Dunbar fine sandy loam. These inclusions occupy slightly higher and better drained positions and grade into Dunbar fine sandy loam. A few areas south of Pinewood have a very heavy subsoil of uniformly drab color. They are better drained than the areas of typical Coxville fine sandy loam but have similar value.

Small scattered areas of Coxville fine sandy loam occur in the central and eastern parts of the county. Some of the largest are east of Broadway Station, southwest of Dwyer School, near Mayesville, near Oswego, southeast of Dalzell, northwest of Sunnyside School, and near St. Johns Church.

This soil occupies flats, saucer-shaped depressions, and areas of slightly undulating relief. Natural surface drainage is poor, owing to the flat surface; and internal drainage is very slow, owing to the heavy subsoil.

Probably not more than 20 percent of this soil is cleared and under cultivation, and the rest supports a mixed growth of sweetgum, black gum, swamp pine, water oak, and willow, together with an undergrowth of myrtle, sedges, and some cane. The cultivated areas have been artificially drained by means of open ditches.

Cotton, tobacco, oats, and hay crops are grown, but very little of the land is used for cotton, as the fruit matures late and is exposed to attacks of the boll weevil. Yields of cotton range from $\frac{1}{2}$ to $\frac{3}{4}$ bale an acre; corn, 25 to 30 bushels; oats, 20 to 30 bushels; hay, 1 to $1\frac{1}{2}$ tons; and tobacco, 800 to 1,000 pounds. Tobacco is the important cash crop on this soil. The yields are higher, but the quality is not so good as on the Norfolk soils. Land for tobacco receives from 400 to 600 pounds of 3-8-6 fertilizer, and corn and oats receive light applications of commercial fertilizers. Where drained, limed, and properly treated, Coxville fine sandy loam produces good pasture grasses. Carpet grass does well. This soil is well suited to the production of strawberries, cabbage, turnips, cucumbers, and other truck crops. More of Coxville fine sandy loam could easily be reclaimed for agricultural use.

Coxville very fine sandy loam.—Coxville very fine sandy loam differs essentially from Coxville fine sandy loam in that it is finer in texture and the subsoil is slightly heavier. Included in this soil as mapped are a few small areas of Coxville loam and Coxville silt loam which are not large enough to indicate separately on the soil map. These soils are in general heavier in both the surface soils and subsoils than Coxville very fine sandy loam. Spots of Coxville loam occur 2 miles northeast and 1 mile east of Pinewood, 1 mile north

and 1½ miles northeast of Antioch Church, and 2 miles southeast of Wedgefield.

Coxville very fine sandy loam is distributed throughout the central, eastern, and southeastern parts of the county. The principal areas are southeast of Sumter, near Horse Pen Cypress Bay, southeast and east of Brunsons Store, near Rose Hill, and north of Norwood School. Most areas of this soil are low, flat, and almost level; but some are slightly depressed or very gently undulating. All the land is naturally poorly drained, and the areas now under cultivation have been drained by means of open ditches.

Probably not more than 10 percent of this soil is cleared, and the rest supports a growth of sweetgum, black gum, bay, water oak, willow, and swamp pine, with an undergrowth of myrtle, azaleas, baybushes, fern, sedges, and cane. The cultivated areas are used for practically the same crops and are given the same cultural treatment and fertilization as on Coxville fine sandy loam. The yields are practically the same, or in some places slightly higher, depending on the treatment of the soil. This soil, when drained, limed, and reclaimed for agricultural use, makes fair cropland and produces a wide variety of crops. Perhaps the crops best adapted are pasture grasses, corn, oats, and strawberries.

Dunbar fine sandy loam.—The surface soil of Dunbar fine sandy loam, to a depth ranging from 5 to 8 inches, is gray or dark-gray fine sandy loam. This is underlain by grayish-yellow or pale-yellow fine sandy loam, which extends to a depth ranging from 10 to 18 inches. The subsoil begins as yellow friable fine sandy clay, and below this it consists of mottled gray, brown, and yellow heavy fine sandy clay. At a depth ranging from 28 to 36 inches is heavy fine sandy clay, mottled or spotted with gray, yellow, and red. In wooded areas a thin layer of leafmold, leaves, or pine needles is on the surface, and the topmost 2- or 3-inch layer contains enough organic matter to make it grayish-brown. Included with Dunbar fine sandy loam as mapped are a few small areas where the light-textured surface soil ranges from 18 to 30 inches in thickness. If these areas occurred in sufficiently large acreage, they would be mapped as the deep phase of Dunbar fine sandy loam. Small areas with this deep surface soil occur 1 mile southwest, 3 miles north, and 3 miles southeast of Friersons Store. A few small areas, here and there, have a slightly finer texture in the surface soil.

Dunbar fine sandy loam is rather widely distributed, especially from Sumter southeastward to the county line, northwest of Sumter, near Oswego, and in the extreme eastern part.

Areas of this soil are flat or gently undulating. In general, surface drainage is fair to good in the more gently undulating areas but is imperfect in the flatter areas. Under normal conditions the water table is from 3 to 5 feet below the surface in most places, but recent drainage operations have lowered the water table in places to a depth ranging from 8 to 10 feet. Over the flatter areas open ditches are required for proper drainage of this soil for safe agricultural use.

From 40 to 50 percent of the land has been cleared. Uncleared areas support a mixed growth of longleaf pine, shortleaf pine, and various oaks, with some dogwood, sweetgum, and hickory. Most of the original timber has been cut. Recently a few fields have been taken out of cultivation, or "turned out."

This soil is used mainly for the production of cotton, corn, oats, and hay crops, and some tobacco is grown. A small acreage is devoted to the production of spinach, which is sold to the cannery at Sumter. Garden vegetables are produced for home use, and in some places strawberries, cabbage, beets, carrots, turnips, cucumbers, and sweetpotatoes are grown for sale. The yields of cotton range from $\frac{1}{4}$ to $\frac{3}{4}$ bale an acre, when from 200 to 400 pounds of 4-8-4 fertilizer have been applied. Corn yields from 20 to 35 bushels, depending on the fertilizer used or whether the corn has been preceded by a leguminous crop. Some of the cornland is given a light application of fertilizer and a side dressing of about 100 pounds of nitrate of soda to the acre in the spring. Tobacco ordinarily yields from 500 to 800 pounds, although as much as 1,000 pounds have been obtained. The fertilizer used for tobacco ranges from 300 to 500 pounds to the acre of a 4-8-4 or 3-8-6 mixture. Soybeans and cowpeas yield from 1 to $1\frac{1}{2}$ tons of hay, and oats do fairly well with a light application of fertilizer given at the time of sowing and a top dressing of nitrate of soda in the spring. Sweetpotatoes yield from 80 to 100 bushels, depending on the quantity of fertilizer used.

Dunbar fine sandy loam may be considered intermediate between the Norfolk soils and the Coxville soils. The Dunbar soils are less well drained, are heavier, and are more mottled in the subsoils than the Norfolk soils, but they are not so heavy or so distinctly mottled in the subsoils as the Coxville soils. Tobacco, sweetpotatoes, and peanuts are recommended for the areas having thicker sandy surface soils and the best drained areas. Truck crops grown on a commercial scale receive a heavy application of a 5-7-5 fertilizer mixture. Dunbar fine sandy loam is considered a fairly good agricultural soil and one that can be improved by turning under leguminous crops, by drainage, and by the application of a liberal quantity of lime.

Dunbar very fine sandy loam.—Dunbar very fine sandy loam differs essentially from Dunbar fine sandy loam in being finer in texture and slightly heavier throughout the soil mass. It includes spots of soils that contain a high percentage of silt.

This soil is rather widely distributed in the south-central and eastern parts of the county. It occurs in small areas from Sumter southeastward to the county line and in the extreme eastern part of the county.

Unlike the other Dunbar soils in this county, a considerable part of the land is cleared. Where cultivated, it is used for the production of cotton, tobacco, corn, oats, and hay crops. Crop yields, cultural treatments, and fertilizer applications are practically the same as on Dunbar fine sandy loam.

Dunbar very fine sandy loam does not have quite so good surface drainage as Dunbar fine sandy loam and Dunbar sandy loam. It occupies generally flatter relief. Open ditches are necessary to drain this land for agricultural use. It does not warm so early in the spring as the coarser textured soils. It is potentially a fair agricultural soil and can be made to produce fair yields of the staple farm crops. It is better suited for pasture than Dunbar sandy loam.

Dunbar sandy loam.—Dunbar sandy loam differs from Dunbar fine sandy loam mainly in that both the surface soil and the subsoil are coarser in texture—that is, they contain more medium and coarse

sand. As a result the subsoil in many places is slightly more friable. Included with this soil as mapped are small areas of Dunbar sandy loam, deep phase, also a few areas where the texture is lighter than that of the typical soil. In the areas of coarser textured soil the material includes considerable coarse sand. One area of this coarser textured soil is near Motbridge and one is $1\frac{1}{4}$ miles southeast of St. Martha Church.

Dunbar sandy loam is fairly widely distributed in the central and eastern parts of the county, and most of it occurs in comparatively small areas. Some of the larger bodies are near Rosenwald School, east of Woods Millpond, near Goodwill Church, south of Mayesville, west of Du Bose, southeast of Oswego, and near Pinewood.

Dunbar sandy loam ranges from flat to gently rolling, and in places it occupies low isolated ridges above the flatter country. It has fair surface drainage, but internal drainage is imperfect, as the water table is only a few feet below the level of the ground in the flatter areas. Open ditches are in general use over this soil, except on the more rolling areas. About 50 percent of this soil is cleared, and the rest supports a growth similar to that on Dunbar fine sandy loam.

The crops grown, yields obtained, cultural methods practiced, and fertilizer applied on this soil are similar in many respects to those on Dunbar fine sandy loam. In a few places on the better drained areas, peaches, pears, plums, cherries, and figs, in addition to the general farm crops and garden vegetables, are grown successfully.

SOILS WITH BLACK SURFACE SOILS AND MOTTLED SANDY CLAY OR SAND SUBSOILS

Soils with black surface soils and mottled sandy clay or sand subsoils are members of the Portsmouth and Scranton series. All these soils have black or dark-gray surface soils and mottled sandy clay or sand subsoils. They contain a higher percentage of organic matter than any other soils in the county. They are naturally poorly drained and occupy slight depressions or flat areas in the eastern and southeastern parts. Portsmouth fine sandy loam and Portsmouth loam are good agricultural soils, and with proper drainage and the addition of lime and fertilizer they will produce fair yields of staple crops and such special crops as strawberries, spinach, cabbage, potatoes, and onions.

Portsmouth fine sandy loam.—The surface soil of Portsmouth fine sandy loam consists of dark-gray or black fine sandy loam, ranging from 6 to 10 inches in thickness. This grades into light-gray fine sandy loam or loamy fine sand, from 4 to 8 inches thick. The true subsoil is light-gray, mottled with yellow or brown, fine sandy clay, moderately friable but slightly sticky. Below a depth of 3 feet the brown or yellow mottles practically disappear and the material becomes heavier in texture. In wooded areas a noticeable quantity of well-decomposed organic matter is on the surface; but this, in a large measure, disappears with cultivation.

Portsmouth fine sandy loam is fairly well distributed in many small scattered areas throughout the central and eastern parts of the county. Some of the largest are south, north, and southeast of Sumter; near Toumey; southeast of Brunsons Store; near Cane Sa-

vannah; south and southeast of Dwyer School; and east and southeast of Enon Crossroads.

This soil has an almost level or flat surface, and some of it occupies slight depressions. Some of the slight depressions or bays are covered with water during the wet winter season, and a few remain wet the greater part of the year. Probably not more than 5 percent of this soil is farmed, and the rest supports a growth of sweetgum, black gum, bay, magnolia, oaks, willows, and swamp pine. In some places black gum or cypress constitute practically the entire growth. The undergrowth is dominantly gallberry, baybush, myrtle, and azalea, with some sedges and cane. In a few of the wet areas sedges and cattails are conspicuous.

The cultivated areas have been drained by open surface ditches. Cotton, corn, oats, hay crops, and vegetables for home use are grown. A few small areas are devoted to cotton, and the yields range from $\frac{1}{3}$ to $\frac{1}{2}$ bale an acre. Corn yields from 20 to 25 bushels; oats, 25 to 35 bushels; and hay crops, $\frac{1}{2}$ to 1 ton of hay. Land devoted to corn, cotton, and oats generally is given a liberal application of commercial fertilizer.

For the improvement of this soil the most essential requirement is adequate drainage, followed by applications of lime and fertilizer containing a high percentage of phosphoric acid and potash. This soil, like Portsmouth loam, has a potential agricultural value, and much of it can be brought under cultivation when the demand for farming land is greater.

Portsmouth loam.—The 6- to 10-inch surface soil of Portsmouth loam is dark-gray or black loam. The subsoil is gray loam or heavy sandy loam, faintly mottled with brown. In some places the subsoil is more sandy than the surface soil, whereas in other places the subsoil is as heavy as clay loam or silty clay and is mottled gray and yellow. In wooded areas a black organic layer of vegetable remains, from 2 to 4 inches thick, covers the surface of the mineral soil in most places. This soil as mapped includes a few small areas of Bladen loam, which is gray loam or fine sandy loam, underlain by steel-gray or light-gray, streaked with brownish-yellow, heavy, plastic fine sandy clay or clay. Such areas are too small to delineate on a small-scale map.

Most of Portsmouth loam occurs in the south-central and eastern parts of the county. Some of the areas are west of Hudson Crossroads, in Cow Bay, in Horse Pen Cypress Bay, in Jim Bay, and southeast of Sumter in the vicinity of New Haven Church.

This soil has a flat surface, and in places it occurs in slight depressions or bays. In its natural condition it has poor surface and internal drainage, but some of it has been reclaimed for agricultural use by means of open ditches. In some of the depressions and bays water stands on the surface during the wet winter season, but in the summer and fall the soil in these depressions is dry.

Probably not more than 5 percent of Portsmouth loam is under cultivation. Most of it supports a growth of sweetgum, black gum, bay, magnolia, oaks, willows, and swamp pine. Here and there the growth is exclusively black gum or cypress. The undergrowth is mainly gallberry, baybushes, myrtle, and azaleas, with some sedges and cane.

Portsmouth loam, where cultivated, is used for the production of corn, oats, hay crops, vegetables, and, to a very limited extent, cotton. Corn yields from 25 to 40 bushels an acre; oats, 20 to 40 bushels; and hay, $\frac{1}{2}$ ton. Low yields of cotton are obtained. These crops are given a liberal application of fertilizer. A small acreage of this soil near Sumter is used for the production of vegetables, and considerable success has been obtained with cabbage, beets, carrots, spinach, and English peas; and in some other sections lettuce and celery are successfully grown. The vegetable crops are heavily fertilized with a 5-7-5 mixture. When limed and drained and given a liberal application of fertilizer, this soil will produce fairly good crops of corn, oats, and hay, as well as vegetables.

Portsmouth fine sand.—Portsmouth fine sand is easily distinguished from the other Portsmouth soils by its sand texture. By far the largest areas are in Big Bay, Dial Bay, and Woods Millpond. Elsewhere the soil occurs in small ponds. Most of this soil has an almost level surface and is naturally poorly drained; and, although some of it has a slightly undulating relief and has fair surface drainage, in most places the subsoil is wet or saturated.

Portsmouth fine sand has a black or dark-gray fine sand surface soil, to a depth ranging from 6 to 12 inches. This is underlain by gray or light-gray fine sand, or, in some places, sand, which extends to a depth of 3 or more feet. In a few places a layer of brown compact fine sand is in the subsoil. Such areas are really St. Johns fine sand. Here and there, at a depth of 12 or 15 inches, mottled gray and yellow loamy fine sand is reached. At a depth ranging from 3 to 4 feet, some of the fine sand is underlain by mottled gray and yellow fine sandy clay. The surface soil has a high content of organic matter, but when it is cultivated this soon disappears. Included with this soil as mapped are small areas of coarse sand, loamy sand, and fine sandy loam.

Only a very small proportion of Portsmouth fine sand has been cleared and cultivated. Most of it supports a growth of sweetgum, black gum, bay, willow, swamp pine, and a few water oaks. The undergrowth consists mainly of baybushes, gallberry, and myrtle. This soil is strongly acid in reaction and would require heavy applications of lime and commercial fertilizer. It is considered a soil of extremely low productivity, and perhaps the best use for it is forest.

Scranton loamy sand.—Scranton loamy sand has a 4- to 12-inch dark-gray or almost black loamy sand surface soil with a high content of organic matter. The subsoil is dark-gray, or mottled brown, gray, and yellow, or, in some places, brown, loamy sand, which continues to a depth of 3 or more feet. The thickness and color of the surface soil are more variable in the areas in Sumter County than in some other places in South Carolina. Included with this soil as mapped are hammocks—that is, areas supporting a heavy hardwood growth. The surface soil is gray sand, and it is underlain by mottled gray and pale-yellow sand. Such areas, had they been more extensive, would have been mapped as Blanton sand.

Scranton loamy sand is one of the unimportant and less extensive soils in Sumter County. Small areas are one-half mile west of Broadway Station, $1\frac{1}{2}$ miles east of St. Marks Church, and west of Pinewood.

The land has a favorable relief—that is, most of the surface is almost level to undulating. It is developed in positions along the margin of bays and depressions. Surface drainage is fair, but internal drainage is poor, owing to the high water table rather than to the structure of the subsoil or underlying material.

Only a small area of Scranton loamy sand has been cleared and is now used for agriculture. Some of it is included in cultivated land in order to square or shape a field. Some corn, cotton, and garden vegetables are produced, and the yields of these depend largely on the quantity of fertilizer that has been applied. Areas of similar soil in other places in the flat Coastal Plain have been used for the production of strawberries and early truck crops.

SOILS WITH GRAY OR BROWN SURFACE SOILS AND YELLOW OR REDDISH-BROWN CLAY SUBSOILS, ON TERRACES

The Altavista and Wickham series comprise the group of soils with gray or brown surface soils and yellow or reddish-brown clay subsoils, on terraces. These soils occur in the northwestern part of the county on the second bottoms, or terraces, along the Wateree River. They have been developed from old alluvial materials brought down from soils in the Piedmont Plateau and deposited by the river when it flowed at higher levels. The Wickham soils occupy almost level or undulating to gently rolling areas and are naturally well drained, whereas the Altavista soils are developed mainly on more level areas and in some places are imperfectly drained. All these soils are potentially good agricultural land. Under proper treatment they can be built up to a high state of productivity, and this can be fairly easily maintained through proper rotation, including a leguminous crop. The soils are suited to the production of the staple crops of the county, and some of the highest yields are obtained on the Wickham soils on the State Farm.

Altavista fine sandy loam.—The 6- or 8-inch surface soil of Altavista fine sandy loam consists of gray or moderately dark gray fine sandy loam. This grades into pale-yellow fine sandy loam, which extends to a depth ranging from 10 to 15 inches. The subsoil ranges from yellow heavy fine sandy clay to heavy stiff yellow clay, which, below a depth of 20 to 30 inches, becomes heavier and contains mottles of red, brown, and gray. Included with this soil as mapped are small areas of Altavista sandy loam. This inclusion differs from Altavista fine sandy loam mainly in the texture of the surface layer and the subsurface layer. The acreage of the sandy loam areas is not large enough to warrant their separation on the soil map.

Altavista fine sandy loam occurs one-half mile west of Rembert; near Horatio; near Claremont; south of Dixie; north, south, and east of State Farm; and elsewhere on the terraces, in close association with Wickham very fine sandy loam.

The surface of this soil is almost flat or undulating. The soil occupies the flatter areas on the terraces of the Wateree River. In general, it is fairly well drained, although in some of the flatter areas water stands on the surface for some time after rains. Internal drainage is not well established, particularly in the lower part of the subsoil. Open ditches are necessary on the flatter areas; in fact, most of this soil is benefited by drainage.

Probably 70 percent of Altavista fine sandy loam is under cultivation. Yields of cotton range from $\frac{1}{2}$ to 1 bale an acre; corn, 20 to 40 bushels; oats, 20 to 40 bushels; wheat, 12 to 25 bushels; and hay, mainly soybeans or cowpeas, 1 to 2 tons. These yields depend on the quantity of fertilizer used and the condition of the soil as regards its previous treatment or the turning under of leguminous crops. The soil is benefited by a liberal application of lime.

Altavista very fine sandy loam.—Altavista very fine sandy loam is closely associated with Altavista fine sandy loam in the northwestern part of the county, on the terraces or second bottoms of the Wateree River. It differs from that soil in that it is finer in texture throughout the surface soil and the subsoil. It is flat or gently undulating. The flatter areas are, in some places, imperfectly drained, and open ditches are necessary in order to reclaim this soil for agricultural purposes. The same crops are grown as on Altavista fine sandy loam, and the yields are practically the same or slightly less than those obtained on that soil.

Wickham sandy loam.—The surface soil of Wickham sandy loam, to a depth ranging from 6 to 12 inches, is light-brown, brown, or grayish-brown mellow fine sandy loam. The subsoil is reddish-brown or yellowish-red rather heavy sandy clay or clay, which is moderately friable and extends to a depth ranging from 20 to 36 inches. Below this, the material in most places is lighter in texture and contains some mottles of yellow, red, and, locally, gray. The lower part of the substratum is, in places, sandy and gravelly material.

Wickham sandy loam occurs on the high second bottoms, or terraces, in the northwestern part of the county. Some of the largest areas are south, west, and north of Ellerbee Mill; smaller ones are in the vicinities of Hagood, Horatio, Claremont, and Dixie.

This soil is undulating to gently rolling. The slopes or breaks to the first-bottom soils are fairly steep in some places and gradual in others. Both surface and internal drainage are well established; in fact, the run-off of rain water on the more sloping areas is rapid, and in many places sheet erosion has removed the surface soil, thereby exposing the heavy sandy clay subsoil.

Practically all of this soil has been cleared and is used for agriculture. The few areas not under cultivation support a mixed growth of white, black, and live oaks and shortleaf pine, together with some holly, hickory, sweetgum, and dogwood.

Wickham sandy loam is a strong agricultural soil and is used for the production of cotton, corn, wheat, oats, and hay crops. Yields of cotton range from $\frac{1}{2}$ to 1 bale an acre, and generally from 300 to 500 pounds of 4-8-4 or 3-8-3 fertilizer is applied to the acre. Corn yields from 20 to 40 bushels, depending on the quantity of fertilizer or manure that has been applied. Wheat and oats do well, and cowpeas and soybeans produce from 1 to 2 tons of hay an acre. This soil can be built up to a fairly high state of productivity by protecting it from sheet erosion, by growing and turning under leguminous crops, and by adding a liberal quantity of lime.

Wickham very fine sandy loam.—Wickham very fine sandy loam differs mainly from Wickham sandy loam in having a finer textured surface soil—that is, it contains more very fine sand and silt. The subsoil is almost identical with the subsoil of Wickham sandy loam,

except possibly that it is slightly heavier in texture. This is a soil of very small extent and occurs only in the northwestern part of the county. Some of the larger areas are on the State Farm and west and southwest of Horatio.

This soil is undulating, gently rolling, or gently sloping, and is everywhere well drained. It has about the same agricultural value and is used for the same crops as is Wickham sandy loam.

Wickham loam.—The surface soil of Wickham loam consists of a layer of brown or reddish-brown loam or heavy fine sandy loam 6 to 8 inches thick. This is underlain by reddish-brown or yellowish-red rather heavy fine sandy clay or clay. Generally, at a depth of 30 to 36 inches, some mottles of brown, red, gray, and yellow appear, and the texture is light, approaching heavy fine sandy loam. In places it seems that this soil at one time had a covering of fine sandy loam, but much of this has been washed off, and the rest has been mixed through cultivation with the upper subsoil layer. This has produced a loam or, in some places, a clay loam surface layer.

Wickham loam occurs only in the northwestern part of the county. A part of the State Farm is on this soil. Like Wickham very fine sandy loam, it is on the terraces. Areas are near Hagood, west of Horatio, and west of Claremont. The relief ranges from slightly undulating to gently rolling and gently sloping. Drainage is good to excessive. Sheet erosion, where it has removed most of the surface soil, has produced some galled spots.

Wickham loam is used for practically the same crops as Wickham very fine sandy loam, and crop yields on it are as good as on the very fine sandy loam, and in some places better. The best yields have been obtained where the soil has been fertilized heavily, or where, as on the State Farm, it has been given liberal applications of barnyard manure and leguminous crops have been turned under. The yields of crops on this soil on the State Farm are generally higher than those obtained in other places. This is a good strong agricultural soil and one that can be built up to a rather high state of productivity.

MISCELLANEOUS SOILS AND LAND TYPES

The miscellaneous soils and land types include Hoffman sandy loam; Hoffman sandy loam, smooth phase; St. Lucie sand; Roanoke fine sandy loam; Roanoke silt loam; Myatt fine sandy loam; Congaree silty clay loam; Congaree-Wehadkee silty clay loams; and swamp. The soils and land types of this group do not fit into any of the previously described groups, owing to the wide differences in their characteristics, drainage conditions, and agricultural use. This group includes some of the poorest and some of the inherently best soils in the county. St. Lucie sand is the poorest and can be used only for a scant forest growth, whereas Congaree silty clay loam and Congaree-Wehadkee silty clay loams are inherently fertile soils but are barred from use for crop production because of their position in the first bottoms, which are subject to heavy overflows. The Roanoke soils are naturally poorly drained but occupy a higher position than the Congaree soils, and if reclaimed they would produce good pasture grasses and staple crops. The Hoffman soils are best suited to for-

estry, whereas Myatt fine sandy loam would produce fair pasture grasses. Swamp is saturated or covered with water the greater part of the year, and the reclamation of it is economically impracticable.

Hoffman sandy loam.—Hoffman sandy loam represents a soil condition rather than a definite soil type. In other parts of South Carolina it occurs largely in the sand-hill section. In Sumter County it occupies rather large areas in the northwestern part of the county, particularly near Pisgah, Borden, Hillcrest School, and Grant Hill Church.

The surface soil of Hoffman sandy loam ranges from light-gray to brown loamy sand or light sandy loam. It is underlain by grayish-yellow or pale-yellow sand ranging in thickness from a few inches to almost 3 feet. Beneath this sand is either sandy clay or heavy silty clay with a mottled or splotched appearance, containing some gray or almost white, light-red, reddish-brown, purple, and yellow spots. In places the sandy covering has been removed by erosion, exposing this parent material, and as a result many so-called galled spots are seen here and there. In places the sand is more than 3 feet thick. Some iron crust and a little white quartz gravel are present.

Hoffman sandy loam occupies rolling country; that is, it is developed mainly on slopes and hillsides. This section is known locally as the poor hills. Drainage is excessive, and in many places shallow gullies and galled spots are common.

A little so-called patch farming is practiced on some of the smoother and more uniform areas of this soil, but very low yields are obtained. The best use of this soil is for forestry. Most of it supports a growth of scrub oak, with an occasional longleaf pine. This soil at one time was forested with longleaf pine, but practically all of it has been removed.

Hoffman sandy loam, smooth phase.—Hoffman sandy loam, smooth phase, consists of a 3- to 10-inch layer of gray or yellowish-gray sand or loamy sand. This grades into yellow friable sandy clay, which, at a depth ranging from 20 to 30 inches, passes into heavy silty clay, dominantly gray, but splotched or mottled with red, yellow, and purple. Thin seams of iron crust, some quartz gravel, and pockets of sand are present in the subsoil in some places. This smooth soil occurs in close association with typical Hoffman sandy loam, but it is smoother in relief and has a more uniform covering of sand over the variegated subsoil or parent material.

Most of this soil occurs in the vicinities of Mount Pisgah Church, Bracy Mill, and Joshua Church.

Only small areas of this soil are farmed. The principal crops are cotton, corn, and vegetables. Where the covering of sandy soil is fairly deep and where fertilizers have been applied, fair yields of these crops are obtained. Where the raw subsoil or parent material comes near the surface, this soil is very undesirable for farming. Most of it supports a growth of scrub oak. The best use for the greater part of it is forestry.

St. Lucie sand.—St. Lucie sand consists of an almost white or very light gray sand, underlain, at a depth of about 8 inches, by an almost white or white loose incoherent sand, which continues to a depth ranging from 3 to 20 feet. The topmost 1- or 2-inch layer in places contains enough organic matter to produce the effect

of a salt-and-pepper color. Some of this sand ranges from coarse to fine in texture, and in a few places it contains a little small quartz gravel. In a few small areas the light-gray surface sand is underlain by yellow or light-yellow sand.

St. Lucie sand occurs in very small areas bordering Woods Millpond, Dial Bay, and Big Bay. Other areas are northwest of Manchester and southeast of Wedgefield. This sand occupies almost level or gently sloping areas and low ridges slightly higher than the surrounding country. The relief in some places is ridgelike or somewhat hummocky. The sand, where not held by vegetation, is blown from place to place by the wind. It is all excessively drained. None of it is used for agriculture, but most of it supports a scattered growth of scrub oak and here and there a pine tree. It is considered too porous, too droughty, and too low in fertility for a farming soil. In some places in Florida a sand similar to this is used in the manufacture of concrete blocks for building purposes.

Roanoke fine sandy loam.—The 8- to 10-inch surface soil of Roanoke fine sandy loam consists of gray or dark-gray fine sandy loam containing slight mottles of brown. The subsoil is light-gray, mottled with brown or yellow, and in a few places reddish-brown heavy fine sandy clay or clay, which extends to a depth of about 3 feet. Beneath this is light-gray or steel-gray rather heavy clay or silty clay. Included with this soil in mapping are a few small areas of Roanoke sandy loam. This soil differs from Roanoke silt loam mainly in the texture of the surface soil, and in a few places it lies at a slightly higher elevation.

Roanoke fine sandy loam is developed on the low second bottoms of the Wateree River. It is level to very undulating and is everywhere poorly drained. Overflows may occur from the Wateree River. Some of the largest areas are southwest of Rembert, near Horatio, and northwest of Wedgefield. In many places this soil is closely associated with Congaree-Wehadkee silty clay loams.

None, or very little, of Roanoke fine sandy loam has been cleared and farmed. It supports a growth of various oaks, some hickory, and many other species of hardwoods. If drained and limed, it would produce fair pasture grasses.

Roanoke silt loam.—Roanoke silt loam differs essentially from Roanoke fine sandy loam in that the surface soil is gray or dark-gray silt loam and the subsoil is light-gray, mottled with yellow or rust-brown, heavy silty clay loam or silty clay. It occurs in close association with Roanoke fine sandy loam and Congaree-Wehadkee silty clay loams. Most areas of Roanoke silt loam are flatter and in some places occupy a slightly lower position than areas of Roanoke fine sandy loam.

Roanoke silt loam, like Roanoke fine sandy loam, occurs on the low second bottoms of the Wateree River and some of the large creeks. The largest areas are west of State Farm, southwest of Horatio, west of Cograco, and west and southwest of Dixie.

All this soil is naturally poorly drained and is subject to overflow at times of high water. If it were drained, reclaimed, fertilized, and limed, good pasture grasses could be grown the greater part of the year. It is all in forest, mainly hardwoods.

Myatt fine sandy loam—Myatt fine sandy loam is one of the less extensive soils and is developed mainly in the eastern part of the county on the second bottoms of the Black River, its tributaries, and the Lynches River. It has an almost level to undulating surface, with here and there some slight depressions. It is naturally poorly drained.

The surface layer of Myatt fine sandy loam consists of gray or dark-gray fine sandy loam, ranging from 4 to 8 inches in thickness. This grades into light-gray heavy fine sandy loam, which within a few inches grades into the typical subsoil or in some places rests directly on it. The subsoil is mottled light-gray and yellow, with occasional brown mottles, heavy fine sandy clay, which generally extends to a depth of 3 to 4 feet. Beneath this the color is predominantly light gray. West and southwest of Kirby Landing is an area that has a mottled light-gray, yellow, and red heavy plastic clay subsoil. Included with Myatt fine sandy loam as mapped are a few small areas of Myatt sand and Myatt loam. These inclusions occur west and southwest of Hix and Kirby Landings.

Myatt fine sandy loam is mainly in forest and supports a growth of gum, bay, magnolia, and water oak. Most of the original merchantable timber has been removed. During the rainy seasons this soil is wet on the surface and the entire soil mass is saturated, but during the late summer and fall it becomes dry and hard.

Practically none of the land has been cleared and farmed. A few patches support scant pasturage for work animals and cattle. The best use of Myatt fine sandy loam under present conditions is for forestry, or, if reclaimed, for pasture.

Congaree silty clay loam.—The surface soil of Congaree silty clay loam, to a depth of 6 to 8 inches, is dark-brown or brown silty clay loam. The subsoil ranges from light-brown to dark-brown silty clay extending to a depth ranging from 30 to 40 inches, where it grades into light-brown heavy fine sandy loam or very fine sandy loam. The heavy subsoil is deepest farthest away from the streams or nearest the uplands. Bordering, or in close proximity to, the stream courses in some places, small areas of silt loam or very fine sandy loam are included with Congaree silty clay loam. Such areas generally occupy slightly higher positions and are better drained than the areas of typical silty clay loam. Throughout the surface soil and subsoil, and particularly in the fine sandy loam substratum, very small mica scales are conspicuous.

Congaree silty clay loam occurs in large areas in the first bottoms along the Wateree River, especially in the northwestern part of the county, and extends in narrow areas along the Santee River.

This soil occupies level or, in some places, slightly undulating areas. It is naturally well developed for a soil in the first bottoms, although it is subject to heavy overflows. During long dry spells, when the stream is confined to its channel, this soil becomes dry.

All this soil, except a small area at State Farm, is covered with trees or brush. The growth consists mainly of gum, oak, maple, bay, cypress, and some pine. The area in cultivation at State Farm has been diked to protect it from overflows. The soil is used mainly for the production of corn, and some pastures are maintained. Yields of corn range from about 35 to 50 bushels an acre without the addi-

tion of commercial fertilizer. This is an excellent soil for the production of corn, hay crops, and pasture grasses.

Congaree silty clay loam is naturally the strongest and probably the most fertile soil in Sumter County. Present economic conditions, however, do not warrant the expense of diking, draining, and clearing it for cultivation. It is much better to allow the timber now growing on the land to remain for future use, cutting trees from time to time only as they mature.

Congaree-Wehadkee silty clay loams.—This complex soil, as the name indicates, represents areas where Congaree silty clay loam and Wehadkee silty clay loam are so intricately mixed that it is impracticable to attempt a separation of them on the map. The areas of Congaree silty clay loam are typical of that soil, as previously described. Wehadkee silty clay loam has a gray or light-gray, faintly mottled with brown, silty clay loam surface soil, from 6 to 8 inches thick. The subsoil is steel-gray or light-gray, mottled with yellow or rust-brown, heavy silty clay loam or silty clay.

Congaree-Wehadkee silty clay loams occur in broad continuous areas along the Santee River and northward along the Wateree River to a point west of Statesburg.

The relief is dominantly undulating, but here and there are many almost level areas, sloughs, or depressions. The undulating relief is due to the fact that Congaree silty clay loam occupies fairly well drained areas, whereas Wehadkee silty clay loam occupies the flatter areas—depressions and old river sloughs. Included with this complex are a few small areas of Roanoke silt loam, and such areas have the same relief as typical Wehadkee silty clay loam. Considered as a whole, the elevation of this complex soil is slightly lower than that of Congaree silty clay loam and the Roanoke soils. All areas are subject to rather heavy overflow and, in some seasons of the year, rather frequent overflows.

At present practically all of Congaree-Wehadkee silty clay loams is in forest or brush, consisting mainly of gum, bay, magnolia, water oak, cypress, and, in some places where the timber has been cut, brush. During the early development of this county some of this land was cleared, levees and dikes were built, and the rain water and overflow waters were controlled. Excellent yields, particularly of rice and corn, were obtained. This soil is inherently fertile and would produce good yields of the staple crops if it were drained and reclaimed.

Swamp.—The term "swamp" is applied to those areas of overflowed wet land or land saturated practically the entire year. During the rainy season water stands on the surface in most places, but generally this land dries out in the fall or early winter. The largest areas of swamp border the Black and Pocotaligo Rivers and their tributaries.

Swamp represents a soil condition rather than a definite soil. In texture it ranges from sand or loamy sand to heavy clay and in color from gray to black. The variations in color are due to the varied content of organic matter. In the swamp areas vegetation once flourished, and its decay has contributed to the organic content of the soil material. Mineral materials were brought down by the streams from the higher lying soils. Although in some places swamp

represents low areas or depressions in the flatter parts of the Coastal Plain, such places lie too low to be artificially drained at a reasonable cost. Along some of the smaller streams, swamp represents areas of alluvial soils that are slightly better drained than the areas along the larger streams and have been classed in some counties of South Carolina as "meadow." These areas are slightly above the normal water level of the streams and are better drained than the true swamp. Some pasture for cattle can be had on the better drained areas, and many such areas have been cleared of their tree growth and brush.

None of the true swampland has been cleared and farmed, and in its present condition its main value is for forestry. The forest growth consists chiefly of gum, although in some places there is considerable cypress and in other places some water oak. Most of the merchantable timber has been cut, but in some places the land supports a fairly good stand of second-growth trees. Cane, coarse grasses, and briars constitute the undergrowth. A few areas of swamp afford protection to cattle and some scant pasturage.

Should this land ever be cleared and sufficiently drained by means of canals and lateral ditches, some of it would be productive and well suited to general farm crops, especially corn and hay. Under present economic conditions it is probably better to allow the swamp areas to remain in forest.

LAND USES AND AGRICULTURAL METHODS

The capabilities and conservation of many of the soils in Sumter County have never been fully realized or appreciated by some of the landowners. The favorable physical characteristics of many of the soils render them susceptible to a rather high state of improvement, and their productivity can easily be maintained through proper treatment and by including a leguminous crop in the rotation. Many of the owners and managers of farms in Sumter County are and have been progressive. They have followed the recommendations of the State Agricultural Experiment Station and Extension Service as regards improved varieties, cultural practices, rotation, and fertilization of the soils for the particular crops.

In any well-planned farm program a proper use of the soil is of fundamental importance. The use of the land invariably changes, at least in some detail, along with the changes in the transient social and economic conditions. The agriculture in Sumter County has been based primarily on cotton as the important cash crop. Today the farmers are practicing slightly more diversification than they have in the past. They are being more careful in plowing and cultivating the soils along the contours, particularly in the rolling sections of the county, and they are seeding some of the land to grasses and practicing a more systematic rotation.

Both soil and climatic conditions favor the growth of many different crops. Approximately 60 percent of the land area of this county is in forest or brush. The principal forested and brushy areas comprise the poorly drained land in the flatwoods in the southeastern part of the county, the sand-hill areas in both the southwestern and northwestern parts, the extensive areas of first-bottom soils

and low terraces along the Wateree and Santee Rivers, and smaller areas along the Lynches River. The soils developed in the first bottoms along the Wateree and Santee Rivers are inherently fertile, but they are barred from the production of crops because of heavy overflows. The sands are very low in both organic matter and mineral plant nutrients and therefore are best suited for forestry. Much of the land in brush in the flatwoods section is poorly drained but has a potential value. When there is a demand for more farming land, much of it can be reclaimed for agricultural use.

The soils that dominate the agriculture and on which are produced the greater part of the farm products are the sandy loams of the Norfolk, Ruston, Orangeburg, Greenville, Marlboro, and Wickham series. Even the deep phases of some of these sandy loams and fine sandy loams produce an excellent quality of bright-leaf tobacco and peanuts, and they are used to considerable extent for the production of cotton and other crops commonly grown. These soils are naturally well drained, lie favorably for agriculture and the use of modern machinery, warm early in the spring, are easy to till, and respond readily to the application of commercial fertilizers or to the addition of green-manure crops and barnyard manure.

The best farmers recognize that the soils with gray sandy surface layers and yellow sandy clay subsoils, that is, Norfolk sandy loam and its deep phase, produce the best quality of bright-leaf flue-cured tobacco. It is true, however, that in the southeastern part of the county some tobacco is grown on the Dunbar and Coxville soils, as in this section these are the only soils the farmer has on which to grow tobacco. Cotton has a wider adaptation and is grown to greater or less extent on all the well-drained upland soils and even on some of the soils that have been artificially drained. Some of the more sandy soils are well suited to growing peaches, dewberries, and grapes. The deep sandy loams of the Norfolk, Ruston, and Orangeburg series are well suited to peanuts, sweetpotatoes, and asparagus. The Congaree soils in the first bottoms are capable of producing large yields of corn and pasture grasses, and the Wickham soils on the second bottoms and terraces are considered good general-purpose soils. The red soils, such as the Greenville, Red Bay, and Blakely, are well suited to the production of cotton, and they produce fair yields of corn, oats, and hay crops.

The well-drained upland soils of Sumter County, as their light color indicates, are low in organic matter; in fact, the small quantity of organic matter on the surface and in the topmost 2 or 3 inches of the virgin soil disappears after a few years of clean cultivation. Organic matter was not abundant in any of these well-drained soils prior to their occupancy by man. Some of the poorly drained soils, particularly the Portsmouth, Scranton, and some of the Coxville soils, have a comparatively large content of organic matter. In some places sheet erosion and, to less extent, gulying have taken place, but as a rule erosion is not a serious problem in the management of the soils over the county as a whole. The warm temperature and the heavy rainfall promote leaching, particularly from the loose sandy soils, of organic matter and any soluble plant nutrients.

SOIL ACIDITY, LIMING, AND FERTILIZERS

All the soils in Sumter County, except those that have been limed within recent years, are acid to strongly acid in reaction. Table 5 gives the results of pH determinations on several soils in this county.

TABLE 5.—pH determinations¹ of several soils from Sumter County, S. C.

Soil type and sample number	Depth	pH	Soil type and sample number	Depth	pH
Wickham very fine sandy loam:	<i>Inches</i>		Red Bay loamy sand:	<i>Inches</i>	
244201.....	0-4	4.7	244245.....	0-2	4.9
244202.....	4-17	4.8	244246.....	2-6	4.9
244203.....	17-23	4.9	244247.....	6-12	4.8
244204.....	23-37	4.7	244248.....	12-50	4.8
244205.....	37-60	4.6	244249.....	50-60+	4.9
244206.....	60-70+	4.5	Portsmouth fine sandy loam:		
Orangeburg fine sandy loam:			244262.....	0-2	4.1
244218.....	0-4	4.6	244263.....	2-7	3.6
244219.....	4-18	5.2	244264.....	7-17	4.4
244220.....	18-50	4.7	244265.....	17-35	4.4
244221.....	50-80+	4.7	244266.....	35-43	4.4
Norfolk fine sandy loam:			244267.....	43-60+	4.5
244222.....	0-3	4.4	Congaree silty clay loam:		
244223.....	3-18	5.3	244273.....	0-4	5.1
244224.....	18-30	4.9	244274.....	4-23	4.7
244225.....	30-60	4.5	244275.....	23-37+	4.7
244226.....	60-75+	4.5	Blakely loamy sand:		
Myatt fine sandy loam:			244276.....	0-6	4.9
244239.....	0-2	5.2	244277.....	6-9	4.8
244240.....	2-6	4.7	244278.....	9-42+	4.9
244241.....	6-10	4.3			
244242.....	10-40+	4.2			

¹ Determinations made in the laboratories of the Bureau of Plant Industry by E. H. Bailey, using the hydrogen-electrode method.

From table 5 it will be observed that several of the important soil types are acid to strongly acid.

About the time the soil survey of Sumter County was being made, the South Carolina Agricultural Experiment Station made thousands of soil acidity tests on various types of soil throughout the State. The results of this work also indicate that the soils in this county range from acid to strongly acid—that is, they have a pH value ranging from 6.0 to 4.5. According to this report, the high acidity of the soil is one of the most important factors in the economic utilization of the soils or in agricultural planning. These acid soils can be improved by the judicious use of lime. Every effort should be made to assist each farmer to determine the condition of the land he is farming. In making liming and fertilizer recommendations for various soils, the probability of the presence of toxic elements should be taken into consideration. Soil acidity as such may not be an important factor in the growth of crops adapted to a comparatively wide range of pH values, but indirectly it may have considerable influence on the availability of plant nutrients. In the gray soils of the Coastal Plain, crops may be grown successfully at a comparatively high degree of acidity, on account of the very low content of materials, such as aluminum, that may become soluble in toxic amounts; on the other hand, when such soils are limed heavily, a serious deficiency of manganese for the production of many crops may develop.

Fertilizer and liming practices recommended for South Carolina soils are set forth in table 6.

TABLE 6.—Recommended treatments of sandy loam soils for certain crops ¹

Group	Crops	Treatment recommended for soils with pH values of—				
		< 4.5	4.5-5.0	5.0-5.5	5.5-6.0	> 6.0
1.....	Alfalfa, beets, and sweet-clover	(?).....	(?).....	4,000 pounds limestone per acre broadcast. Neutral fertilizer.	3,000 pounds limestone per acre broadcast. Neutral fertilizer.	2,000 pounds limestone per acre broadcast or 300 to 400 pounds in row with fertilizer. Neutral fertilizer.
2.....	Asparagus, Austrian Winter peas, cabbage, clovers, cucumbers, Dallis grass, lettuce, onions, peanuts, peppers, and spinach.	(?).....	4,000 pounds limestone per acre broadcast. Neutral fertilizer.	3,000 pounds limestone per acre broadcast. Neutral fertilizer.	2,000 pounds limestone per acre broadcast or 300 to 400 pounds in row with fertilizer. Neutral fertilizer.	1,000 pounds limestone per acre broadcast or 200 to 300 pounds in row with fertilizer. Neutral fertilizer.
3.....	Cantaloups, corn, garden peas, lespedeza, lima beans, oats, tomatoes, vetch, and wheat.	4,000 pounds limestone per acre broadcast. Neutral fertilizer.	3,000 pounds limestone per acre broadcast. Neutral fertilizer.	2,000 pounds limestone per acre broadcast or 300 to 400 pounds in row with fertilizer. Neutral fertilizer.	1,000 pounds limestone per acre broadcast or 200 to 300 pounds in row with fertilizer. Neutral fertilizer.	Neutral fertilizer.
4.....	Cotton, cowpeas, potatoes, snap beans, strawberries, tobacco, ³ and velvetbeans.	3,000 pounds limestone per acre broadcast. Neutral fertilizer.	2,000 pounds limestone broadcast or 300 to 400 pounds in row with fertilizer. Neutral fertilizer.	1,000 pounds limestone per acre broadcast or 200 to 300 pounds in row with fertilizer. Neutral fertilizer.	Neutral fertilizer.....	Neutral or acid fertilizer.
5.....	Blueberries, buckwheat, and watermelons.	2,000 pounds limestone broadcast or 300 to 400 pounds in row with fertilizer. Neutral fertilizer.	1,000 pounds limestone broadcast or 200 to 300 pounds in row with fertilizer. Neutral fertilizer.	Neutral fertilizer.....	Neutral or acid fertilizer...	Acid fertilizer.

¹ Information from the following publication: COOPER, H. P. FERTILIZER AND LIMING PRACTICES RECOMMENDED FOR SOUTH CAROLINA. S. C. Agr. Expt. Sta. Cir. 60, 23 pp. 1939.

² Soils with these pH values are not recommended for the crops mentioned.

³ For tobacco the pH value should not be much above 5.5.

Commercial fertilizers have been used in large quantities for many years. Until recently the fertilizer generally used on land devoted to cotton, and, in fact, on most of the cropland, was a 3-8-3 mixture; but in late years a 4-8-4 mixture has been used in applications ranging from 250 to 800 pounds an acre, and, in addition, from 75 to 150 pounds of nitrate of soda is applied as a top dressing to cotton, corn, and grain crops. Fertilizers of higher analyses are more economical to purchase than those of low analyses.

According to the county agricultural agent, about 800 pounds to the acre of a 3-8-6 fertilizer are used on the Norfolk soils for bright-leaf tobacco. In addition, many of the better growers side-dress with 50 to 100 pounds of sulfate of potash an acre as soon as the tobacco starts to grow. The quantity and kind of fertilizer used for cotton on Norfolk, Ruston, Orangeburg, and Greenville sandy loams and their phases does not vary materially among these types of soil. The standard application is about 400 to 500 pounds an acre of a 4-8-4 mixture, with 100 pounds of nitrate of soda as a top dressing. For row crops it is recommended that from 200 to 300 pounds of limestone an acre be applied in the drill each year, and this is the general practice. For broadcast applications, 1 ton an acre every 4 or 5 years is recommended.

Extension Service Bulletin 86 of the Clemson Agricultural College of South Carolina contains information on fertilizers for cotton.⁶ H. P. Cooper, Director of the South Carolina Agricultural Experiment Station, recommends the use of 400 to 1,000 pounds an acre of 4-8-4 or 4-7-5 fertilizer for cotton on Marlboro sandy loam and Greenville sandy loam, and from 100 to 150 pounds of nitrate of soda as a top dressing at about the time of the second chopping. Corn grown in rotation with cotton or following the turning under of a leguminous crop is not fertilized, but the land should receive from 100 to 200 pounds of nitrate of soda as a top dressing when the corn is from 10 to 15 inches high.

On Norfolk sandy loam, Norfolk fine sandy loam, Ruston sandy loam, and Orangeburg sandy loam, the recommendation for cotton is from 300 to 600 pounds to the acre of 4-8-4 or 4-7-5 and a side dressing of 100 to 150 pounds of nitrate of soda. If corn does not follow in rotation with cotton, from 200 to 300 pounds of similar fertilizer is applied, and the corn should always be given a side dressing of nitrate of soda in order to obtain best results.

There is a marked difference between the quantity of fertilizer recommended for cotton on the Marlboro and Greenville soils and the quantity recommended on the Norfolk, Ruston, and Orangeburg soils. This is because the Marlboro and Greenville soils have better moisture-holding capacity, have a higher organic content, and will respond to heavier applications of fertilizer under varying climatic conditions than do the Norfolk, Ruston, and Orangeburg soils and still produce good yields. It has proved advisable to apply nitrate of soda to corn at two different times—first when the plants are about 10 inches high and again when they are from 3 to 4 feet high.

"Sand drown" in tobacco, caused by a deficiency of available magnesium, is common on all soils with a pH value below 5.0, and avail-

⁶ HAMILTON, R. W. COTTON FERTILIZERS. Clemson Agr. Col. S. C. Ext. Bul. 86, 15 pp., illus. 1928.

able magnesium should be added to the soil. Where the pH value of the soil is 4.8 or below, a broadcast application of 1,000 to 1,500 pounds of dolomitic limestone to the acre is recommended. A pH value of 5.0 to 5.5 seems to be the most favorable condition for the successful growing of tobacco. If the pH value is around 6.0, some difficulty is likely to ensue with diseases or root rot. Acid fertilizer would be preferable for such a high pH value.

Peanuts do best on well-drained light sandy soils having a pH value of about 6.0. If the soil is more acid, an application of 300 to 600 pounds of land plaster an acre is beneficial, and, in addition, about 300 pounds of 2-8-4 or 0-12-6 fertilizer is recommended.

The following recommendations as regards the fertilizer analyses and rates of application for various crops grown in Sumter County are taken from Circular 60, Fertilizer and Liming Practices Recommended for South Carolina.⁷

Special consideration should be given to the soil and to fertilization for the tobacco crop. Experiments have shown that it is very desirable to leave the common leguminous crops, such as cowpeas and soybeans, out of the tobacco crop rotation systems. The tobacco crop following certain weeds has proved far superior to that in most other systems. The quality of the South Carolina bright-leaf tobacco could be greatly improved by the elimination of cowpeas and soybeans from the rotation and by having the tobacco follow horseweed, ragweed, or other desirable weeds. The fertilization recommended for the various conditions is as follows: 800 to 1,000 pounds an acre of 3-8-8 for light soils where average yields are expected or where tobacco is preceded by weeds and the soils have previously received large quantities of potash; 800 to 1,000 pounds an acre of 3-8-12 for light soils where average yields are expected and the highest grade or quality of tobacco is desired; and, where potash deficiency is expected, a side dressing of 100 to 200 pounds to the acre of sulfate of potash, within 20 days after transplanting the tobacco.

Fertilizers for corn are recommended as follows: 200 to 400 pounds an acre of 4-12-4 or 5-10-5 for soils where the crop is not preceded by a legume crop in a grain-and-hay rotation system; or 200 to 400 pounds an acre of 0-16-8 or 0-12-12 for soils where the crop is preceded by a legume in a grain-and-hay rotation.

The following fertilizers are recommended for oats, wheat, rye, and barley: 200 to 300 pounds an acre of 4-12-4 or 3-12-8 for soils where the grain crops are not preceded by legumes in a grain-and-hay rotation; or 200 to 300 pounds an acre of 0-16-8 or 0-12-12 after plowing under a heavy legume crop on soils not receiving a cotton or similar fertilizer, and, in addition, from 16 to 20 pounds an acre of nitrogen as a top dressing.

Where soybeans, cowpeas, and lespedeza are grown on soils with a favorable reaction, it is not a common practice to apply such nitrogenous fertilizer. These crops generally respond to an application of phosphoric acid and potash. The following practices are recommended: 200 to 300 pounds an acre of 4-12-4 or 4-16-4 for eroded areas where most of the surface soil has been lost and where the

⁷ See footnote 1, table 6.

young plants grow slowly; 200 to 300 pounds an acre of 0-16-8 or 0-12-12 for land in a grain-and-hay rotation, with good surface soil where young plants grow rapidly; or 200 to 400 pounds an acre of 0-18-0 for virgin or comparatively new land. In a rotation system receiving a cotton or similar fertilizer no additional fertilization is necessary for these crops.

Most of the soils used for pasture in the State need an application of lime to obtain a favorable soil reaction for the growth of desirable leguminous pasture plants. After a pasture is once well established, generally it is not necessary to apply any nitrogenous fertilizer unless an intensive grazing system is followed. Lime and phosphorus are the basic needs for most South Carolina pastures. Under certain conditions it is necessary to apply potash to obtain satisfactory production of legumes. The following fertilizers are recommended: 200 to 600 pounds an acre of 4-12-4 or 5-10-5 in establishing a pasture on eroded areas where most of the surface soil has been lost and where young plants grow slowly; 200 to 400 pounds an acre of 0-16-8 on old pasture sods, to stimulate the production of legumes and on soils known to be low in available potash; or 200 to 400 pounds an acre of 0-18-0 in combination with manure on old or new pasture sod.

For best results, land devoted to vegetables and fruits are fertilized as follows: Potatoes, 1,500 to 2,000 pounds an acre of 5-10-5 or 7-7-7; cabbage and asparagus, 2,000 pounds of 5-10-5 or 7-7-7; water-melons, cantaloups, and cucumbers, 600 to 1,000 pounds of 5-10-5 or 4-12-4; sweetpotatoes, 500 to 800 pounds of 3-8-8 or 3-8-12 on productive soils, and 1,000 pounds of 4-8-12 on less productive soils; snap beans, 600 pounds of 6-12-0 or 6-12-4 on soils that have previously been heavily fertilized, and 800 to 1,000 pounds of 4-12-4 on less productive soils; grapes, 600 to 1,000 pounds of 4-8-8 applied in the spring; and pecans, 1 to 3 pounds of 6-8-4 or 4-8-8 a tree for each year of age.

CROP ROTATIONS

No definite system of crop rotation is practiced by most of the farmers. Some of the better farmers recognize that rotation is an essential in good farming, and that the plan of rotation depends on the kind of soils, the acidity of the soils, and the crops to be grown. Owing to the danger of cotton wilt, rotation is highly advisable, even where wilt-resistant varieties are grown.

The necessary readjustment in the agriculture of the State will call for a careful study of crop-rotation systems used. Circular 60 of the South Carolina Agricultural Experiment Station⁸ recommends the following crop rotations for the State in general. These rotations are applicable to soils and conditions in Sumter County.

- (1) First year, cotton followed by small grain; second year, small grain with lespedeza.
- (2) First year, cotton followed by cover crop of crimson clover, vetch, Austrian Winter peas, rye, or a combination of two or more of these; second year, corn with cowpeas or soybeans.

⁸ See footnote 1, table 6.

- (3) First year, cotton followed by cover crop of crimson clover, vetch, Austrian Winter peas, rye, or a combination of two or more of these; second year, cotton followed by small grain; third year, small grain with lespedeza, or small grain followed by cowpeas or soybeans.
- (4) First year, cotton followed by cover crop of crimson clover, vetch, Austrian Winter peas, rye, or a combination of two or more of these; second year, cotton followed by small grain; third year, small grain with lespedeza; fourth year, corn with cowpeas or soybeans.
- (5) First year, cotton followed by small grain; second year, small grain with lespedeza; third year, corn with cowpeas or soybeans.
- (6) First year, cotton followed by cover crop; second year, corn followed by small grain; third year, small grain followed by lespedeza, cowpeas, or soybeans.
- (7) First year, corn with cowpeas or soybeans; second year, small grain with lespedeza; third year, lespedeza.
- (8) First year, corn with cowpeas or soybeans; second year, small grain followed by cowpeas or soybeans.
- (9) First year, corn with velvetbeans; second year, cotton.
- (10) First year, cotton or corn; second year, weeds; third year, tobacco.
- (11) First year, cotton or corn followed by small grain; second year, small grain followed by weeds; third year, tobacco.
- (12) First year, cotton or corn followed by small grain; second year, small grain followed by weeds; third year, weeds; fourth year, tobacco.

PLANT VARIETIES

The principal varieties of peaches grown are Mayflower, Burbank, Belle (Belle of Georgia), and Elberta; of plums, Abundance, Burbank, and Red June; of pecans, Stuart and Schley; of cotton, Farm Relief, Cleveland, Coker, Dixie, Triumph, and Humco; of corn, Reid Yellow Dent and Douthit; of oats, Texas Red Rustproof and Coker 33-50 Smooth Resistant; and of wheat, Redhart and Bluestem. The principal variety of asparagus is Martha Washington; the main variety of soybeans is Otootan; and the principal varieties of cowpeas are Whippoorwill and Iron.

LIVESTOCK AND DIVERSIFIED FARMING

Although Sumter County is apparently well suited to dairying, with soils and climate that allow year-round grazing and an abundance of possibilities for growing feed, dairying has not advanced far beyond the stage of supplying whole milk to the city of Sumter. The two creameries in the county get a large part of their milk and cream from outside, but no reason is evident why dairying could not be extended at a profit to the farmers. More beef cattle could be raised on many farms, as year-round grazing of various crops can be provided. Many of the farmers are raising hogs and selling them, as they find that they can raise hogs in the fields during practically the entire year on grazing crops and afterward fatten them on corn.

The common rotation for hog pasture is corn and soybeans, interplanted, followed by a mixture of grains—oats, rye, wheat, and barley—for winter and spring grazing. More livestock, more dairy products, and more hogs should be produced in Sumter County, as these fit into a diversified type of agriculture.

SOIL-BUILDING CROPS

The soil-building crops, in order of their acreage in this county, are cowpeas, velvetbeans, soybeans, crotalaria, and Austrian Winter peas. Perhaps one-half of the land in the county has at least one of

these crops growing on it at some time during the year. It is customary to plant one or more of these crops on practically all of the land following grain, and in practically all of the corn middles. All these crops, except crotalaria, are not planted entirely for soil improvement, as most of them are cut for hay, leaving only the roots and lower stems on the land, or they are grazed off. Crotalaria is a comparatively new crop in Sumter County, but the acreage is increasing. It will make more growth perhaps than any other legume on the land, and livestock will not eat it; therefore it is more strictly a soil builder than the other legumes. Planting and plowing under winter cover crops protect the soils from much leaching and erosion during the winter, and the organic matter thus added enables the soil to absorb and retain more moisture. The deep mellow sandy surface soils require only shallow plowing unless deeper plowing is necessary when turning under green-manure crops or other manures.

EROSION

Soil erosion by water is no great problem in Sumter County, except in a comparatively small part—the more rolling country. Terracing is practiced to some extent, and this, together with strip farming, seeding some of the steeper slopes to grass, or planting kudzu on such slopes, is highly recommended. Wind erosion in the spring is common in all parts of the county. The blowing sand, which may continue for a few hours or several days, destroys the young plants. Windbreaks are the best protection against this damage, and many permanent windbreaks are being planted. In the eastern part of the State, particularly in places in the truck-growing sections, temporary relief from wind erosion is afforded by planting rye in drilled strips about 50 feet wide across the fields. In some places permanent windbreaks of wild plum, privet, Osage-orange, and myrtle are being extended.

DRAINAGE

Considerable areas in the eastern and southeastern parts of the county, or the flatwoods section, present a serious drainage problem. In many places the surface of the land is so flat that the rain water runs off very slowly. Many areas have not been invaded by natural drainageways, and they maintain in large measure the constructional form of the land as laid down when this part of the county was in the sea. In many places in the central part of the county some of the potentially good agricultural land could be improved by drainage. Poorly drained land not only deprives the operator of productive acreage but generally interferes with systems of management. When the problem of drainage is one of controlling a high water table over an extensive area, it can be handled only by large-scale operations, and ordinarily this is beyond the resources of the individual farmer. Such artificial drainage has already been provided in some places by the construction of canals, supplemented by lateral ditches. In the last 2 years, cleaning out the main stream channels and cutting some canals have greatly improved the drainage of some areas.

MORPHOLOGY AND GENESIS OF SOILS

Sumter County is in the east-central part of South Carolina and mainly in the middle part of the Atlantic Coastal Plain of the State. It lies within the Red and Yellow Podzolic soils region of the United States. The elevation ranges from about 100 to 372 feet above sea level. In the higher part, or the sand-hill section, the relief ranges from rolling to hilly; extensive areas of undulating, almost level, or gently rolling land are in the central part; and flat to undulating areas, the latter in the flatwoods section, are in the eastern and south-eastern parts. Both surface and internal drainage for more than one-half of the county are good; but the flatwoods section, the first-bottom areas, and part of the terraces, or second bottoms, are poorly drained.

All the soils of the uplands originally supported a growth of long-leaf pine and shortleaf pine, together with some hardwoods, mainly oaks and a few hickories. On the first bottoms and the lower terraces, hardwoods, together with gum and some cypress, constituted the main growth. The soils, therefore, developed under a forest cover, which is not conducive to the accumulation of a large quantity of organic matter in the well-drained soils, as is common to the grass-covered areas in some parts of the United States. In most of the virgin areas a thin layer of leafmold, consisting of pine needles or leaves from deciduous trees, covers the surface, and a small quantity of organic matter has been incorporated in the topmost 1 or 2 inches of the A horizon.

A general characteristic of the well-drained soils is that they are light colored, and the A horizons range from light gray to red. Leaching of the soluble elements and alkaline earths is continuous throughout the greater part of the year, as the ground seldom freezes to more than a slight depth, and then for only a short period. The climate is oceanic; that is, it is characterized by short mild winters and long warm summers, with a mean annual rainfall of 45.26 inches. In the flatwoods, or poorly drained part of the county, are areas of soil that range from dark gray to black in the A horizons. This land was at one time in a swampy or semiswampy condition. Vegetation flourished and decayed, resulting in the dark color of these soils. All the soils of the county range from slightly acid to strongly acid throughout the profile. (See table 5 on p. 48.)

In practically all of the soils, considerable eluviation has taken place in the A horizons, and a large proportion of the original fine material in these layers has been carried down and deposited in the B horizon, or, in some places, some of the fine material in sloping areas has been removed by lateral seepage waters. This long-continued process has produced soils that have dominantly sandy A horizons and friable sandy clay B horizons. The B horizon of most soils ranges in thickness from 2 to 5 feet.

All the soils, with the exception of those in the first bottoms and terraces, have developed through the soil-forming processes from the weathered products of the underlying unconsolidated beds of sands, sandy clays, and clays. Another exception is the Greenville soils, which have developed from beds of heavy sandy clays influenced locally by impure limestone, marl, and, to less extent, fuller's earth. Probably the oldest geological formation exposed in this county is along Fullers Creek near the Santee River. This formation, as

observed in an exposure, consists of white or drab micaceous fine sand and contains molds of fossil shells and beds of fuller's earth.

The soils in the western part of the county, formerly known as the "High Hills of the Santee," although they parallel the Wateree River, are developed principally from the Lafayette formation. This formation is characterized by unconsolidated beds of sands, sandy clays, and gravel, ranging in color from red, orange, and yellow to white. Small deposits of rounded quartz gravel and some ferruginous sandstone are present locally in this formation. This formation gives rise mainly to the Orangeburg soils and to some of the Ruston soils. East of the Lafayette formation, and underlying a large part of the county, is the Columbia formation of sands, sandy clays, and clays. These materials are coarser on the higher elevations and gradually become finer to the east and southeast as the elevation decreases. From this formation have developed the Norfolk, Marlboro, Dunbar, Coxville, and Portsmouth soils.

The areas of sand in the northwestern and particularly in the southwestern parts of the county represent deep deposits of sand over the unconsolidated beds of variegated sandy clays. The old alluvium forming the terraces along the Wateree River is composed of materials washed from the soils of the Piedmont Plateau, brought down by the river, and deposited when this stream flowed at much higher levels. In the first bottoms along the Wateree and Santee Rivers are extensive areas of recent alluvial materials, which also have been brought down from the Piedmont Plateau. The old alluvium on second bottoms and terraces along the Lynches River was brought down from the soils of the Coastal Plain.

The sandy loams and fine sandy loams of the Orangeburg, Ruston, Norfolk, Marlboro, and Greenville series may be considered the soils of the uplands, with a normal soil profile development. The important factors in soil development are climate, vegetation, parent material, age, and relief. In this county, vegetation, climate, and age are practically the same, and over much of the area the parent materials are similar, but the relief is different. It would seem that the most fundamental factor, as regards the differences in profile development in this county, may be the relief. This has influenced or allowed differences in drainage, aeration, and oxidation.

In this group of normally developed soils the A horizons are light textured; that is, they are dominantly sandy. The B horizons are heavier textured than the A horizons; are uniform in color, texture, and consistence; and consist dominantly of friable sandy clays. The materials in the C horizons vary widely in texture, color, and consistence, being generally lighter textured than in the B horizons and showing mottlings, streakings, and splotchings. In some places rounded quartz gravel is present, and a rather definite stratification is apparent in the C horizon.

In addition to the soils that have normal development of a soil profile, the county contains extensive areas of sands, Hoffman soils, steep phases of the Orangeburg soils, and poorly drained soils that have not developed a normal profile. Sheet erosion has been active on the Hoffman soils and on the steep areas of the Orangeburg soils and in places has removed the sandy covering and exposed the sandy clay. Some gullies have formed in these localities, and these have destroyed in large measure the original profiles.

In the flatwoods section poor surface and internal drainage have impeded the development of a normal soil profile, as the soil-forming processes have not had an opportunity to act normally on the wet or semiwet material. The water table was high, or near the surface, and this condition allowed but little aeration and oxidation. Inter-mittent wetting and drying in these soils has caused the mottled and streaked coloration. This is particularly true in the B horizons of the Coxville and Dunbar soils, as bright-red mottles are conspicuous in the mottled light-gray and yellow material. The Portsmouth soils are the most poorly drained upland soils in the county, and they have a large content of organic matter. The water table in some places in Sumter County has been lowered from 3 to 11 feet in recent years by the construction of drainage canals, supplemented by lateral ditches.

Some evidence of the effect of good drainage is shown in these imperfectly or poorly drained soils, as in some places the B horizons, formerly mottled and streaked, are beginning to assume a uniform color.

Following is a description of a normally developed profile of Orangeburg fine sandy loam, as observed one-fourth mile south of Hillcrest School:

- A₁. 0 to 4 inches, gray or brownish-gray sandy loam, containing a small quantity of organic matter from grasses and roots. On the surface are oak leaves and pine needles.
- A₂. 4 to 18 inches, loose, mellow, friable brownish-yellow fine sandy loam.
- B. 18 to 50 inches, red fine sandy clay. When dug from the bank, this material breaks into irregular lumps that are easily crushed between the fingers to a fine crumbly mass.
- C. 50 to 80 inches +, material ranging from a light-red fine sandy loam to loamy fine sand.

The Greenville soils differ essentially from the Orangeburg soils, in that the A horizon is red or reddish brown and the B horizon is darker red and is heavier in texture, whereas the underlying C horizon is a marbled or mottled heavy sandy clay. Blakely loamy sand differs from Ruston loamy sand, in that it is much darker in color throughout and contains more organic matter and some manganese dioxide.

A description of a profile of typical Norfolk sandy loam, as observed 10 miles northwest of Sumter, is as follows:

- A₁. 0 to 2 inches, dark-gray sandy loam containing a small quantity of organic matter. A thin layer of pine needles and oak leaves covers the surface, and roots of grasses and broomsedge are present in the soil.
- A₂. 2 to 5 inches, light-gray or yellowish-gray sandy loam or loamy sand, practically free of organic matter.
- A₃. 5 to 16 inches, grayish-yellow mellow and friable sandy loam or heavy loamy sand.
- B₁. 16 to 30 inches, yellow friable sandy clay. When dug from a bank this material breaks into irregular lumps that can be easily crushed between the fingers to a friable crumbly mass.
- B₂. 30 to 40 inches, yellow, with faint mottlings of gray and rust brown, light sandy clay or heavy sandy clay, fairly friable and crumbly.
- C. 40 inches +, yellow sandy clay, spotted with brown or red and some gray. It is slightly compact and laminated but brittle.

The Ruston soils are intermediate in color, particularly in the B horizons, between the Norfolk soils and the Orangeburg soils. They have gray surface soils and yellowish-brown friable crumbly sandy clay subsoils.

Marlboro sandy loam differs essentially from Norfolk sandy loam, in that it contains more fine material throughout the profile, the A horizon is slightly dark in color, and the B horizon is a deeper yellow or faintly reddish yellow and is slightly heavier textured. The material in the C horizon also is heavy over typically developed areas.

The Dunbar soils in their soil characteristics and soil development are intermediate between the Norfolk soils and the Coxville soils. They are heavier and more mottled in the B horizons than the Norfolk soils but not so heavy as the Coxville soils.

The Coxville soils are developed from heavier parent materials than the Portsmouth soils. They are lighter in color and much heavier in texture in the B horizons, and the mottlings are much more pronounced than in the Portsmouth soils.

The Portsmouth soils contain a larger quantity of organic matter than any other soil in the county. They occur in the slight depressions and on the flat areas, which evidently were in a swampy or semiswampy condition for a long time.

The Hoffman soils represent a soil condition rather than a definite soil type, and in many places they appear to be no more than AC soils; that is, they have a covering of loose sand over beds of variegated clays and sandy clays.

St. Lucie sand represents small areas of old lakes or coastal beaches.

On the second bottoms and terraces of the Wateree River, the old alluvial material that was brought down from the Piedmont Plateau has given rise to the Wickham, Altavista, and Roanoke soils. The wide differences in these soils are, in large measure, due to differences in drainage. The Wickham soils are well drained and have fairly normally well developed profiles, whereas the Altavista soils have imperfectly developed profiles, and the Roanoke soils, which are poorly drained, do not have a normal profile development. The Wickham and Altavista soils partake of the characteristics of some of the well-developed soils in the Piedmont Plateau.

On terraces and second bottoms along the Lynches River, the Kalmia and Cahaba soils have developed normal soil profiles. They have characteristics somewhat similar to the Norfolk and Ruston soils, respectively, of the uplands. The Myatt soils are poorly drained and do not have a normally developed soil profile.

In the first bottoms along the Wateree and Santee Rivers, the alluvial soils—Congaree silty clay loam and Congaree-Wehadkee silty clay loams—are subject to frequent and heavy inundations. At times of overflow, new materials from the soils in the Piedmont Plateau are deposited in many places. These alluvial materials are so young and, in many places, so poorly drained that no development of a profile has taken place.

Swamp represents wet areas of alluvial materials in the first bottoms that are so variable in texture and color that no type could be assigned to this material.

Table 7 gives the chemical composition of colloids from typical profiles of important soil types mapped in this county. These samples were collected from typical areas of similar soils in North Carolina and are representative of the same types of soil in Sumter County. Table 8 gives the mechanical analyses of some of these soils.

TABLE 7.—Chemical analyses of colloids from several soil profiles in North Carolina ¹

Soil type and location	Depth	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	MnO	CaO	MgO	K ₂ O	Na ₂ O	P ₂ O ₅	SO ₂	Ignition loss	Organic matter	Molecular ratio		pH
															SiO ₂	SiO ₂	
															Al ₂ O ₃	R ₂ O ₃	
Norfolk fine sandy loam, Wayne County, N. C.-----	<i>Inches</i> 0-12	<i>Percent</i> 35.97	<i>Percent</i> 32.14	<i>Percent</i> 10.70	<i>Percent</i> 1.23	<i>Percent</i> 0.01	<i>Percent</i> 0.35	<i>Percent</i> 0.58	<i>Percent</i> 0.52	<i>Percent</i> 0.18	<i>Percent</i> 0.10	<i>Percent</i> 0.12	<i>Percent</i> 17.83	<i>Percent</i> 4.65	1.80	1.57	5.1
	14-34	37.54	34.41	12.41	1.10	.01	.50	.52	.53	.27	.10	.11	14.03	1.06	1.86	1.51	4.6
	36-80	38.73	34.10	11.97	.90	.01	.28	.42	.30	.20	.07	.09	14.29	.77	1.83	1.57	4.6
Dunbar fine sandy loam, Lenoir County, N. C.-----	0-5	41.47	26.91	4.75	1.90	.02	.15	.36	.26	.31	.10	.20	23.41	13.23	2.61	2.35	4.9
	5-12	43.48	33.20	6.69	1.60	.02	.07	.58	.28	.22	.05	.08	14.61	2.36	2.23	1.97	4.5
	16-28	43.70	32.62	8.21	1.22	.02	.07	.58	.33	.01	.05	.07	13.09	.88	2.27	1.96	4.4
Portsmouth fine sandy loam, Lenoir County, N. C.-----	28-48	40.81	29.94	12.92	1.35	.02	.09	.64	.36	.15	.07	.08	13.20	.99	2.24	1.81	4.4
	0-15	33.50	22.23	2.09	1.92	.02	.41	.15	.19	.19	.08	.21	39.38	30.98	2.56	2.41	4.1
	16-35	45.27	33.78	2.30	3.63	.01	.12	.16	.30	.18	.06	.13	14.06	2.35	2.28	2.19	4.3
	40-70	46.54	32.00	3.71	2.57	.01	.19	.28	.46	.31	.09	.16	14.24	2.34	2.47	2.30	4.4

¹ Information taken from the following publication: HOLMES, R. S., HEARN, W. E., and BYERS, H. G. THE CHEMICAL COMPOSITION OF SOILS AND COLLOIDS OF THE NORFOLK AND RELATED SERIES. U. S. Dept. Agr. Tech. Bul. 594, 34 pp., illus. 1938.

TABLE 8.—Mechanical analyses of three soils from Wayne County, N. C. ¹

Soil type	Depth	Fine gravel (2-1 mm.)	Coarse sand (1-0.5 mm.)	Medium sand (0.5-0.25 mm.)	Fine sand (0.25-0.1 mm.)	Very fine sand (0.1-0.05 mm.)	Silt (0.05-0.025 mm.)	Clay (0.005-0 mm.)	Colloid (0.002-0 mm.)	Organic matter by H ₂ O ₂
		<i>Inches</i> <i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Norfolk fine sandy loam.-----	0-12	1.7	6.6	9.9	25.9	17.8	28.4	8.9	4.9	0.07
	14-34	1.0	5.1	7.7	20.4	14.0	22.7	28.8	23.5	.02
	36-80	1.2	4.8	7.9	19.7	13.7	21.3	31.3	30.1	.0
Orangeburg fine sandy loam.-----	0-6	1.6	9.8	10.6	26.1	26.3	20.0	5.0	3.0	.4
	16-30	.6	4.0	4.1	9.7	17.4	17.0	47.1	46.5	.0
	80-100	3.6	12.4	14.3	27.1	6.6	8.3	27.7	27.7	.0
Ruston fine sandy loam.-----	0-10	.5	2.7	4.4	21.1	31.1	31.5	7.9	6.7	.7
	16-30	.9	2.6	3.7	16.5	19.7	26.3	29.4	28.3	.1
	40-54	.6	3.6	9.7	22.9	14.9	17.2	30.8	29.6	.1

¹ Information taken from the following publication: HOLMES, R. S., HEARN, W. E., and BYERS, H. G. THE CHEMICAL COMPOSITION OF SOILS AND COLLOIDS OF THE NORFOLK AND RELATED SERIES. U. S. Dept. Agr. Tech. Bul. 594, 34 pp., illus. 1938.

SUMMARY

Sumter County lies in the east-central part of South Carolina, most of it being in the middle part of the Atlantic Coastal Plain of the State. It includes 681 square miles, or 435,840 acres.

It is well provided with railroad transportation and has an excellent system of paved highways, supplemented by well-graded gravel or sand-clay roads.

The relief ranges from flat or undulating to gently rolling or rolling, and the drainage from poor to good or excessive.

The climate is mild, the summers being long and warm and the winters comparatively short and mild. The fact that the center of the county is less than 100 miles from the Atlantic Ocean probably accounts for the lack of extreme temperatures in winter and summer. The average length of the frost-free season is 244 days. The rainfall is ample and well distributed throughout the year, the drier months being in the fall during the harvest. Both climate and soils are favorable for the production of a wide range of staple crops, fruits, pecans, truck crops, and garden vegetables.

The agriculture at present centers around the production of cotton as the important cash crop, and some tobacco is grown. Corn, perhaps, is grown more widely than any other crop and is used mainly for feeding work animals, fattening hogs, and making meal for home consumption. Some wheat and oats and a large quantity of hay, produced mainly from cowpeas, soybeans, and velvetbeans, are grown. Peanuts, sweetpotatoes, pecans, peaches, dewberries, truck crops, and garden vegetables are successfully produced.

The principal agricultural soils are dominantly light-colored and sandy in the surface soils and have friable sandy clay subsoils. Most of these soils lie favorably for agricultural purposes and lend themselves admirably to the use of farming machinery. They are easy to till, warm early in the spring, respond readily to fertilization and to the incorporation of organic matter, and require only light farming implements. The subsoils are retentive of moisture and are easily penetrated by plant roots. The soils contain only a small quantity of organic matter, except where it has been supplied by man. They are acid to strongly acid throughout the surface soil and the subsoil.

Extensive flat and almost level or undulating areas are in the eastern and southeastern parts of the county and in the first bottoms of the Wateree and Santee Rivers. The main areas of sands are developed in the southwestern and northwestern parts. The intervening areas, or the middle part, have the most favorable relief and good drainage.

The soil types and phases recognized and delineated on the soil map have been classed in seven groups, based on the characteristics of the surface soils and subsoils, drainage conditions, and agricultural use.

(1) Soils with gray surface soils and yellow or yellowish-brown sandy clay subsoils include the fine sandy loams and sandy loams, together with their deep phases, of the Norfolk, Marlboro, Ruston, Kalmia, and Cahaba series. The soils of this group are well suited to the production of all the crops commonly grown, and the Norfolk and Marlboro soils are especially well adapted to the production of bright-leaf tobacco.

(2) Soils with gray or reddish-brown surface soils and red sandy clay subsoils are members of the Orangeburg and Greenville series. The Orangeburg soils have gray or brownish-gray surface soils and red sandy clay subsoils, whereas the Greenville soils, or the so-called red lands of the county, have dark-brown surface soils and dark-red heavy sandy clay or clay subsoils. They are strong productive soils and are suited to the production of the staple crops of the county and, in addition, to pecans and peaches.

(3) Gray, brown, or dark-red loamy sand or sands belong to the Norfolk, Ruston, Red Bay, and Blakely series. These are the lightest textured soils in the county, and only a small proportion of them is under cultivation. Red Bay loamy sand and Blakely loamy sand are the most productive soils in this group.

(4) Soils with gray surface soils and mottled sandy clay and clay subsoils include the Coxville and Dunbar soils, which occur mainly in the eastern and southeastern parts of the county. The Coxville soils are poorly drained, whereas the Dunbar soils are fairly well to imperfectly drained. These are potentially good agricultural soils but require artificial drainage to reclaim them for agriculture.

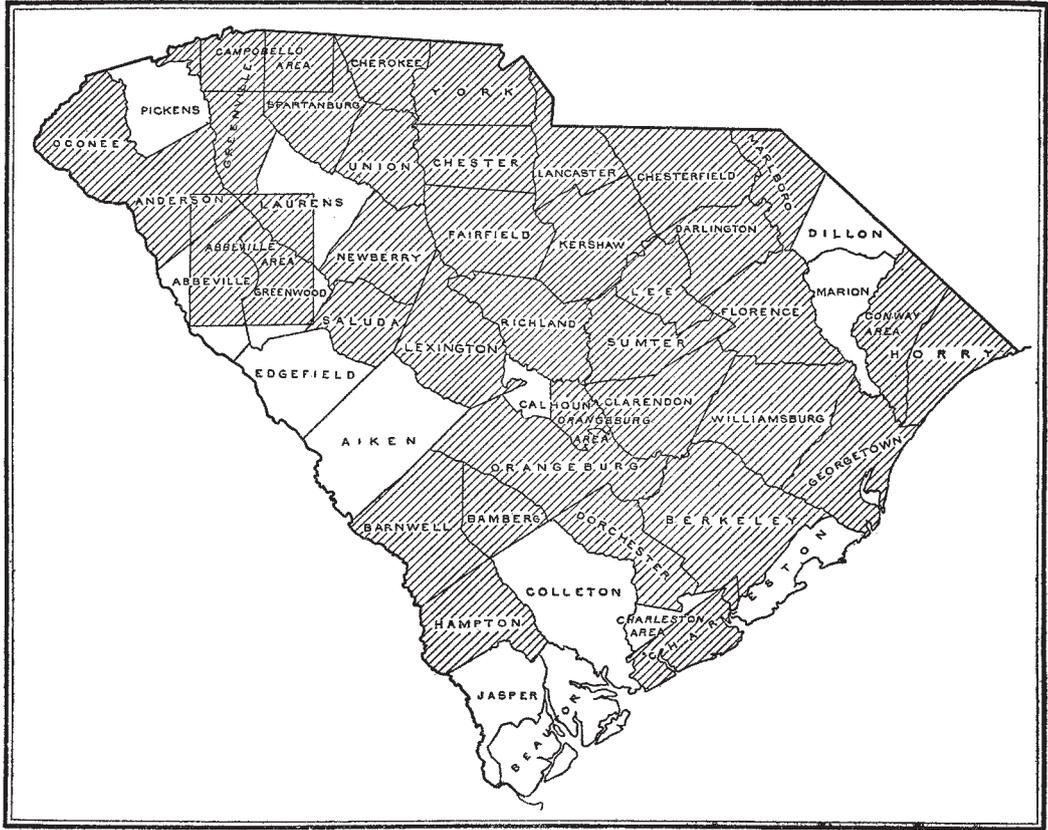
(5) Soils with black surface soils and mottled sandy clay or sand subsoils are members of the Portsmouth and Scranton series. In the aggregate, the Portsmouth soils cover a considerable acreage, but the Scranton soils occupy only a small acreage. These are black soils, and they contain a large quantity of organic matter. They are naturally poorly drained, but when drained and reclaimed, Portsmouth fine sandy loam and Portsmouth loam are good agricultural soils.

(6) Soils with gray or brown surface soils, and yellow or reddish-brown clay subsoils, on terraces, include the Wickham and Altavista soils, which occur in the northwestern part of the county. The State Farm is located in part on these soils. They are good agricultural soils and can be built up to a fairly high state of productivity.

(7) Miscellaneous soils and land types play a very insignificant part in the present agriculture. Congaree silty clay loam, Congaree-Wehadkee silty clay loams, and the Roanoke soils are inherently good soils, but heavy overflows and poor drainage preclude them from production. Swamp has no use other than for forest.

Sumter County ranks as one of the most progressive counties in the State, owing to its large areas of potentially good agricultural lands, which are suited to the production not only of the staple crops but to a wide variety of special crops. Many of the soils are capable of being built up to a high state of productivity, and this condition is easily maintained by proper rotations, including the turning under of leguminous crops or the addition of barnyard manure. The soils are well suited to the production of soybeans, cowpeas, velvetbeans, and Austrian Winter peas, and these not only are soil-improvement crops but also supply a large quantity of hay.

Land in this county is comparatively cheap and offers excellent opportunities for future development.



Areas surveyed in South Carolina, shown by shading

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