

# SOIL SURVEY OF SUMTER COUNTY, GEORGIA.

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## DESCRIPTION OF THE AREA.

Sumter County is situated in the southwestern part of Georgia. The parallel  $32^{\circ}$  north latitude passes through it not far from the center and meridian  $84^{\circ}$  west longitude near the eastern border. The county is bounded on the north by Schley and Macon Counties, on the east by Macon, Dooley, and Crisp Counties, on the south by Lee and Terrell Counties, and on the west by Webster and Marion Counties. Americus, the county seat, is about 150 miles south of Atlanta, 185 miles west of Savannah, and 95 miles north of the Florida State line. The county contains 322,560 acres, or 504 square miles. It is divided into six land districts, which correspond to townships in some other States, and these into lots containing approximately 202 acres each. The base map, showing the roads, streams, railroads, dwellings, churches, and schoolhouses, was made in the field as the work of the soil survey progressed. The map is on a scale of 1 inch to 1 mile.

The topography of the country varies from quite rolling in the northern part to almost flat in the southern part. The general slope

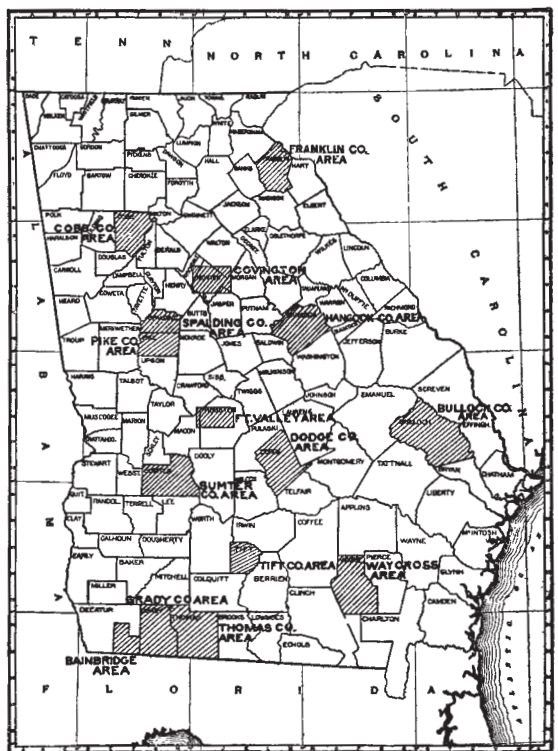


FIG. 13.—Sketch map showing location of the Sumter County area, Georgia.

is from northwest to southeast and practically all the streams flow in a southeasterly direction. The Flint River forms the eastern boundary line and receives the drainage of many streams flowing from the county, the largest of which are Sweetwater and Muckalee Creeks and Kinchafoonee River, the last forming a part of the southwest boundary. These streams have numerous tributaries which have their sources in perennial flowing springs. The most noted of these are Magnolia Springs, Myrtle Springs, and Sweetwater Mineral Spring. In several places in the county dams are placed across the larger streams for the purpose of securing power for milling. Many beautiful lakes are formed in this way. In the southeastern and eastern parts are numerous shallow lime sinks of very irregular shape, some of which have natural drainage while others have not. In these are found the Portsmouth soils, either the sand, the sandy loam, or the clay, depending upon the character of the surrounding soils and whether or not the sinks have natural outlets.

The county in general has the appearance of being heavily wooded. The stream courses are all wooded as are also all the low, wet areas and the stony areas.

The stream valleys, which are of so much importance in some areas, are of small importance here for agriculture on account of the swamplike nature of the first bottoms. The flood plains along practically all the streams in this county include all of what are usually first-bottom lands, and except in times of very dry weather these areas are covered with water. Along some of the streams some valuable cypress timber is yet standing. In most cases, however, the timber has been sold to lumbermen and is being, or has been, removed. Such areas are largely used for pasturing hogs.

For various reasons soil erosion in this county has not been severe. The sand belts bordering the streams take up much of the rainfall, which later finds its way to the streams as springs. The pebbly or sandy character of much of the upland country does not favor erosion. The streams therefore contain clear water most of the time. There are no high bluffs along the streams, although there are some deep gullies in the northern part of the county. The surface usually slopes back gradually from the streams to the higher land.

The lumber and turpentine business has been of considerable importance here, but most of the finest pine timber has been cut. Small sawmills and a few turpentine stills are operated in the county. Some of the smaller sawmills are working on land that has once been cut over. A few blocks of original longleaf pine are still standing, the largest and most valuable one being just east of Cobb. This block of timber is said to be one of the finest in the State. The principal forest growths of the higher lands include pine, oak, hickory, chestnut, walnut, locust, linden, beech, ironwood, dogwood, tulip,

cedar, elm, poplar, wild cherry, holly, sassafras, china berry, mulberry, hackberry, hard maple, and mayhaw. In the lower lands and along the streams are found magnolia, soft maple, willow, cypress, sweet gum, black gum, water beech, bamboo, and gallberry.

Sumter County was laid out in 1831 from part of Lee County and was named in honor of Gen. Thomas Sumter. Since the county was organized the boundary line has been changed in many places. The first inhabitants of Sumter County came principally from the older counties of the State. The land at this time was owned in very large tracts by a few men. Since that time many of these large holdings have been divided into smaller farms and sold to newcomers. A few of the large plantations, five or six thousand acres in extent, still remain intact, and on some of them the typical antebellum conditions yet obtain. The large mansion occupied by the owner, the commissary, the private cotton gin, the negro quarters surrounding the mansion like a small village, the immense cotton fields, the overseer who rides about on horseback, are all here much as they were before the war.

Two railroads furnish fairly good transportation facilities to all the county except the northeast and southwest sections. The main line of the Central of Georgia traverses the county from north to south through Americus and the Columbus branch of the Central comes into the county from the north and runs as far as Americus. The Seaboard Air Line Railway enters the county from the west, running due east to Americus, thence southeast and crosses the Flint River near the southeast corner. Americus, with a population of nearly 10,000, is the largest town and the principal business center. Other incorporated towns and shipping centers of considerable importance are Plains, Leslie, Andersonville, and Desoto. Huguenin, Cobb, Huntington, New Point, Maddox, Sumter, and Bagley are flag stations which furnish shipping facilities to the surrounding farms. Aside from these, the railroad companies have built spurs in many places for the accommodation of individual farmers. Friendship, Yaw, Bodsford, Providence, and Crookston are outlying villages without adequate shipping facilities at present.

Excellent graded sand-clay roads are now being built in all parts of the county by convict labor. These are of immense value to the farmer, for the size of the load which he is able to haul over these roads with one good team is limited only by the strength of his wagon. Formerly the roads in many parts were very sandy and only small loads could be hauled.

In this county, 1 mile from the city of Americus, is located the Third Congressional District Agricultural School. There is a large academic building and two dormitories, one for girls and one for boys. There are about 100 students enrolled, the larger number being boys.

At this school the boys are taught the possibilities and opportunities of farming in the South, and the good effects are already noticeable, although the school has been in operation only three years. The school is what might be called a model farm and home. All the students are required to stay at the dormitory, there being no day students, and they are also required to do a certain amount of work, which, for the boys, consists of daily work with their own hands on the farm and in the shop.

#### CLIMATE.

The climatic conditions of Sumter County are especially favorable to agriculture. The summers are long, but not extremely hot. The winters are short; snow seldom falls, and ice more than one-fourth inch thick is never formed. Destructive winds, so common in some parts of the South, very seldom occur in this immediate section.

The annual rainfall is abundant, but not excessive, and is very well distributed throughout the year. Protracted dry weather sometimes occurs during the winter months, but very seldom in the summer, so that crops are rarely injured by such conditions to any great extent.

The date of killing frost is usually so late in the fall or so early in the spring that most crops escape injury. The frost table below shows that in the last 20 years a killing frost has not occurred later than April 1, with the single exception of the present year, 1910, when a killing frost occurred on the night of April 25. This was the latest killing frost that has ever been known here. The first frost in the fall for the last 20 years has not occurred earlier than October 24. It usually comes in November and sometimes as late as the first week in December.

The winters are so mild that such crops as onions, cabbage, collards, turnips, and beets may be kept growing throughout the year. By using a light cloth cover, lettuce, English peas, and other garden crops may be kept green all winter.

Hailstorms occasionally occur, but the damage to crops from such a source in the last 20 years has been very slight.

Taking the year as a whole, there is perhaps no more pleasant climate anywhere in the country. Though the summers are long and warm and the humidity is sometimes quite high, the nights are cool and pleasant, there being usually a good breeze.

The following tables are compiled from the records of the Weather Bureau station at Americus. The figures for mean temperature and precipitation are computed from data covering 25 and 26 years, respectively.



*Normal monthly and annual temperature and precipitation at Americus.*

Month.	Temperature.	Precipitation.	Month.	Temperature.	Precipitation.
	° F.	Inches.		° F.	Inches.
January.....	47.9	4.23	August.....	81.1	5.33
February.....	50.2	5.08	September.....	76.6	3.31
March.....	59.2	5.50	October.....	66.1	2.25
April.....	65.5	3.49	November.....	56.6	2.72
May.....	74.8	3.29	December.....	49.8	3.81
June.....	80.7	4.42			
July.....	82.5	5.21	Year.....	65.9	48.64

*Dates of first and last killing frosts at Americus.*

Year.	Last in spring.	First in fall.	Year.	Last in spring.	First in fall.
1891.....		Oct. 29	1893.....	Feb. 22	Nov. 29
1892.....	Mar. 20	Oct. 28	1904.....	Feb. 13	Nov. 15
1893.....		Oct. 31	1905.....	Feb. 17	Dec. 4
1896.....		Nov. 9	1906.....	Mar. 21	Nov. 13
1897.....	Feb. 28	Dec. 6	1907.....	Feb. 17	Nov. 14
1898.....	Mar. 5	Oct. 24	1908.....	Feb. 29	Nov. 15
1899.....	Mar. 29	Nov. 4	1909.....	Mar. 1	Nov. 19
1900.....	Apr. 1	Nov. 9	1910.....	Apr. 26	
1901.....	Mar. 22	Nov. 16	Average.....	Mar. 11	Nov. 13
1902.....	Mar. 19	Nov. 28			

## AGRICULTURE.

In Sumter County may be seen all stages of agricultural practice from very primitive to the most modern. Farm implements from rude home-made affairs to the most highly improved are seen in operation. Much of the land is broken by small, rudely constructed plows, which hardly more than scratch the surface, while some land is plowed by large gang plows drawn by traction engines. In many cases the breaking and preparation of the land, the covering of the seed, and the cultivation of the crops are all done with the same small, crude plow drawn by one mule. This is practiced largely by those negroes who farm without white supervision. Some of the negroes, however, are fairly good farmers. Most of the good farming of this county is carried on by white men who have made a study of agriculture and its possibilities here in the South and who believe that it may be developed here as extensively and profitably as in any other part of the country. They have adopted modern methods and are using improved machinery to the fullest extent the present condition of their land will permit. It might be stated here that much of the cleared land in this county is still dotted over with stumps.

The recently improved farm homes, where modern household conveniences have been installed, the remodeling of farm buildings and the building of new ones, the superintending of much of the farm work by the owner, all of which may be seen on several farms in this county, are some of the things that plainly indicate the keen interest the people are taking in agricultural development. Many persons who have always been engaged in some mercantile business have recently purchased land and are becoming actively interested in farming. The high price of farm products for the last few years has doubtless had something to do with this, but there is good reason to believe that much of the farm improvement in this county will be of a permanent nature.

Until only a few years ago cotton, corn, and a small acreage of sugar cane were almost the only crops grown in the county. The one-crop system of farming on the same land year after year resulted in the gradual diminution of the yields. About 60 years ago the decline in yields was partially checked by the use of Peruvian guano, and afterwards by mineral fertilizers, both of which soon came into general use. As recently as 25 or 30 years ago many farmers did not use commercial fertilizers at all, but depended entirely upon compost, made from what stable manure they could get and pine needles and other trash gathered from the forests.

It is stated by some that as good or better yields were obtained then by that method as with commercial fertilizers at the present time. Since then the farmers of this county have depended too largely on mineral fertilizers. The fertilizer idea has become so thoroughly rooted in the minds of farmers generally that many believe the only thing necessary for success in farming is to know just what grade or kind of fertilizer their land needs, and that if they could have a sample of their soil analyzed chemically their success would be assured. This idea is held by a large number of Sumter County farmers, including some of the most intelligent and progressive. The use of the proper commercial fertilizer each year, without the return of any organic matter, does not constitute good farming. Such a practice would soon put the soil in such a condition that profitable crops of any kind could not be grown upon it, and many good farmers in this county believe that the unproductive, impoverished condition of much of the land here is due largely to the growing of crops with heavy applications of commercial fertilizers without the addition of anything to the soil in the way of vegetable matter.

Good farming includes, among other things, the deep and thorough preparation of the soil; the incorporation of large amounts of compost or vegetable matter in some form, so that the soil may be kept in a good mechanical condition; the maintenance of a systematic crop

rotation, including at least one leguminous crop, such as cowpeas, velvet beans, vetch, or some variety of clover; and in the South good farming may also include the judicious and very conservative use of commercial fertilizers. Not enough stable manure is produced here to fertilize all the crops: hence the use of the commercial material will be necessary for some time to come. Many farmers here have learned that an application of compost to the land will greatly reduce the commercial fertilizer requirement. One farmer who used stable manure with 75 pounds of commercial fertilizer per acre, produced as much cotton as on land to which 600 to 800 pounds per acre of the commercial article had been added alone. Many other farmers have had about the same experience. The great value of compost is being gradually learned in this area and it is no uncommon thing to see it being strewn along in the rows by hand from a sack the same as commercial fertilizers. Such practice should be greatly extended, as vegetable matter in some form is the one thing most needed by the soils of Sumter County.

Domestic animals, except those necessary for farm work, are not generally raised. Most farmers have a few hogs, but usually of inferior breed. There are many farmers here who, much of the time, are without stores of home-produced meat or milk or butter. A few goats are occasionally kept, but there are no sheep in the area. Several farmers have gone quite extensively into hog raising, an industry which has been found profitable. The Berkshire and Duroc-Jersey breeds have been found best suited to local conditions. Some farmers sell their hogs on foot, while others butcher them and cure the meat before disposing of it. On account of the mild climate in this latitude much difficulty in curing the meat is experienced, and for this reason it is thought safer to dispose of hogs on foot. Hog raising in connection with the growing of peanuts has given profitable results.

There are many good horses in the county, probably as many as at any previous time. Owing to the improved agricultural methods which are being adopted, the tendency is to bring in better and heavier horses and mules. Practically all the farm work is done with mules, but there seems to be a constant demand for good horses for driving.

The usual objection made to the more extensive raising of live stock is the lack of pasture. This is easily remedied. Any land in this county, if left undisturbed for a few years, will become heavily covered with Bermuda grass, a plant which furnishes excellent pasturage. Many other grasses do well here and some of them grow all winter. In too many cases the cattle and hogs are left to shift for themselves during the winter months, and many of them die or become badly run down on account of the scarcity of food. Forage crops, which will furnish ample pasturage throughout the year, will

be treated in another paragraph. Razor-back hogs and scrub cattle should not be kept on any farm. Better animals should be secured and more attention given to the improvement of breeds.

Another industry which would be very profitable in this county is poultry raising. There is a constant demand for chickens and eggs at a good price. Broilers bring from 45 to 50 cents each, and the hotels in all the towns in this section of the State offer fancy prices for all poultry products, the demand for which is never fully supplied. The poultry business on a farm, if properly carried on, requires considerable attention, it is true, but the expense of maintaining the business on a profitable basis is comparatively light.

Cotton is the money crop of Sumter County. It is grown by every farmer, and many grow almost nothing else, except a small amount of corn, sugar cane, and sweet potatoes. Cotton and corn have always been the principal crops, and it is hard for farmers to adopt new crops and methods. Any farmer can get from the banks what money he needs for growing a crop of cotton, and the crop is taken as collateral, but no other crop is accepted as security for the loan of money.

The greater part of the cotton crop is grown by the old one-horse method and therefore in some particulars the culture is not as thorough as it should be. The amount of fertilizer used varies from 200 to 800 pounds to the acre, very few, however, applying the larger quantity. Some negro farmers use even less than 200 pounds to the acre, and, as heretofore stated, some of the better growers have reduced the amount of the commercial fertilizer necessary by the substitution of compost. The seed is planted with a one-horse implement.

It is difficult to say just which type of soil is best suited to cotton. The sands or the deep sandy loams are, of course, not suited to such a long-season crop as cotton. Between the sandy loams and the clay loams it can not be said that there is much difference in their adaptability to this crop. If there be any difference it is probably in favor of the heavier pebbly lands, which are known in this report as Tifton sandy loam, Greenville gravelly sandy loam, and Greenville gravelly clay loam.

The yield of cotton ranges from one-third bale to 1 bale or more per acre. There is some effort to secure better seed, especially to produce strains more resistant to disease and yielding more and better lint. The planting of seed taken from the public gins is a practice which disseminates cotton disease and lowers both the yield and the quality of the product. The selection of the best plants in the field and the use of a hand gin for extracting the seed is a commendable practice.

The most serious cotton disease in Sumter County, and about the only one of any consequence, is root rot, locally known as black root. When land becomes infected with this disease it is best to grow other



crops that are not affected, such as oats, corn, rye, and some varieties of cowpeas. It is now possible to secure cottons which are more or less immune to the disease. A systematic crop rotation which will bring in cotton only once in three or four years on any given field, and which will include at least one crop of legumes, will, if continually practiced, obviate all danger of injury from the ravages of root rot.

Corn is also a crop that is grown by every farmer in the area. It is one of the necessary crops, and large quantities of it are consumed on the farms. It is grown on all grades of land, from the heaviest clays to the lightest sands. The yield varies from 10 or 12 bushels per acre to as high as 50 or 60 bushels. This great variation in yield is due not so much to the difference in the quality of the land upon which it is grown as to the difference in method of preparation, fertilization, planting, and cultivation. Ordinarily the land is not prepared as it should be, the fertilization is done usually without proper care as to the needs of the crop, the planting is done by hand and is therefore irregular, the rows are placed too far apart and the plants stand too far part in the rows, so that a good stand is very seldom seen, and the cultivation is usually done with the same implement that was used for breaking the land. In such cases as this the result is always a poor yield. On the other hand, there are a few farmers in the county who know how to grow corn, and practice modern methods in the work of preparation, fertilization, planting, and cultivation. The result is a good crop, ranging in yield from 35 to 60 bushels per acre.

The corn rows are usually laid off 6 to 8 feet apart; generally they should not be over 4 feet apart. The grains are commonly dropped 2 to 3 feet apart in the rows; they should not be over 10 to 15 inches. On the sandy lands it is a common practice to plow the rows out quite deep, distribute the fertilizer in the bottom of the furrow and cover it, still leaving it moderately deep. The corn is planted in these shallow trenches. On light land this is a very commendable practice, as it gets the plants down nearer the moist subsoil, but on the heavier lands deep furrows are not necessary. The fertilizer application is usually very light and of a low grade. The best farmers apply from 150 to 300 pounds per acre of 9-3-3 goods. Stable manure or compost is used where it can be had, and the yield is always increased by its use.

The most urgent needs in connection with corn growing in this county are the improvement of the seed, the deeper and more thorough preparation of the land, especially the heavier types, the incorporation of stable manure or green crops, and the lessening of the space between the rows and between the plants.

There are probably more oats grown now in the county than at any time in its history. Some farmers grow this crop extensively, while

others have only a small patch, which they use as winter pasture for their milch cows. When sown in the fall it is used for pasture during the winter. This practice does not seem to lessen the yield of grain to any great extent. Much of the oat crop is not thrashed, but fed in the sheaf. There is a good demand for thrashed oats for horse feed, and the acreage might therefore be greatly extended. Oats are sown in this county at any time from September to the middle of March. A light application of 10-2-2 commercial fertilizer is often sowed with the oats. In other cases no fertilizer is used at the time of seeding, but 75 pounds per acre of nitrate of soda is applied in the spring just before the plants begin to send up the seed stalk. This greatly increases the yield. Yields as high as 60 and 75 bushels per acre are claimed, though a good average yield is 25 to 40 bushels per acre.

Oats are adapted to a wide range of soils, from the heaviest clays to the deepest sands, and are therefore well suited to this area. In the northern part of the county, where the soil is generally very sandy, the farmers would do well to grow more of this crop. It comes off in the early summer in time to sow some other crop and harvest it before time to sow oats again.

The oats grown in Sumter County are always badly infected with smut, a disease which sometimes diminishes the yield as much as one-fourth to one-third. Oat smut may be almost entirely prevented by sprinkling seed oats with a solution of sulphate of copper containing 1 pound of sulphate to every 10 gallons of water. The seed should be spread out on a floor and after sprinkling should be shoveled over to insure wetting all the grain.

There is probably no crop of more importance to the farmers of Sumter County than cowpeas. It can not yet be considered a money crop, although there is a ready market for cowpea hay and seed at a good price. The crop is of most value to this county as a soil renovator, and for this purpose it is used to some extent. It is not the custom to plow under the entire crop, although a few planters have done this and have noticed a great improvement in the soil as a result. It is thought best to allow the plants to become thoroughly ripe before turning the crop under. On the other hand, many good farmers have experienced no unfavorable results from plowing under a heavy crop of green peas. The ideal way to handle a cowpea crop, or any forage crop, is to feed it to live stock and carefully conserve and return the manure to the land, but as in this region not much live stock is kept, the next best thing is to plow the crop under. Such practice gives no immediate or direct return, whereas the feeding method is doubly profitable. Feeding a crop takes away only a very small percentage of its fertilizing value. Not many farmers feel that they can afford to plow under and lose for the time being an entire crop, so the common plan here is to cut the vines for hay or

gather the seed. The cowpea is a nitrogen gatherer, and even though the vines are removed there is considerable benefit derived from the crop by the soil.

Cowpeas are sowed broadcast on unplowed land and then covered with an ordinary turning plow, or they may be sowed between the rows of cotton and corn at the last cultivation. Some are planted in drills and cultivated, a method giving best results if seed is desired. Cowpeas are seldom fertilized. Experiment has shown that nitrogenous fertilizers are never necessary on such crops, for the reason that they are able to get their requirement of nitrogen from the air. In very poor soils it is best to apply a small amount of acid phosphate or muriate of potash, or both together. Some experiments have given best results where acid phosphate was used alone. A 150-pound application of an 8-3 grade of acid phosphate and muriate of potash would be considered liberal and would give splendid results, especially on poor land.

Cowpeas produce from 2 to 3 tons of cured hay per acre. This at \$15 to \$20 a ton is very profitable, aside from the question of soil improvement. The yield of seed per acre varies from 10 to 40 bushels, depending on the soil, fertilization, and variety grown.

There is good reason to believe that alfalfa would do well on some of the soils of the county. The Greenville clay loam in the western part near Plains, if carefully prepared, should produce excellent yields of this crop. For alfalfa the soil must be well prepared by deep plowing and very thorough cultivation so that all weeds are destroyed. This crop in the South does best if it follows a cultivated crop such as cotton or corn. In this section it should be seeded either in September or February. Broadcasting is not advisable on account of the great prevalence of weeds. About 20 to 25 pounds of seed per acre should be drilled in rows 16 inches to 2 feet apart, and the rows kept well cultivated the first year. It is a most profitable crop where it can be grown.

The growing of truck is carried on to a very small extent, although there is a large area of soil well adapted to such crops, climatic conditions are very favorable, and there are good markets and good shipping facilities. Many of the soils here are especially well adapted to the growing of strawberries, and every season there is a heavy local demand for them at high prices. The supply is wholly inadequate.

Cantaloupes are grown in Sumter County to a small extent, and there is no reason why the industry could not be developed on a commercial scale, as there is an abundance of soil well suited to their production. Cantaloupes do well on a wide range of soil types, but seem to do best on a deep sandy loam or sand. These we have here in the Norfolk sand, the Norfolk coarse sand. the deeper areas of

the Norfolk sandy loam, the Orangeburg sand, and the lighter portions of the Greenville loamy sand. The average yield is about 100 crates per acre, and the usual price is \$1 per crate.

At the last cultivation it is good practice to plant cowpeas between the rows, turning the pea vines under after the melons are harvested. Melons and cowpeas should be followed the next year with oats and cowpeas. The best varieties for this section are Rockford, Eden Gem, and Solid Net.

Watermelons are now grown extensively in some parts of the area. Near Andersonville, on the Orangeburg sand and Norfolk sand, some large tracts are devoted to this crop. On the Greenville loamy sand it is said the melons do not develop the proper shape and for this reason not much of this type is used.

Stable manure is excellent for watermelons, but is not available here for large fields, the growers depending mainly on commercial fertilizers and the plowing under of green catch crops. Cowpeas or velvet beans do very well for this purpose and should be used more extensively. It is not generally considered that the use of commercial fertilizers alone is good practice in melon growing.

Commercial fertilizers of low grade are used and the amount is usually not more than 400 to 600 pounds per acre. A good mixture is: Nitrate of soda, 400 pounds; high-grade acid phosphate, 800 pounds; and muriate or sulphate of potash, 200 pounds. This should be thoroughly mixed and applied at the rate of 700 to 1,000 pounds per acre. The best varieties of watermelons for south Georgia are Lord Bacon, Kolb Gem, Rattlesnake, and Jones Jumbo. Kolb Jem is a good shipper, being very hard and resistant, but is of rather inferior quality.

Tobacco has been grown in Sumter County by only one or two farmers, but the soil and climate seem well adapted to it, and the industry might be developed. A recent decline in the prices, however, makes it less inviting than a few years ago. About 1 acre of tobacco was grown under shade in this county last year and it did very well. Seven hundred to 800 pounds per acre in the open and between 1,100 and 1,200 pounds under shade are the yields secured. No tobacco was planted in the county this year (1910).

Peach growing is one of the important industries in Sumter County. The soil, climate, markets, and the railroad facilities are all very favorable to the production and handling of this fruit. It is estimated that over 500,000 trees are now in bearing, and there are single orchards containing as many as 80,000 to 120,000 trees. Most of the larger orchards are owned and operated by stock companies. They have their own packing houses and some of them have private canneries for disposing of the second-grade fruit.



The trees in the majority of the orchards here are set 1 rod apart each way, making 160 trees to the acre, and all the best orchards are carefully cultivated, pruned, fertilized, and sprayed.

Cultivation consists of plowing out the spaces between the trees once a year and using a disk harrow during the time when the fruit is ripening. Sometime during the summer a crop of cowpeas and sorghum is sown and either cut as hay in the fall or plowed under. The use of some such catch crop in the orchards has been found very beneficial to the trees.

Fertilization consists of at least one yearly application of 200 pounds per acre of an 8-1-4 grade of commercial fertilizer.

The trees are given at least one spraying each year with lime-sulphur wash for the control of San Jose scale, leaf curl, and other pests and diseases. Some orchardists use Bordeaux mixture, half strength, as a summer spray for the control of brown rot. This disease is not prevalent, except in wet seasons.

The fruit is picked and packed in small baskets holding about one-half peck each, and six of these baskets are placed in each crate. Some of the fruit is sold in the orchards, and some to buyers at the shipping points, but most of it is shipped to commission houses in the northern cities. The principal varieties produced in Sumter County are the Elberta, Early Bell, and Carmen.

Pears, plums, pomegranates, figs, and many of the small fruits do well here, and could be grown with profit in any part of the county. Pears were planted quite extensively a few years ago, but the blight badly affected the orchards, and now only a few good orchards remain. These are said to be profitable.

The setting of pecan orchards has perhaps already surpassed the planting of Le Conte pears several years ago. Several stock companies have been formed for the purpose of developing orchards, with the object of selling them as soon as the trees are well established. Twenty trees usually are planted to the acre on good strong land, but on this sandy land where the trees will not be so large they may be set somewhat closer. The trees cost from 25 cents to \$1 apiece. The budded varieties bear some nuts the third year after planting, and profitable crops have been secured in five years, but paying crops can not be expected under 10 years, and full crops not under 20 years.<sup>1</sup> The best nuts have sold at retail for as much as 75 cents to \$1.25 per pound. Some orchards in this section are now bringing in handsome profits. While the trees are coming into bearing, cotton, corn,

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<sup>1</sup> Farmers' Bul. No. 124, U. S. Dept. Agr., p. 17.

potatoes, or any of the cultivated crops may be grown on the same land.

It is well to grow a crop of cowpeas on the land at least once in three years, and to plow under the vines or part of them for the enrichment of the soil. Some growers plant pear or peach trees between the pecan trees with the intention of cutting out the fruit trees when the pecan trees are large enough to cover the land. Some of the peach growers in this county are planting pecan trees in the peach orchards with the intention of turning their peach orchards into pecan orchards.

The best time to set pecan trees is from October to March. Some top soil is usually placed in the bottom of holes dug for the trees. These holes are commonly excavated to a depth of 2 to 3 feet and to about the same width. The trees have a long taproot, and should be set at about the depth at which they stood in the nursery. Some cultivation and fertilization are necessary, but that given the catch crops grown between the trees is sufficient. The best varieties of the pecan for this section are Stuart, Schley, Van Deman, Frotscher, and Curtis.

On account of the popular idea in all parts of the South that crops can not be profitably grown without the addition of large amounts of commercial fertilizers, it is certain that great quantities will be used here for many years to come. Since this is the case, the farmers should be urged to use forethought and judgment in purchasing and applying fertilizers. The grade of commercial fertilizer used in this section most commonly is a 10-2-2 brand, in which the phosphoric acid is contained mainly in phosphate rock, nitrogen in cottonseed meal, and potash in kainit or muriate of potash. The use of such a low grade in most cases is plainly not the most economical practice, for a number of reasons. On account of inadequate railroad facilities in certain parts of the county, some farmers must haul their fertilizers from 15 to 18 miles, wherein considerable haulage is wasted in transporting the low instead of the high grades or the straight ingredients.

The home mixing of fertilizers is a subject that ought to be given special attention by every farmer, particularly since it is decidedly the cheaper method and practically the only way the needs of the varied soils and crops, as ascertained through experience, can be met. The common materials used in the commercial fertilizers of the South are as follows: "Acid phosphate" or acid-treated phosphate rock carrying about 14 to 16 per cent of phosphoric acid, cottonseed meal, fish scrap and tankage as nitrogen carriers, and kainit and other commercial salts of potash, as the sulphate and muriate, as carriers of potash. Fertilizer of any grade desired may be formulated by multiplying the amount of each material used by the percentage of

plant-food ingredient it contains and dividing the result by 2,000, the number of pounds in a ton. Nitrate of soda and sulphate of ammonia are both strong nitrogenous fertilizers, but on account of their extreme solubility they are most profitably used as top dressings after the crop is well started. On heavy clay land the amount of potash in the fertilizer may be reduced, but as a rule it should be increased on the lighter, more sandy lands. The nitrogen part of a fertilizer may be greatly reduced or left out altogether if abundant crops of cowpeas or velvet beans are grown and returned to the soil.

Farm tenure in this county is much the same as in all parts of the South. Negroes do most of the work, either for the landowner or for themselves. Labor by the day is paid 50 to 75 cents and by the month \$12 to \$13, with provisions. Much of the land is worked by negro tenants, who furnish one-half the fertilizer and get one-half the crop produced. The owner usually must furnish each renter with about \$10 a month for running expenses, taking a lien on the crop as security. Those tenants who own stock and tools rent land according to the number of mules they own, and pay to the owner 1 to 2 bales of cotton for each mule worked. The amount of land for each mule varies from 20 to 40 acres. Good is certain to result from the plan, which now seems to be gaining in favor, of reducing the number of acres worked by each mule. Formerly it was the custom to get over as many acres with one mule as possible, and about 40 acres was popularly considered a one-horse farm; now the more usual allotment is 20 acres, the same rental being charged. This is certain to induce the negroes to do better farming and to grow more cotton per acre. They are learning that as much may be grown on 20 acres as they formerly grew on 40 acres.

#### SOILS.<sup>1</sup>

Sumter County lies wholly within the Coastal Plain, its northern boundary being about 28 miles south of the Piedmont line. The soils are predominantly sandy, but there is sufficient range in their characteristics for the development of an intensive and varied agriculture. Twenty-two distinct soil types were established in the survey, each of which differs from the other in some degree in agricultural value, in productiveness, crop adaptation, manurial requirement, or requisite cultural method. The differentiation leading to the mapping of these 22 soils was based principally upon differences in origin of the material; in texture, or the relative content of coarse and fine sands, silt, and clay; in drainage condition; in content of organic matter; in color; in the presence of concretionary pebbles as indicative of important soil conditions; and upon differences in structure, or that arrangement of soil particles affecting properties of compactness and plasticity. Most farmers look upon those properties of a soil which

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<sup>1</sup> This chapter was written by Hugh H. Bennett, in charge of Southern Division.

govern its working qualities, drainage, and relation to the conservation of moisture and manures as of paramount importance; and, indeed, such properties do hold first place with very many crops, but for best results with other crops soils may be required which possess other properties, as, for example, the best colored and flavored sugar-cane sirup can not be grown on the red Greenville soils of Sumter County, although these hold moisture well, are well drained, and easy to cultivate.

For the best quality of sirup those soils having these qualities, and in addition a yellow friable sandy clay subsoil, are required. This point is touched upon here simply to illustrate the fact that in the soil survey all soil properties which are found to have any bearing upon the yield and quality of crops are taken into consideration.

The various grades of land, except in case of stream bottoms, have been classified as coarse, medium, and fine sands, gravelly loams, sandy loams, fine sandy loams, loams, clay loams, and clay; and these grouped into series of red soils, black soils, soils with yellow subsoils, etc. Some types, as shown in the map, in places necessarily include small patches of other types too small to show on the scale used (1 inch to the mile).

Sumter County embraces five well-defined soil divisions, namely: (1) Soil (Sumter stony sandy loam) derived through the decay of consolidated material or limestone which was formed in the sea that in past ages covered all of south Georgia; (2) soils formed under good drainage conditions from unconsolidated materials laid down by water over the limestone formation, including the Orangeburg, Greenville, Norfolk, and Tifton series; (3) soils formed under poor drainage conditions from unconsolidated materials laid down over the limestone, including the Portsmouth; (4) alluvial soils recently formed by deposition of material from the overflow waters of streams, including Meadow (Ocklocknee material) and Swamp; and (5) second bottom or old stream alluvium represented by the Kalmia sandy loam.

The one type in the first division, the Sumter stony sandy loam, is the only soil in the county that is unquestionably derived from the Vicksburg-Jackson limestone formation which underlies most of the area. This limestone rarely outcrops, seldom being encountered at depths less than 6 to 10 feet. On slopes and knolls where erosion has removed the surface covering it has broken down through the agencies of weathering and given rise to this very distinct, yellowish soil, which in spite of its excessively stony character, due to the presence of resistant cherty fragments, gives excellent yields of crops wherever carefully handled.

The four series of the second division of soils derived from well-drained unconsolidated material have each distinctive characteristics



of considerable agricultural importance. The Greenville soils are characterized by the reddish-brown to dark-red color and the loamy characteristics of the soil proper and by the dark-red color of the subsoil. These are strong soils, producing heavy yields, especially of cotton, corn, and forage crops.

It has been suggested by some that these soils, as well as a large part of the land of Sumter County, have been derived from the Vicksburg-Jackson formation, but there seems considerable reason to believe that they are from the Lafayette. The material of the Greenville is identical in color, structure, and surface configuration with the Greenville of other Southern States—for instance, that in Alabama, much of which has long been considered Lafayette. The agricultural value and crop adaptations are the same as for the corresponding types derived from the Lafayette in Alabama. Strata and pockets of white sand with occasional lenses and thin seams of clay are often found between the red Greenville material and the underlying limestone.<sup>1</sup> Again, the soil which is plainly derived from the Vicksburg-Jackson is of a yellow color and in every respect quite unlike the Greenville. The question of origin, however, is not of very great importance in this case at this time, and whatever doubt there may be in regard to the genesis of the type will likely be cleared up by the geologist. All the important types have been carefully separated out and mapped, so that any revision of the geology of the region would not affect the soil map, but only the correlation of the soils.

The Orangeburg soils are closely related to the Greenville, differing mainly in the gray color and loose structure of the soils, the subsoils being quite like those of the Greenville. The several types of the Orangeburg series are not as productive as the corresponding Greenville soils.

The Norfolk soils are characterized by the gray color of the surface soils and the grayish-yellow to yellow color of the subsoils. Except in case of the sand types, which consist of loose sand throughout the soil profile, the subsoils consist of quite friable yellow sandy clay. In agricultural value the Norfolk soils usually are somewhat lower than the corresponding members of the Orangeburg.

The Tifton soils in color and structural characteristics are quite like the Norfolk, the most important difference being the abundance of small reddish-brown to red ironstone pebbles. These "pebbly" or "pimply" soils form excellent agricultural lands, adapted to a wide range of crops.

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<sup>1</sup> About 1 mile west of Spring Hill Church, on the public road, west side of Parkers Mill Creek, the Greenville is underlain by a nonfossiliferous stratum about 4 feet thick, consisting of the common variegated substratum of this as well as the Orangeburg, Tifton, and Norfolk series (mottled red, yellow, and drab or gray sandy and clayey material with some iron crusts), and this in turn is underlain by strata of white and reddish almost pure quartz sand. This would indicate that the variegated substratum so common under these soils is not from the Vicksburg-Jackson, which is a much thicker fossiliferous formation.

The Portsmouth soils, formed under poorly drained conditions from probably the same material that gives rise to the Greenville, Orangeburg, Norfolk, and Tifton, are characterized by the dark-gray to black color of the surface soil and the light-gray or mottled gray, yellow, and red of the subsoil. The Portsmouth soils are developed in depressions where semiswampy conditions have favored accumulation of considerable quantities of dark organic matter in the soil, and at the same time inhibited thorough aeration of the soil material. They require artificial drainage for their reclamation for agriculture.

The recent alluvial soils occupying the stream bottoms have been derived from the varied materials of the entire drainage basins of the streams along which they occur, having been transported by water and deposited during overflows. The types included in this division, Meadow (Ocklocknee material) and Swamp, are being added to by each overflow. They are kept in almost permanent soggy condition and require artificial drainage and protection from overflow in order to be brought under tillage.

The old alluvium soil, the Kalmia sandy loam, is developed as a second-bottom or terrace, representing material deposited mainly at a time when stream overflows reached higher levels. Such land now stands above all but exceptionally high overflows and on that account is much better drained and more thoroughly weathered than the recent lower lying alluvium. Land of this kind represents an intermediate stage of soil development between the soil of the little weathered first bottom and that of the thoroughly weathered, well-drained uplands.

The following outline will show clearly the origin and relation of the several soils of Sumter County:

Soils derived from decay of consolidated material: Vicksburg-Jackson limestone .....	.....	Sumter stony sandy loam.
Soils derived from unconsolidated water-deposited material under good drainage conditions.....	Reddish-brown to dark-red soils, dark-red subsoils.....	Greenville gravelly sandy loam.
		Greenville loamy sand.
		Greenville sandy loam.
		Greenville gravelly clay loam.
		Greenville clay loam.
	Gray soils, red subsoils..	Orangeburg coarse sand.
		Orangeburg sand.
		Orangeburg fine sand.
		Orangeburg sandy loam.
	Gray soils, yellow subsoils.....	Norfolk coarse sand.
		Norfolk sand.
		Norfolk sandy loam.
		Norfolk fine sandy loam.
	Gray to brown soils, yellow subsoils. Iron-stone pebbles abundant.....	Tifton sand.
		Tifton sandy loam.

Soils derived from unconsolidated water-deposited material under poor drainage conditions ....	.....	Portsmouth sand. Portsmouth sandy loam. Portsmouth clay.
Undifferentiated recent stream alluvium, little weathered.....	{ Soil material existing under poor drainage conditions..... } { Soil material existing under excessively poor drainage conditions... }	Meadow (Ocklocknee material). Swamp.
Old alluvium of high terrace, standing above normal overflow, intermediate in stage of weathering.	.....	Kalmia sandy loam.

Under the soil-type descriptions given in the subsequent pages each type is discussed in detail, its characteristics described, and its crop value and crop adaptations set forth.

The following table gives the names and areas of the several soils shown in the accompanying map :

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Greenville loamy sand.....	73,600	22.6	Sumter stony sandy loam....	1,984	0.6
Greenville sandy loam.....	65,408	20.3	Norfolk coarse sand.....	1,920	.6
Norfolk sandy loam.....	37,248	11.6	Orangeburg coarse sand.....	1,792	.6
Greenville gravelly sandy loam	34,496	10.7	Portsmouth clay.....	1,664	.5
Greenville clay loam.....	27,392	8.5	Orangeburg sandy loam.....	1,088	.3
Tifton sandy loam.....	16,768	5.2	Portsmouth sand.....	960	.3
Norfolk sand.....	15,168	4.7	Orangeburg fine sand.....	768	.3
Swamp.....	13,056	4.1	Kalmia sandy loam.....	704	.2
Meadow (Ocklocknee material).....	11,264	3.5	Tifton sand.....	512	.2
Portsmouth sandy loam.....	6,784	2.1	Norfolk fine sandy loam.....	64	.0
Greenville gravelly clay loam	5,760	1.8	Total.....	322,560	.....
Orangeburg sand.....	4,160	1.3			

GREENVILLE GRAVELLY CLAY LOAM.

The soil of the Greenville gravelly clay loam to a depth of 4 or 5 inches is a reddish-brown, heavy sandy loam carrying sufficient clay to have very nearly the working qualities of a friable clay loam. Numerous small iron concretions are scattered over the surface and disseminated throughout the soil. The subsoil is a comparatively friable red sandy clay, which becomes heavier as depth increases. Usually at a depth of 5 or 6 feet mottlings of yellow and drab are found in the red material, giving the substratum a decidedly variegated appearance. In many places the yellow of the underlying material becomes more prominent, and finally the red disappears altogether.

The pebbles or ironstones of this type, as well as those of all the other types where such gravel is found, are the result of cementation and indurating processes, which doubtless are in active progress in undisturbed portions of the soil. They consist principally of sand cemented together by the oxides of iron, and vary in color from light yellow to dark red or even nearly black. The lighter colored ones are usually soft and the dark ones quite hard.

This difference is recognized by the farmers here, and they believe that a different agricultural value is attached to land having one or the other predominating. The reason for such belief is not apparent. The pebbles have a beneficial effect on the soil by keeping it loose and open, but their color and density would hardly seem to be important factors.

The Greenville gravelly clay loam occupies the more sloping areas in bodies of Tifton sandy loam. It is usually found near the heads of stream courses. The largest single body lies just east of Browns Mill on the Murrays Ferry road.

The surface drainage is good, the water from heavy rains draining rapidly away; but on account of the large quantity of pebbles on the surface there is little erosion. Terracing is, therefore, usually not necessary. The soil has good water-holding capacity where cultivation has been deep and thorough; but owing to the usual shallow plowing practiced here much of the soil has become very compact, and the crops often suffer, for this reason, from the effects of continued dry weather. Where the common small moldboard plow has been used there usually is a compacted stratum just below plow depth, caused by the pressing of the plow upon the underlying material. This may be broken up by deepening the plowing gradually from year to year.

The crops best suited to this soil are cotton, corn, oats, rye, and some of the forage crops. Wheat does very well on the type, but little is grown. Some of the best yields of cotton produced in the county have been secured on this type. It is a good strong soil, and if deeply plowed and carefully fertilized with compost or stable manure and some commercial fertilizer it will produce remarkably large yields. The tendency to compact makes it rather expensive to till. This undesirable condition could be remedied materially by loosening up the soil through the incorporation of organic matter in the form of stable manure or cowpeas. Winter cover crops, such as oats, vetch, or rye, should be grown. These could be used for pasture during dry spells, when the land is not likely to be compacted or puddled by tramping. In the spring such crops should be turned under and the land prepared for cotton or corn. With such treatment this land may be made to produce very much heavier yields with only a small outlay for commercial fertilizers.



One very successful corn grower on this type breaks the land deep, running a subsoiler in the furrow and then cross plowing at right angles with deep furrows in which the subsoiler is also run. Fertilizer is then applied at the rate of 300 pounds per acre and covered shallow, leaving the furrow still quite deep. Corn is then planted in these deep rows, which are run at intervals of 4 feet, the plants being thinned to stand 18 inches apart. In June an additional application of high-grade commercial fertilizer is made at the rate of 300 pounds per acre, and later when the ears begin to form nitrate of soda is added at the rate of 75 pounds per acre. At the last cultivation cowpeas are sown between the corn rows and these with the corn stalks are plowed under in the fall. With this method yields of 40 to 50 bushels of corn per acre are secured and at the same time the soil is made more productive.

Oats grown on this soil should have an application of at least 300 to 400 pounds of an 8-2-2 brand of fertilizer per acre, together with 75 pounds of nitrate of soda in the spring. After the oats are off the land may be used for cowpeas. An acreage application of something like 300 pounds of acid phosphate is considered by some to be a profitable treatment for crops.

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

*Mechanical analyses of Greenville gravelly clay loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23405.....	Soil.....	1.1	8.1	11.3	29.3	21.1	15.0	14.4
23406.....	Subsoil.....	1.3	6.1	10.6	28.2	16.8	12.8	24.0

GREENVILLE CLAY LOAM.

The Greenville clay loam, to a depth of 4 or 5 inches, is a red or reddish-brown heavy sandy loam to clay loam. The subsoil is a stiff, red sandy clay, which becomes slightly more sandy at a depth of 36 inches. Mottlings of red and drab or gray are usually found at 4 to 6 feet. Small quantities of ironstone concretions and a slight sprinkling of waterworn gravel composed of other rock are to be seen in places scattered through the soil and over the surface.

The surface is almost flat to gently undulating. Large level areas of the type occur in the western part of the county, and small irregular areas are found on the slopes of stream divides and about the heads of streams. In the large flat area of this type near Plains are found small, slightly elevated bodies of the sandy loam type of the same series.

The more undulating portions of the Greenville clay loam have perfect surface drainage, and erosion is in places rather serious, making terracing necessary. Where neglected these areas wash into deep gullies, and much of the waste land of the county owes its origin to this cause. On the level areas erosion does not occur, but some trouble is experienced through the soil remaining too wet to be worked for a considerable time after heavy rains. It is necessary that the moisture condition be right before any cultivation is done. If too wet, the soil breaks into compact clods, which are difficult to work down; if too dry, the land is difficult to work because of a hardened structure. If deeply broken and properly cultivated, the soil is quite retentive of moisture and crops rarely suffer from the effects of drought. On the other hand, shallow breaking and the formation of a plowsole comparatively near the surface has in the case of some fields so reduced the opportunity for absorption of the rain that the crops suffer from the effects of dry weather much more quickly even than on some of the lightest soils of the county. If worked in the proper way, the soil will give as good yields as any other soil in the area.

The type generally is in need of organic matter. In many places the soil is so compact at times that two heavy mules can hardly draw a plow through it. On one of the large farms of this type a gang plow drawn by a heavy traction engine is being used with success, especially when the moisture content is exactly right. Where too wet the soil has been badly compacted under the wheels of the engine.

The type is well adapted to the growing of crops requiring a heavy soil. With thorough tillage and manuring two bales of cotton per acre have been grown. Corn gives heavy yields where deep plowing and subsoiling has preceded the planting of the seed. Oats, rye, sorghum, and some of the forage crops, such as cowpeas and velvet beans, are successfully grown. Crimson clover and vetch would probably thrive. Corn, oats, and cotton, with the intermediate forage or catch crops, would constitute a good rotation.

Commercial fertilizers are used in large quantities. In fact, some of the owners depend entirely on this means to maintain or increase their yields. This is decidedly a bad practice, as no type in the county is more in need of vegetable manures, and none more susceptible to improvement by their use.

The large areas of this soil in the western part of the county, by reason of their good location and the high agricultural value of the soil, are among the highest-priced lands in Sumter County. Very little of this land is for sale.

The results of mechanical analyses of soil and subsoil of the Greenville clay loam are given in the following table:

*Mechanical analyses of Greenville clay loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23407.....	Soil.....	2.5	24.3	16.5	16.0	10.5	10.5	19.8
23408.....	Subsoil.....	1.5	17.5	13.4	13.7	8.6	11.2	34.4

GREENVILLE GRAVELLY SANDY LOAM.

In the east-central part of the county, and in small areas in some other parts, is found a considerable extent of the Greenville gravelly sandy loam, a soil which resembles the Tifton sandy loam in carrying a large amount of small iron concretions over the surface and throughout the soil mass, but which differs from it in having a red color. The surface soil is a reddish-brown sandy loam thickly strewn with the common ironstone gravel of the region. The subsoil below a depth of about 7 to 10 inches is a dark-red to brownish-red sandy clay which also carries ironstone pebbles. These are in places collected into a compact gravelly stratum from a few inches to 10 or more inches in thickness. Aside from the gravelly condition the type is very similar to the Greenville sandy loam.

This soil is usually found in close proximity to the Tifton and Greenville sandy loam. It is as productive a soil as either, and the methods of cultivation, crops, and crop yields are much the same. The high content of pebbles is favorable in many ways, allowing the soil to be worked under a wide range of moisture conditions without danger of subsequent baking. The soil has good surface drainage and underdrainage and at the same time retains a sufficient supply of moisture when carefully handled. Organic manures are much needed and where applied even in small quantities the yield of crops is surprisingly increased. Cotton, corn, oats, and forage crops give very good yields. An average of 1 bale of cotton per acre should be secured.

This type comprises much of the high-priced land of the county. Where railroad facilities are reasonably near at hand, the land sells for \$40 to \$50 an acre. Much of it is not for sale. This is a very desirable grade of land, capable of giving profitable returns with careful cultivation and moderate fertilization.

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

*Mechanical analyses of Greenville gravelly sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23403.....	Soil.....	1.1	5.8	12.9	35.3	16.4	14.3	14.2
23404.....	Subsoil.....	1.2	7.5	11.0	32.4	12.9	9.9	24.9

GREENVILLE SANDY LOAM.

The top soil of the Greenville sandy loam to a depth of 6 or 9 inches is a brown or reddish-brown light sandy loam of medium texture, the color becoming somewhat redder as the depth increases. The subsoil is a red to dark-red medium sandy clay, becoming heavier with increase in depth. Occasional pockets of almost pure white sand are encountered in the subsoil.

The type occupies rolling uplands between streams, from which it is separated by belts of Orangeburg sand or Greenville loamy sand. The topography is such that natural surface drainage is good, and in some places terracing is necessary to prevent injurious erosion. This is one of the soils on which it is important to keep a growing crop as much of the time as possible. Such crops check erosion and are beneficial in many other ways.

The largest bodies of this type are found in the central, northern, and eastern parts of the county. It is of large extent and of high agricultural value. Much of it is yet in forest, consisting of pine, oak, hickory, walnut, elm, holly, horse chestnut, and other species of trees. Most of the marketable timber has been removed. On much of this type, as on practically all the soils of the county, there are many stumps yet standing which interfere with cultivation. Farmers are not making the effort they should to get rid of stumps, which on soils having the favorable topography of the Greenville sandy loam are retarding the use of modern labor-saving machinery on many farms.

Where this soil is deeply plowed and the surface kept well cultivated with shallow-running implements, the water-holding capacity is good. Too much farming is done with crude tools, which little more than scratch the surface, with the result that crops often suffer from restricted root development and an insufficient supply of water.

Cotton, corn, small grain, and forage crops are grown on this type. The usual yield of cotton is about one-third bale per acre, but this may be greatly increased with better culture. One bale per acre can be grown easily under the most favorable conditions. The aver-



age crop of corn is not more than 12 to 15 bushels per acre, although from 30 to 40 bushels have been secured in many instances. Splendid crops of oats and cowpeas are grown. As on all other types, commercial fertilizers are too largely depended upon for the production of crops. Fertilizers when used discriminately unquestionably give profitable returns, especially cottonseed meal in moderate applications. Marked improvement is noticed where organic matter has been incorporated.

The most urgent needs of the type are deep preparation, the incorporation of green crops or stable manure, and frequent and shallow cultivation.

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

*Mechanical analyses of Greenville sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23401.....	Soil.....	2.6	10.1	14.4	36.9	19.6	8.1	8.1
23402.....	Subsoil.....	2.0	8.4	10.4	29.8	15.7	7.1	26.4

GREENVILLE LOAMY SAND.

The surface few inches of the Greenville loamy sand is a brown to reddish-brown medium to rather coarse sand, while the subsurface is a brighter red loamy sand to rather coarse loamy sand, becoming heavier as depth increases. The subsoil to a depth of 24 inches is a red sticky sand, which in turn is underlain by a rather stiff sandy clay, sometimes slightly mottled with gray or light yellow. In many places at a depth of 12 to 20 feet are found layers and cross beds of pure sand, often almost perfectly white and interstratified with thin, paperlike layers of very plastic white clay. In places irregular sheets and tubes of locally formed ironstone are found, and small deposits of water-worn gravel are often encountered in the subsoil.

The type occupies rolling interstream areas and occurs also as broad belts bordering all the streams of the county. The width of these belts varies with the size of the stream. Where the streams are of considerable size and close together these sand belts unite to the exclusion of all other types. Large areas of this soil are found in the northern and western parts of the county.

The drainage of the type, on account of its topography and its open character, is perfect, but it has fairly good water-holding capacity. Corn, cotton, oats, and the forage crops are grown upon it. Fair yields of all the crops grown in the area have been produced on this soil, but too little attention has been given the impor-

tant question of the crop adaptation of the type. Oats, truck, and the forage crops should be given more important places in the agriculture practiced on this type.

Pecans in all probability would give very good results. The soil can be very much improved by incorporating organic matter, particularly the legumes, such as cowpeas and vetch. Velvet beans also are very effective in improving the moisture condition by shading the land and by supplying needed organic matter to absorb and retain the soil moisture. Where cotton is grown some kainit is needed to prevent "rust" or shedding. High-grade fertilizers, especially nitrogenous brands, can be profitably used where the soil is kept supplied with organic matter.

The Greenville loamy sand is classed among the cheaper lands of the county and much of it is for sale.

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

*Mechanical analyses of Greenville loamy sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23396, 23398..	Soil.....	1.1	24.3	25.3	24.5	13.5	7.1	3.9
23397, 23399..	Subsoil.....	1.0	20.5	24.1	22.9	11.0	9.6	10.6
23400.....	Lower subsoil...	2.3	27.2	15.9	15.6	11.9	9.3	17.8

ORANGEBURG SANDY LOAM.

To a depth of about 10 to 12 inches the Orangeburg sandy loam is a light-gray to light-brown (with slightly reddish tinge) loose sand of medium texture. An accumulation of organic matter has in places given the surface soil a darker color than is typical. At 9 inches the soil becomes slightly red. The subsoil is a red sticky clay which becomes heavier as depth increases.

This soil is found in about the same location and position as the Greenville sandy loam, and has had apparently the same origin. The only difference between the two soils is the greater depth of surface soil of the Orangeburg, and a more loamy condition of the surface soil of the Greenville type. The Orangeburg sandy loam is most extensively developed in the northern part of the area, where it is found occupying high interstream divides.

The type being quite rolling and the top soil being of a very open nature the drainage is perfect. Very heavy rains cause the soil to wash badly, but moderate rains are largely absorbed and given up gradually. The moisture condition is ordinarily very good. On the steeper parts there are often found eroded spots where the sandy

clay of the subsoil is exposed. Such places need terracing and the incorporation of organic matter. The soil generally is also in need of compost or some other form of vegetable matter, although it seems to produce better crops under poor conditions than any other type in the county. It does not become compacted under long-continued shallow cultivation, does not usually become droughty under the same conditions, and, in short, will stand careless handling better than any other soil.

The principal forest growth consists of longleaf pine, oak, beech, maple, dogwood, and elm. Much valuable timber has been removed, the longleaf pine being the principal lumber tree. Most of the type is now cleared and under cultivation.

The Orangeburg sandy loam may be considered a general-purpose farm land, as it will produce good yields of all the crops grown in this latitude. On account of the depth of the surface soil in many places and its light open character, the type is not considered the best for the growing of cotton and corn, though it is used more largely for these crops than any other. The latter statement is true of practically all soils in the county.

The crops best suited to this soil are those requiring a loose open seed bed, such as oats, cowpeas, vetch, velvet beans, and some other forage crops and truck. If forage crops were extensively grown on this type and plowed under, corn and cotton might be more profitably grown. Sweet and Irish potatoes are very well adapted to this soil. With liberal fertilization and the application of some barnyard manure, these crops produce as high as 300 bushels per acre. Some farmers living on this type grow peanuts extensively for hog pasture. The practice is profitable largely for the reason that it is not necessary to remove the nuts from the soil, the hogs doing the harvesting. It is possible to cut a fair yield of hay from the vines before the hogs are turned in. Peaches are well suited to the type.

The commercial fertilizer practices are much the same as on other types. The usual grade is 10-2-2. Experiment would perhaps suggest a more liberal use of the potash fertilizer than on some of the heavier types.

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

*Mechanical analyses of Orangeburg sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23423.....	Soil.....	1.1	11.1	16.8	36.4	14.9	11.3	8.5
23424.....	Subsoil.....	.6	7.0	11.7	27.5	10.2	8.9	34.1

## ORANGEBURG FINE SAND.

The top soil of the Orangeburg fine sand, to a depth of 6 to 8 inches, consists of a gray to pale reddish-gray or light-brown fine sand to loamy fine sand of very uniform texture. The subsoil is a light red, friable, loamy fine sand to sticky fine sand or fine sandy clay.

In the southern part of the county this type is slightly undulating to almost flat, and exists there in only one small area. In the northern part it is more rolling and the sand of the top soil is deeper, while in the southern part it approaches more nearly a loamy fine sand or light fine sandy loam.

The loose, open nature of the soil affords thorough natural drainage, and crops often suffer from drought, especially on the more sandy phase, though the fineness of the texture enables this soil to withstand drought better than the coarser sands.

With deep and thorough preparation and frequent shallow cultivation the Orangeburg fine sand produces very satisfactory yields of cotton and corn. Cowpeas and oats also do well. It requires heavy fertilization, especially with nitrogenous and potassic fertilizers, for the best results. An application of stable manure or compost is especially beneficial, the good effects being noticeable for many years. Organic matter in the form of cowpeas or rye turned under is very beneficial, going far toward the establishing of better moisture-retaining powers.

In the southern part of the county this type is all cleared and under cultivation. In the northern part it is very little used, being largely forested interstream ridges lying near the Flint River.

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

*Mechanical analyses of Orangeburg fine sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23421.....	Soil.....	0.4	5.2	7.5	71.0	5.3	5.4	5.3
23422.....	Subsoil.....	.3	3.4	7.4	70.1	5.4	4.6	8.6

## ORANGEBURG COARSE SAND.

In the northwestern and western parts of the county are found small areas of the Orangeburg coarse sand, which consists of coarse, incoherent gray to light-brown sand, on the surface of which is usually a considerable quantity of fine quartz gravel. At about 8 to 10 inches the material grades into a light-red, loose, coarse sand which becomes somewhat sticky at 36 inches.



Areas of this soil occupy a position midway between the lowlands along the streams and the surrounding higher land, and seems to be the result mainly of movement from above. The removal of fine material by water perhaps has had considerable to do with the formation of this coarse-textured soil.

The Orangeburg coarse sand is not well suited to the growing of long-season crops, but should be used for truck and forage crops. On some of this land corn is grown. It is certainly a mistake to cultivate this crop, at least on an extensive scale, on such a soil, where more suitable land—heavier soils—can be had. The soil is very much in need of organic matter, such as could easily be supplied by cowpeas, velvet beans, or rye. The type is of only small extent in this county.

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

*Mechanical analyses of Orangeburg coarse sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23417.....	Soil.....	7.5	31.1	15.7	21.1	9.5	10.9	4.1
23418.....	Subsoil.....	6.0	23.0	14.0	24.4	12.1	11.1	9.4

#### ORANGEBURG SAND. .

The soil of the Orangeburg sand is a light-gray or sometimes slightly reddish-gray, loose, incoherent sand 6 to 8 inches in depth. The subsoil is a reddish-yellow sticky sand, which passes gradually into a red sandy clay at a depth of about 15 to 20 inches. The surface features of the type, including color and structure, resemble the Norfolk sand, and it is often necessary to bore into the red subsoil before it can be distinguished from that type.

The Orangeburg sand occupies the tops of high hills and ridges in the northern part of the county northwest of Americus. The drainage is so thorough that only crops of short growing season are profitable, except where the water-holding power is improved by working into the soil large quantities of organic matter, as green manure. Comparatively heavy applications of commercial fertilizers are used for all crops. The amounts necessary for profitable yields could be reduced if more vegetable manures were used.

Some farmers grow cotton on this soil, but the yield is usually low. Forage crops adapted to light soils, truck, and melons should be more generally grown. Watermelons are almost as extensively grown on this type as on the Norfolk sand, and there does not seem to be any great difference in the quality of the product. On the darker sands belonging to the Greenville series, or where the red clay subsoil of

the Orangeburg soils comes near the surface, melons are said often to be misshapen, but on the Orangeburg sand trouble of this kind is not experienced. However, this type is not extensively developed in Sumter County.

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

*Mechanical analyses of Orangeburg sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23419.....	Soil.....	2.4	22.8	15.9	34.3	13.4	6.9	3.8
23420.....	Subsoil.....	3.0	18.0	14.9	31.6	12.5	8.0	11.8

**TIFTON SANDY LOAM.**

The soil of the Tifton sandy loam, to a depth of 6 to 10 inches, is a yellowish-gray medium sandy loam or sand. The subsoil is a compact bright yellow sandy clay. Both soil and subsoil contain large quantities of small ironstone gravel, which is also very abundant on the surface and is especially noticeable after heavy rains. When the soil is first plowed the pebbles are not so apparent, and at such times the soil is often taken for another type closely resembling the Norfolk soils. The content of gravel usually decreases with increase in depth. At 36 inches mottlings of red and deep yellow are sometimes encountered and in places this lower material has the appearance of having been influenced by the Vicksburg-Jackson limestone which underlies the soil at varying depths. The type is locally called "pebbly land" or "pimply land." It is developed in extensive areas throughout the middle portion of the Coastal Plain or southern Georgia.

The Tifton sandy loam occupies areas of considerable extent in the south-central part of the county and is found in small areas in almost all parts. The topography is nearly level to gently undulating. In the sections where this is prominent there are some shallow depressions, in which the Portsmouth soils are found.

The surface drainage of the type is good. On account of the gentle slopes and the high percentage of pebbles erosion is practically unknown. The soil where deeply cultivated is retentive of moisture but is apt to compact in the upper subsoil if long-continued shallow cultivation is practiced without the addition of organic matter.

The Tifton sandy loam is one of the best soils in the county for general farming. For cotton it can be safely said that there is no upland type of similar texture that surpasses it. The light color of the top soil is favorable to the production of clean unstained lint—

a feature that offsets the sometimes heavier yields secured from the Greenville sandy loam. Cotton yields from one-third to 1 bale per acre with the methods commonly employed. With more intensive methods, including the growing of legumes and the incorporation of an occasional green-manure crop—cowpeas, vetch, or rye—an average of 1 bale per acre should be secured. As on all other soils in the county, all crops are fertilized. The average yield of corn is not more than 15 to 20 bushels per acre where the ordinary shallow plowing is practiced. Better methods of culture—for instance, some modification of the Williamson plan—will produce a yield of 40 to 50 bushels or more.<sup>1</sup>

The type is well suited to the growing of sugar cane. The color and texture of the soil and its power to conserve moisture when properly cultivated make it one of the best soils in the county for the production of this crop, especially where large areas are to be grown. Oats, cowpeas, velvet beans, peanuts, and certain vegetables—beans, peas, cabbage, and tomatoes—give very good results. As is the case with practically all the soils in the county, the Tifton sandy loam is in need of organic matter. If it is properly handled and stable manure is added or green crops plowed under and thoroughly incorporated, no soil in the area will yield more satisfactory returns. There is little upland in the South that is better suited to a wide range of crops.<sup>2</sup>

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

*Mechanical analyses of Tifton sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23433.....	Soil.....	2.8	10.2	15.9	40.3	17.0	6.5	7.7
23434.....	Subsoil.....	.9	8.0	13.3	36.9	15.1	7.0	18.7

TIFTON SAND.

The surface soil of the Tifton sand is a medium dark-gray to reddish-gray, rather loose sand, with a depth of 5 to 10 inches, containing a large percentage of small ironstone gravel. The subsoil is a light-yellow loose sand, becoming sticky and frequently assuming a reddish cast at 18 to 25 inches. The subsoil also contains a large percentage of ironstone gravel, which exists as a compact substratum, usually ranging from about 6 to 18 inches in thickness. The depth

<sup>1</sup> See Soil Survey of Scotland County, N. C.

<sup>2</sup> For a further discussion of this soil see soil survey reports of Grady and Tift Counties, Ga.

to this layer varies from 18 to 36 inches. Below the gravel the material is a sticky sandy clay, sometimes mottled with yellow and brown.

The type occupies usually a low position and is closely associated in occurrence with the Portsmouth soils. Most of the type has just recently been cleared of its fine growth of longleaf pine, and by reason of its virgin condition it is quite fertile, producing fairly good yields of cotton, for which crop it has been used almost exclusively.

The Tifton sand is much in need of organic manures—a deficiency that can be remedied with little trouble owing to excellent adaptation to cowpeas and velvet beans. Commercial fertilizers rich in nitrogen and potash give profitable returns. There is only a small extent of land of this type in the county.

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

*Mechanical analyses of Tifton sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23431.....	Soil.....	2.5	14.6	16.6	39.3	12.4	10.5	4.0
23432.....	Subsoil.....	1.1	7.6	11.2	32.4	15.4	10.5	21.7

NORFOLK SANDY LOAM.

The surface soil of the Norfolk sandy loam, to a depth of 6 to 8 inches, consists of a gray to yellowish-gray medium loamy sand to loamy coarse sand with small amounts of ironstone gravel scattered over the surface in many places. Where this gravel is in sufficiently large quantities soil otherwise quite like this type has been included with the Tifton sandy loam. The subsoil is a light-yellow to yellow sandy clay. At depths varying from 5 to 8 feet, mottlings of light red are sometimes found. Fragments of limestone, belonging to the Vicksburg-Jackson formation, are found in spots scattered over the surface. This limestone formation usually underlies the type at a depth of 6 to 10 feet. Outcrops, probably the result of erosion, here and there are responsible for the weathered fragments of rock occasionally encountered on the surface.

The largest areas of the Norfolk sandy loam are found in the southern part of the county. Small tracts are mapped elsewhere, particularly in the eastern and central parts. It is gently rolling to quite level and is well drained. The sandy nature of the surface soil causes it to absorb large quantities of water, and the subsoil is sufficiently retentive to give it good water-holding capacity. It is a soil of high agricultural value, and includes much of the highest-priced land in the county. All the crops grown in this climate do well on the Nor-



folk sandy loam. Cotton, corn, oats, rye, all the forage crops, sugar cane, peanuts, and peaches and pecans do very well. The peaches are of excellent quality and flavor. Corn yields as high as 40 to 50 bushels per acre with liberal fertilization and proper cultivation, especially where handled according to a modification of the Williamson plan of corn culture previously referred to. A bale of cotton per acre, or even more, can be grown by the proper methods, including liberal fertilization with nitrogenous and potassic fertilizers especially and the maintenance of sufficient organic matter to keep the soil in a fairly loamy condition. Cane sirup produced on this type is of fine quality, having a light color and delightful flavor, qualities much desired by the markets. Not as much sirup is produced as could be profitably.<sup>1</sup>

If the soil is well fertilized and well prepared sugar cane will grow well and produce good yields of sirup on the higher land, though many farmers think it should be confined to moist bottom lands.

As much as 50 to 80 bushels of oats per acre is sometimes secured. Careful preparation and high fertilization, with an application of stable manure, are necessary for best results with this crop. Oats give especially good results following a crop of velvet beans.

This soil in places is quite compact on account of the constant cropping without the incorporation of organic matter. Forage crops, such as cowpeas and velvet beans, produce large yields and should be grown and plowed under.

Some farmers believe that large crops of green matter plowed under will cause the soil to sour and injure the crops of the following year. This may be true on lands farther north, where the soil is frozen during a large part of the winter, but it has been shown by experiment in the south that large crops of green pea vines, when plowed under in the early fall, are well decomposed by the first of January. The growing of such crops and plowing them under will obviate the necessity of buying nitrogenous fertilizers, as plants belonging to the leguminous family take nitrogen from the air and store it in the soil. Other effects of such crops on the soil are the improvement of structure and the increasing of its power to conserve moisture. The fertilizer practices are much the same as on all the other types of the area.

Many farmers prefer this soil to the red soils for growing cotton, for the reason that the cotton lint is likely to be stained on the red soils. Land consisting of Norfolk sandy loam sells for \$25 to \$50 an acre, depending upon location. This land at the above prices is considered a good investment in almost any part of the county, for with good tillage and modern methods generally it will pay for itself in a few years.

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<sup>1</sup> For a discussion of sugar-cane culture for sirup see Soil Survey of Grady County, Ga.

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

*Mechanical analyses of Norfolk sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23415.....	Soil.....	1.7	25.9	25.2	22.2	11.7	8.9	4.2
23416.....	Subsoil.....	2.3	17.1	17.4	16.2	8.2	5.6	32.9

NORFOLK FINE SANDY LOAM.

To a depth of 7 to 10 inches the soil of the Norfolk fine sandy loam is a gray or yellowish-gray loamy fine sand to light fine sandy loam, ranging rather coarse in places. The subsoil is a light-yellow to yellow friable fine sandy clay. Frequently as depth increases the content of sand in the subsoil increases and the color becomes brighter.

The type is found in only one small area in the northern part of the county, north of Andersonville. This one area is almost flat, but the drainage seems to be good, owing to the sandy nature of the subsoil.

The Norfolk fine sandy loam is a good cotton soil, producing easily a bale to the acre under good management. Corn also does well, and very good yields are made. Sugar cane does especially well, the sirup being very fine in flavor and color. Forage crops make excellent yields. They should be more extensively grown, as the type is in need of organic matter. It is also an excellent peanut soil. The nuts have the color desired by markets. Peanuts, however, are mainly grown as hog forage in this section.

Because of its small extent, this type is not of great importance in this county.

The following table gives the results of mechanical analyses of soil and subsoil of the Norfolk fine sandy loam:

*Mechanical analyses of Norfolk fine sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23413.....	Soil.....	1.1	13.1	9.3	22.4	23.8	20.3	9.8
23414.....	Subsoil.....	1.5	9.2	6.6	15.9	18.3	13.0	35.2

## NORFOLK COARSE SAND.

The soil of the Norfolk coarse sand is a loose, coarse sand, with a depth of 5 to 8 inches and gray to yellowish-gray in color. The subsoil is a light-yellow, loose, coarse sand, which extends to a depth below 36 inches. A considerable quantity of fine waterworn gravel is present in both soil and subsoil.

The type occupies flat to gently rolling interstream areas along Muckalee Creek and other larger streams. It is of low agricultural value for general farming, but is well adapted to the growing of melons and early truck. Very little of the type is under cultivation. A small tract near Americus has been used for growing watermelons, and it is reported that good yields are obtained. Liberal fertilization is necessary, and applications of barnyard manure or compost have been found profitable. The soil is very much in need of organic matter. Crops like cowpeas and rye should be plowed under to supply this deficiency.

The type is not extensive in this area and is therefore not important.

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

*Mechanical analyses of Norfolk coarse sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23409.....	Soil.....	8.3	23.3	12.9	29.0	14.7	9.4	2.5
23410.....	Subsoil.....	6.9	22.3	13.3	28.3	17.2	9.9	2.3

## NORFOLK SAND.

The surface soil of the Norfolk sand to a depth of 5 to 9 inches is a gray or light yellowish gray medium, incoherent sand. The subsoil to 36 inches and below is a light-yellow loose sand. In places an accumulation of organic matter has made the top soil somewhat dark.

The type in places represents a mantle overlying the red material of the Orangeburg and Greenville series. It varies in thickness from 3 to 10 or 12 feet, and occurs mainly in the uplands. Some patches occur along the slopes to the larger streams. The largest bodies of the type are found in the northern part of the county near Andersonville and southeast of Cobb in the southeastern part of the county.

The topography varies from quite level in the southern part of the county to rolling in the northern part, where it is often found as caps on the higher hills. On account of the loose, open character of this soil it does not retain moisture well. The timber growth is principally scrub oak and pine.

The Norfolk sand of this county is not well suited to the growing of long-season crops, such as cotton and corn. It is a warm soil and crops mature quickly. For this reason it is well adapted to the production of early truck and melons. It is known as the watermelon soil of the county. Some of the gray sands belonging to another series are also called watermelon soils, but this is the best type for that purpose. Before the discovery that this type would grow melons it was considered almost worthless.

In growing melons an application of 300 to 400 pounds of commercial fertilizer to the acre, together with about 50 pounds of sodium nitrate, is usually made. Some stable manure is used where available. Two acres will produce 1,000 to 1,200 melons, or one carload. The price generally ranges from about \$75 to \$100 per acre. Much of this land is still covered with a scanty growth of scrub oak, but this can be easily removed and the land put under cultivation. The Norfolk sand is very low in organic matter and would be greatly improved by frequent incorporation of organic manures, for which green crops of cowpeas or rye may be used.

The price of land of this type varies from about \$5 to \$15 an acre, but it is sure to have a higher value when it becomes more generally used for truck and melons.

The results of mechanical analyses of soil and subsoil of the Norfolk sand are given in the following table:

*Mechanical analyses of Norfolk sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23411.....	Soil.....	1.9	12.7	13.4	46.6	16.1	6.9	2.3
23412.....	Subsoil.....	3.4	14.3	13.6	44.7	14.0	6.1	3.4

PORTSMOUTH SANDY LOAM.

The surface, 3 to 6 inches, of the Portsmouth sandy loam is a dark-gray to black heavy sandy loam to loam carrying a high percentage of partially decayed organic matter. The subsoil is a light-gray or ash-colored sandy clay, with a considerable content of silt. At a depth of 18 to 30 inches the subsoil is mottled with splotches of reddish brown and yellow.

This type occupies shallow, irregular depressions, probably lime sinks, in the southern and eastern parts of the county. The areas almost invariably have natural outlets through which much of the finer material, brought down by drainage water, is carried off. Some water usually stands on them on account of the shallow, obstructed

condition of the drainage channels, through which water flows only in times of excessive rains.

Both the drainage courses leading from these areas and the areas themselves are covered with a dense growth of water-loving trees and plants, such as cypress, magnolia, bay, sweet and black gum, soft maple, gallberry, and various other small plants and vines.

A few Portsmouth sandy loam areas have been cleared and are now in cultivation, but such reclamation has required considerable time and effort. After the vegetation is removed it is necessary to deepen the drainage outlets. After thorough drainage, it generally takes one or more years for the soil to be put into proper condition for good plant growth, owing to the unhealthful condition of the soil material, resulting from poor drainage and consequent lack of aeration. An application of 1 to 2 tons of burned lime per acre almost always improves the reclaimed Portsmouth soils. One or two farmers in the county have tried this with satisfactory results.

Cowpeas seem to be the crop best suited to this soil when first cleared, although no crop has given very satisfactory returns at first. In some sections Irish potatoes and tomatoes are successfully grown on freshly reclaimed Portsmouth sandy loam. After a few years fine crops of corn are secured with little or no fertilizer. Cotton does not do well, the plants tending to grow too much to "weed." Celery, onions, and other truck crops are well suited to soil of this character.

The Portsmouth sandy loam should be reclaimed and put into cultivation for several reasons. It is one of the best soils in the county when brought into proper condition for tillage. Moreover, the areas are low lying and contain stagnant water much of the time, making the surrounding country unhealthful, owing to the breeding of mosquitoes. Where these wet areas are abundant it is difficult to induce prospective settlers to locate. For this reason, land which includes much of the type generally brings a much lower price than higher lying land or land of the same type when drained. The type is locally known as "gallberry land."

Below are given the results of mechanical analyses of samples of the soil and subsoil of the Portsmouth sandy loam:

*Mechanical analyses of Portsmouth sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23427.....	Soil.....	0.9	4.7	9.6	22.9	16.0	30.0	15.8
23428.....	Subsoil.....	2.1	9.6	12.0	27.8	13.4	12.2	22.5



## PORTSMOUTH CLAY.

The Portsmouth clay occupies the same position as the Portsmouth sandy loam and is formed under the same conditions, except that the areas have no natural outlets. The drainage water sinks into the earth, leaving any fine material washed in on the surface. The soil, to a depth of 4 to 6 inches, is a dark, ashy-gray to dark bluish-gray soil ranging from a silty loam, soft and velvety to the touch, to rather stiff clay, and carrying a high content of partially decomposed organic matter. The subsoil is a stiff, plastic, tenacious clay of an ashy gray color—mottled with yellow, red, and brown. The mottling becomes more intense with increase in depth. Below 30 inches the content of sand increases. The clay subsoil of this type burns into a light-gray brick of good quality and has been used here for brick making to some extent. At present there are no kilns in the county.

In many areas the drainage water sinks away so slowly that artificial drainage is necessary for the establishment of proper conditions for cultivation. Like the Portsmouth sandy loam, this type is of low agricultural value when first drained, and it takes longer to bring it into profitable cultivation. For this reason the type is locally known as "dead" land. After draining and clearing it is well-nigh impossible to grow a profitable crop of any kind for several years. A few areas that have been in cultivation for several years are now producing good crops, and the soil is considered among the best in the county for crops like corn. A heavy application of lime would hasten the attainment of the healthful condition following reclamation by drainage. The infertility of the soil when first drained is doubtless due to acidity—a condition resulting from lack of aeration.

The Portsmouth clay is not a type of large extent, although there are areas of it scattered throughout that part of the county occupied by the Portsmouth series. Draining these soils is very important as a matter of hygiene if for no other reason. Thorough drainage, deep and thorough cultivation, and heavy applications of lime are the principal needs on this soil.

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

*Mechanical analyses of Portsmouth clay.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23429.....	Soil.....	0.6	7.3	8.1	17.3	8.5	18.1	40.1
23430.....	Subsoil.....	1.2	5.3	6.9	14.5	8.6	13.9	49.5

## PORTSMOUTH SAND.

To a depth of 6 to 8 inches the Portsmouth sand is a dark-gray to black, medium to rather coarse sand, usually having a loamy character on account of the high content of organic matter. The subsoil is a gray or light-gray to almost white, loose medium sand which at 25 to 30 inches is underlain by a stratum of ironstone gravel about 6 to 15 inches in thickness. This stratum is so dense and compact that in most places it is almost impossible to bore through it. Below this bed of gravel the material is a light-gray sticky sand or sandy clay mottled with yellow and brown.

The type occupies the same position as does the Portsmouth clay and the Portsmouth sandy loam, but is invariably surrounded by sands instead of sandy loams or clays. These areas have natural outlets, but are usually quite wet, so that more thorough drainage will be necessary before profitable crops can be grown. None of these areas have yet been cultivated. If thoroughly drained and given an application of lime, this type would doubtless produce good yields of crops requiring a rich, loose, moist soil, such as sugar cane, celery, and vegetables. At present the type is covered with a dense growth of pine, maple, and cypress, besides many plants and shrubs peculiar to wet situations.

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

*Mechanical analyses of Portsmouth sand.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23425.....	Soil.....	4.4	13.3	19.6	39.9	11.1	5.9	5.8
23426.....	Subsoil.....	2.2	12.0	19.6	42.0	12.0	4.9	6.8

## KALMIA SANDY LOAM.

The surface soil of this type is a dark-gray or ash-colored medium sandy loam to a depth of 8 to 12 inches. It is very uniform in color and contains considerable silt. The subsoil is a light-yellow heavy sandy clay mottled with light red at 20 to 36 inches. At 30 inches the color is lighter, being more nearly a light gray.

The type occupies flat second bottom areas along the Flint River. It is a very productive soil, having been made fertile by overflows of the river, which, occurring only about every six or seven years, and then usually in the winter season, seldom injure the crops.

It is considered the best corn soil in the county. Oats also do well, but rust has given some trouble. Cowpeas, rye, sugar cane (in the lower portions), sweet potatoes, and melons give satisfactory yields.

On account of the good water-holding power of the soil and the high content of organic matter and nitrates, all of which cause the plants to produce too much "weed," it is not well suited to cotton. The type does not require as heavy fertilization as do many other soils of the county, the addition of nitrates usually being unnecessary. Natural drainage is fairly good and crops rarely suffer from the effects of dry weather. The type is of small extent in this county.

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

*Mechanical analyses of Kalmia sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23394.....	Soil.....	3.6	13.3	11.6	24.2	11.8	26.8	9.0
23395.....	Subsoil.....	3.4	10.7	8.6	19.1	14.4	18.0	25.3

SUMTER STONY SANDY LOAM.

The surface soil of the Sumter stony sandy loam, to a depth of about 5 to 12 inches, is a yellowish-gray to yellow medium sandy loam. The surface is covered with weathered, yellowish limestone and chert fragments, which are in most places so abundant as to prevent or retard cultivation. These fragments contain fossils characteristic of the Vicksburg-Jackson formation. The subsoil usually consists of a mass mainly of chert and partially disintegrated limestone. The interstitial soil is more often a yellow sandy clay, though sometimes it has a reddish cast.

The type is found principally in the central part of the county, as narrow, irregular-shaped ridges or high, narrow stream divides. Frequently it lies on slopes where erosion and consequent exposure of the underlying limestone formation has resulted.

The type is at present little used for agricultural purposes because of its stony character, and much of it is covered with a forest growth of longleaf pine and oak. In a few places it has been cleared and the stones removed to admit of cultivation. Like most stony soils, the type is quite fertile and produces good yields of any crop grown. This soil is used to a small extent for growing peaches, and for this purpose it has been found profitable. Fruit trees growing on it show a vigor and thriftiness not found on other types in the area. The type might be more largely used for orchard purposes.

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

*Mechanical analyses of Sumter stony sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
23435.....	Soil.....	1.9	12.2	11.6	33.1	20.5	13.9	6.8
23436.....	Subsoil.....	1.2	7.9	10.0	25.9	16.6	16.3	21.6

MEADOW (OCKLOCKNEE MATERIAL).

Meadow (Ocklocknee material) includes the narrow strips of wet, soggy land along the smaller streams. It occupies the same relative position as the swamp lands of the larger streams. It has no distinct soil character, but varies from a pure sand to sticky plastic clay of varying colors, usually dark brown or some other dark color.

In places Meadow (Ocklocknee material) areas have resulted through the accumulation of seepage water that comes out from the slopes along the streams rather than from the streams themselves.

In some places the Meadow (Ocklocknee material) areas have been cleared of timber growth, and truck crops and sugar cane have been grown. The soil seems to be very well adapted to sugar cane, the quality of the sirup being very good. Celery would also likely do well on this soil.

SWAMP.

Along the Muckalee and some of the other large creeks and along the Flint River in some places is a broad belt of low, wet land, covered much of the time with water, which is mapped as Swamp. Isolated areas of Swamp of varying size are also found in other positions not adjacent to streams, as for instance "The Hundred Acre Pond," in the southeastern part of the county.

Swamp is of no present agricultural value. It furnishes some pasturage for hogs, but that is all. Portions are now fenced and used as range for hogs. The Swamp is heavily wooded with cypress, magnolia, maple, some pine on the slightly higher parts, water beech, and many water-loving shrubs, small plants, and vines. Some valuable cypress timber remains.

Swamp occupies the same position as the low strips of land along the smaller streams, but is usually wetter. It is not likely that this land will soon be brought into cultivation, principally for the reason that reclamation would be very difficult and expensive. After clearing it would be necessary to build dikes along the streams to prevent overflows in times of freshet.

## SUMMARY.

Sumter County has an intermediate position between the Piedmont Plateau and the Coastal Plain in South Georgia. Americus, the county seat, is 150 miles due south of Atlanta and about 185 miles west of Savannah.

The topography varies from quite rugged in the northern and northwestern parts to almost flat in the southeastern part. The general slope is to the southeast, and all the streams flow in this direction.

The stream flood plains are wooded, as are also all the low swampy areas, a feature which gives the county the appearance of being heavily wooded. There are many fine springs in the area, the most noted of which are Magnolia Springs, Myrtle Springs, and Sweet-water Mineral Spring.

Sumter County was formed from a part of Lee County in 1831, and named in honor of Gen. Thomas Sumter. The first inhabitants came from adjoining counties.

There are several large plantations here, some of which are 5,000 or 6,000 acres in extent.

Transportation is furnished by two railroads—the Seaboard Air Line and the Central of Georgia. Excellent wagon roads are now being built in all parts of the county.

The climate is ideal. The winters are not long or severe; the summers are warm and long, thus giving to all vegetation a long growing season. The rainfall is ample and well distributed throughout the year.

Agricultural practices vary from the poorest to the best. Farming in general is improving and land is advancing in price. Heretofore farmers have been depending too largely on commercial fertilizers and not using enough organic manures. This condition is changing, and while little stable manure is available the plowing under of green crops is given more attention.

Cotton is the leading crop. It is grown by every farmer on all kinds of land. The yield varies from one-third to 1 bale or more per acre. Corn is also generally grown. The yield is often very low on account of poorly selected soil and poor methods. The oat crop is a very important one and is increasing in acreage. Cowpeas are also important.

Trucking is not important in the area, although the soil, the climate, and the markets are all favorable to its development. Cantaloupes, watermelons, strawberries, and all the garden vegetables do well. The conditions are favorable for the growing of tobacco, but none is grown at the present time.

Some of the largest and finest peach orchards in the South are in Sumter County. The industry, however, is not being developed to



the extent it should. Many orchards of pecans are being set out, and the growing of this nut promises to become the most important special industry.

Farm tenure is much the same as in all other parts of the South. The tenant system prevails. Most of the tenants are negroes, who furnish one-half the fertilizer and receive one-half the crop. Farm wages range from \$12 to \$15 a month and board, and from 50 to 75 cents by the day.

The soils of Sumter County are derived from material washed down from the Piedmont Plateau in past geological ages and from a soft limestone which underlies all parts of the county at depths varying from a few inches to many feet. They range from the lightest sands to the heaviest clays. The soils in the northern part are for the most part light and sandy and adapted to crops requiring only a short season, such as oats, cowpeas, and truck. In the western part, near Plains, there are large areas of a heavy clay soil belonging to the Greenville series and adapted to such crops as cotton, corn, wheat, and perhaps alfalfa. Broad belts of deep sand are found along all the streams.

In the southern and southeastern parts are large areas of light-yellow soils well adapted to truck and other short-season crops, as well as to many of the general farm crops. These yellow soils belong to the Norfolk series. The black Portsmouth soils are wet and swampy and are not much cultivated.

The pebbly lands of the county belong to the Tifton and the Greenville series. They are among the best and highest priced lands and produce the best yields.

The Greenville loamy sand, though called a sand, is of higher value than most sands, as it has a retentive subsoil, usually within 15 to 25 inches of the surface, and produces good yields of many of the crops grown here. Corn does surprisingly well on this soil.

There are some stony areas in the county, due to ridges of chert that did not weather down with the limestone. They are mostly wooded and not cultivated, although well adapted to the growing of fruit.

The swampy areas, found along the larger streams and in some isolated sections, are utilized only for hog ranges.

On the whole, land is cheap, there being tracts that can be purchased and paid for with the crops of a few seasons.

The climate is healthful, and the general health of the community is excellent.

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