

## SOIL SURVEY OF COVINGTON COUNTY, ALABAMA.

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### DESCRIPTION OF THE AREA.

Covington County is situated in the south-central part of Alabama, along the Florida line. It is bounded on the west by Escambia and Conecuh Counties, on the north by Butler and Crenshaw Counties, on the east by Coffee and Geneva Counties, and on the south by Walton and Santa Rosa Counties, Fla. The county has an area of 1,044 square miles, or 668,160 acres.

The drainage of the county is discharged on the west, south, and east by way of the Conecuh, Yellow, Blackwater, and Pea River systems. The Conecuh River is the largest watercourse, but it does not drain as much local territory as the Yellow River. It heads in Bullock County and flows in a southwesterly direction through Crenshaw and Covington Counties, leaving Covington County on the west. It has cut a narrow channel from 10 to 60 feet below the adjacent bottoms. Even in seasons of unusual precipitation the river rarely leaves its banks. The Conecuh River system drains the northern, northwestern, and a portion of the central part of the county. The drainage is well developed and ramifications of the tributary streams extend to all parts of this section. The principal tributary streams are Patsaliga, Pigeon, Feagin, Big and Fall Creeks, of which Patsaliga and Pigeon Creeks are the most important.

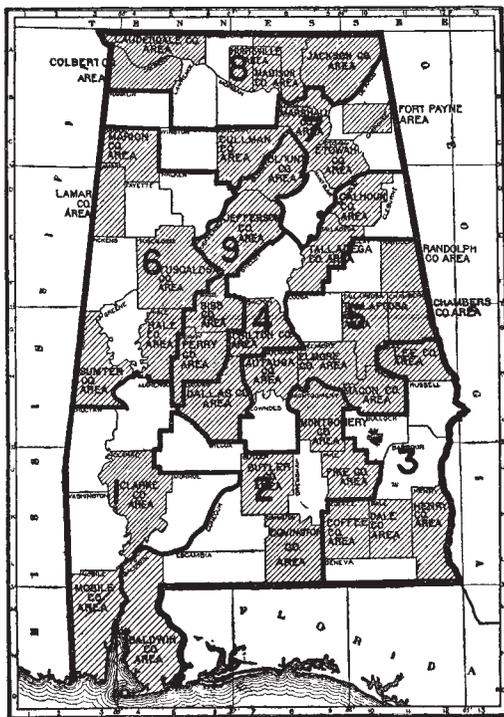


FIG. 18.—Sketch map showing areas surveyed in Alabama.

The Yellow River receives the drainage waters of the central and eastern parts of the county. It flows south and then southwest through the county, and receives the waters of Poley, Lightwood, Indian, Limestone, and Five Runs Creeks, and their branches, in addition to numerous small streams.

The Pea River system drains the eastern part of the county, the principal tributaries being Panther and Corner Creeks. The drainage of the southwestern corner of the county is discharged into Blackwater and Boggie Hollow Creeks and the East Fork of Blackwater River.

In addition to the watercourses mentioned, there are numerous sinks or depressions in the southern part of the county which drain local areas through subterranean channels in the St. Stephens limestone.

The topography of Covington County ranges from level in the bottom-land areas to gently rolling or rolling in the more elevated uplands. The uplands for the most part consist of broad, gently rolling ridges, which lie favorably for farming operations, but they become more rolling and broken near the stream courses and in the northern part of the county. The county, as a whole, slopes gradually toward the south and southeast. The uplands situated in the northern and central parts and to some extent those lying west of the Conecuh River are more elevated than elsewhere in the county. Probably the roughest and most broken part of the county lies between Conecuh River and Pigeon Creek. The country is also broken to some extent between the forks of the Yellow River. The streams have cut deep and narrow valleys and the approaches to watercourses are generally quite abrupt.

The noticeable variations in the surface configuration of the different parts of the county are largely due to or have been influenced to some extent by the underlying geological formations. The higher and more rolling uplands are developed in the northern end of the county, which is represented by the Woodsbluff and Hatchetigbee division of the Lignitic. These formations have withstood the forces of weathering more successfully than the formations in the central and southern parts of the county. Occurring in a wide belt across the central part is the Claiborne formation, and this section has rolling to undulating surface features. The southern end, which has the smoothest surface, embracing undulating and gently rolling areas, is underlain by the Grand Gulf formation.

East of Yellow River toward Coffee County and in the southwestern part of the county the country is more gently rolling and the streams are approached by more gradual descents. The southeastern part may be described as undulating or gently rolling. The streams are quite sluggish and are usually bordered by swamps or sloughs, while the local ridges are dotted by sinks and depressions.

The population of Covington County, as reported by the census of 1910, is 32,124. Andalusia, with a population of 2,480, is the county

seat and principal town. Florala, the next largest town, has a population of 2,439. Other important towns are Lockhart, Opp, Red Level, and Falco.

The original settlers in this region came from Georgia and the northern part of Alabama. The county is rather thinly settled, notwithstanding the fact that during the last few years a great many people from neighboring States have made it their home.

Churches and schoolhouses are conveniently located throughout the county, while the farmers enjoy the benefits of rural free delivery of mail and local and long-distance telephone service.

About 52 per cent of the county consists of cut-over pine lands, pine forests, and mixed forests (Pl. IX, fig. 1). The lumber and turpentine interests are at present much more important than agriculture. The forests are being rapidly removed, however, and large tracts of land await settlement.

The county has a well-developed system of public highways. Only a small percentage of the mileage of public roads is graded, but during this year (1912) much preparation has been made for the building of permanent roads. The roads in general are sandy and usually heavy during dry weather, but improve in wet seasons. In places where the clay is exposed the reverse is true. There are a great many third-class or settlement roads which will be converted into public highways as the county develops.

Covington County is traversed by the Louisville & Nashville Railroad, the Central of Georgia Railway, and the Florida, Alabama & Gulf Railroad.

#### CLIMATE.

The annual mean temperature of Covington County is 65° F., while the winter mean is 15° lower and the summer mean 15° higher. Since the southern part of the county is only about 40 miles from the coast, the climate is tempered both in winter and summer by the influence of the Gulf. The temperature seldom goes above 96° F. No matter how hot the day, a cooling breeze usually blows inland after sundown, reaching Florala between 9 and 10 o'clock and making the nights comfortable. Its effect is not felt so strongly at Andalusia.

The average date of the last killing frost in spring is March 13, and of the first in fall November 12, giving an average growing season of 244 days. The date of the earliest recorded killing frost in autumn is October 24 and of the latest in spring April 5.

The rainfall is abundant and well distributed, the annual mean precipitation at Evergreen being 51 inches. Summer is the wettest season, with an average of 18 inches of rain, and fall the driest, with 8.9 inches. There is always plenty of moisture for the growing crops, and, owing to the sandy nature of the soils, excessive rains seldom keep the farmers out of the fields more than a day after they cease. Crops on low, wet soils suffer more than those on the higher and

better drained land. Fogs sometimes form during warm spells in winter. Sleet and flurries of snow often follow rains from the northwest, north, and northeast, but most winter rains come from the east and southeast. During the summer the wind blows steadily from the southwest, occasionally bringing heavy thunderstorms.

In the fall "September gales" occur. These are cold, misty rains, accompanied by steady southeast winds of high velocity, often strong enough to up-root forest trees. Cyclones are almost unknown in Covington County.

Covington County has plenty of running water for stock. Water for domestic use is obtained from dug wells, which are from 15 to 75 feet deep. The water is good, clear, free from taint, and rather soft. Where land is underlain by the St. Stephens limestone the water is harder. Springs are few in number and usually occur at the foot of limestone bluffs in deep ravines cut by the watercourses in the northern part of the county.

The data given in the following table, showing the normal monthly, seasonal, and annual temperature and precipitation at Evergreen, located about 30 miles west of Andalusia, are representative of conditions in Covington County:

*Normal monthly, seasonal, and annual temperature and precipitation at Evergreen.*

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	<i>° F.</i>	<i>° F.</i>	<i>° F.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i> <i>T.</i>
December .....	50	77	13	3.4	4.9	3.0	
January .....	48	74	13	3.1	4.1	4.7	0.4
February .....	51	80	0	6.6	3.6	8.2	1.0
Winter .....	50			13.1	12.6	15.9	1.4
March .....	58	85	23	5.6	3.0	5.9	0.0
April .....	65	92	30	2.7	T.	3.2	0.0
May .....	72	96	42	2.7	0.6	4.0	0.0
Spring .....	65			11.0	3.6	13.1	0.0
June .....	78	100	54	6.4	4.2	8.5	0.0
July .....	81	105	59	6.4	10.5	8.8	0.0
August .....	80	100	59	5.2	1.5	3.4	0.0
Summer .....	80			18.0	16.2	20.7	0.0
September .....	76	100	40	3.0	0.1	1.4	0.0
October .....	65	90	30	2.2	2.4	3.4	0.0
November .....	56	85	22	3.7	4.0	2.8	0.0
Fall .....	66			8.9	6.5	7.6	0.0
Year .....	65	105	0	51.0	38.9	57.3	1.4

## AGRICULTURE.

Owing to its remoteness from main waterways and established settlements, the area embraced within Covington County was little more than a hunting ground for the Seminole and Creek Indians until after 1799, when Andrew Ellicott ran the line of the thirty-first parallel along its southern boundary. At that time the country was covered by a dense forest growth, including yellow pine, oak, bay, magnolia, cypress, black gum, etc. The Indians retained possession until they were removed, about 1838, although some white hunters and settlers had gradually drifted in before this time.

The county was formed December 18, 1821, from a part of Henry County, though its area has been reduced since that time. Montezuma, located on the Conecuh River, was the first county seat, but in 1840 the county government was moved 3 miles to the present site of Andalusia and no trace of the older settlement now remains. The northern part of the county, around Rosehill, was also settled early and comparatively thickly, but the southern and southwestern parts are still sparsely settled. The population of the county as a whole increased very slowly prior to the advent of the railroads and the county remained practically undeveloped for the first 80 years after its organization.

Although a large part of the land had been homesteaded before this, the agricultural development of the county may be said to date from the building of the Louisville & Nashville Railroad, about 1901. The county now became one of the most important turpentine and lumbering sections of the State and the removal of the forest opened up new lands for cultivation. Prior to that time its agricultural possibilities were not recognized and timbered lands were selling at \$3 or less an acre. The value of farm lands increased from \$682,990 in 1900 to \$3,263,394 in 1910.

Corn, oats, and potatoes were the principal crops in the early days. While there was some cotton grown, the difficulty experienced in getting it ginned and hauled to market kept the production at a minimum. Small quantities of rice, peas, wheat, peanuts, melons, tobacco and truck crops were grown, mostly for home use. Hogs and cattle of inferior grade and some sheep were raised.

A great many changes have been made in the farming practices during the last ten years. Little or no wheat is now grown. The planting of peas and beans in the corn, the growing of winter cover crops, and the rotation of crops are fast being adopted. Cotton has ceased to be a secondary crop and its acreage limited only by the capacity of the farmers to handle the land.

The census of 1900 shows that the yield of cotton was 5,969 bales, while that for 1910 shows a yield of 15,893 bales, or nearly three times as much. In 1880 only 1,158 bales were produced. The county is

credited with a production of about 82,000 bushels of corn in 1880, while in 1910 the yield was nearly 454,000 bushels. The total number of acres in farms in 1880 was 125,420 and the estimated value of all farm property was \$366,502. In 1910 there were 315,240 acres in farms and the value of all farm property was \$5,503,568.

Cotton is the principal crop and the main source of agricultural revenue in Covington County. It is grown to a greater or less extent on practically all of the soils, but finds its best development upon the sandy and fine sandy loams of the Norfolk, Orangeburg, Greenville, and Tifton series. The yields are usually low, except where heavily fertilized, when as much as a bale or more per acre is secured. On similar soils in various parts of the cotton belt from 1 to 2 bales per acre are obtained when the soils are liberally fertilized and properly cultivated, and when cowpeas or some other leguminous crop is grown occasionally, in order to supply the necessary vegetable matter to the soil. With the coming of the boll weevil early planting of early-maturing varieties, frequent cultivation, and intensive treatment generally have been necessary to make the production of this crop profitable.

Cotton is now grown mainly on ridges or beds thrown up usually over the center of the old rows without previous breaking of the land, and in such cases fertilizer is distributed along the bottom of the old rows on hard, weather-beaten land. It has been shown to be a much better practice to break and harrow the land, getting it in a fine mellow condition, and to apply about one-half to two-thirds of the fertilizer just before planting the seed and the remainder as a side dressing about the time of the second cultivation, and at about blooming time to add from 50 to 100 pounds of nitrate of soda as a top dressing. Deeper plowing and more thorough pulverization of the heavier soils are essential, in order to catch and hold the rainfall for the future moisture supply of the plants. On the sandy and well-drained lands, such as predominate in Covington County, the ridges of beds should be low and all cultivation should be toward that end. On the flat and poorly drained lands where surface drainage is inadequate the throwing up of the ridges is necessary in order to keep the plants sufficiently high to avoid the water table.

The recent organization of boys' corn clubs and the giving of prizes for the best yields have given a marked impetus to the growing of corn. The average yields of corn for the county are low, but yields of from 25 to 50 bushels can be obtained easily from many of the upland soils, and also from the sandy loams occurring on the second bottoms, when these are properly handled and when the crop follows legumes such as bur or crimson clover or cowpeas. In this case the corn does not require as much nitrogen in the fertilizer, but liberal applications of acid phosphâte and potash are beneficial.

The corn crop is grown on all soils in the county in practically the same way as the cotton. The planting is done either on ridges or in water furrows, the latter planting being below the general level of the land. This method allows the fine soil to be gradually worked to the corn, and the roots are sufficiently deep in the ground so as not to be broken by ordinary cultivation. The water-furrow method is not suitable for the poorly drained bottom lands. Shallow and frequent cultivation is necessary for the best results with this crop. Commercial fertilizers or manures are essential for large yields, especially on the more sandy soils. Some of the bottom lands when protected from overflows are better suited to the production of corn than the light upland soils and require less and, in some cases, no fertilization.

Peanuts are occasionally planted in the middle or between the rows of corn, and in many cases cowpeas are sown broadcast at the laying by of the corn. The practice of pulling fodder or stripping the leaves from the stocks is somewhat general in the county, but some of the more progressive farmers are discontinuing this practice.

Oats and rye are grown to a small extent, mainly for feed and grazing. There is no reason why profitable yields of these crops should not be obtained from the heavier types of the Greenville, Orangeburg, Tifton, and Norfolk series with comparatively light applications of commercial fertilizers and thorough preparation of the seed bed. The best results are secured from fall seeding—about October or the first of November. Most of the oats and rye are sown broadcast and plowed in or drilled closely. The oats when allowed to mature make excellent grain for stock and are ready to be fed in the sheaf at a time of the year when the grain supply is usually low. Both of these crops are valuable as a source of vegetable matter when plowed under and are excellent winter cover crops. Rye furnishes good pasturage for cattle during the winter and early spring.

The growing of peanuts on a commercial scale has received but little attention in this county. The fine sands and sandy loams of the Tifton and Norfolk series and the higher, better drained areas of the Kalmia are well suited to the production of this crop. They are grown in a small way between the rows of corn, require comparatively little cultivation and light applications of fertilizers, and afford an excellent crop for the hogs to pasture and fatten upon, as well as for market purposes.

These leguminous crops, especially cowpeas, are being grown to some extent throughout the county. They are admirably suited to most of the soils, and their production will surely be extended. Cowpeas and soy beans usually yield from 15 to 40 bushels of seed per acre.

Sugar cane is one of the minor crops. A considerable quantity of sirup of an excellent quality is made annually, but all of it is consumed within the limits of the county, and manufacture on an extensive scale has not been attempted. The Norfolk, Ruston, and Kalmia soils do not produce quite as heavy yields as the bottom lands and the Greenville and Orangeburg soils, but the sirup from the cane grown on the former types is superior, having a brighter color and a slightly better flavor than that obtained from the product of heavier and darker colored soils.

Sweet potatoes are produced for home use on nearly every farm, satisfactory yields being obtained on all the well-drained sandy soils, with liberal applications of manure or commercial fertilizers. Irish potatoes are grown only in small patches for home use. Their production could be increased and the crop marketed on a profitable and commercial basis. Other vegetables are grown successfully, and their production could be undertaken on a commercial scale where suitable soils lie convenient to shipping points.

Strawberries are grown in Conecuh County on a commercial scale, and there is no apparent reason why this crop can not be successfully grown in Covington County, which possesses almost identical soil and climatic conditions.

Pecans, figs, pears, peaches, and grapes are successfully grown in a small way. The pear trees are more or less subject to blight. So far as climatic and soil conditions are concerned, peaches can be grown on a commercial scale.

This soil survey shows that the county, with its wide range and large development of good soils, its warm and equable climate, and its low-priced lands, possesses great agricultural possibilities. At present a comparatively small extent of the good, arable land is devoted to agriculture—more than one-half of the area being still in forest or in the condition of "cut-over lands."

The soils of the county, as a rule, are low in organic matter, and it is recommended that leguminous crops be grown and the vines turned under in order to add vegetable matter and nitrogen. On account of the heavy rainfall, it is suggested that summer and winter cover crops be used to the fullest extent in order to prevent serious leaching and erosion. In this way many of the slopes, which are now unsightly and barren, could be converted into productive fields.

Large quantities of grain and hay are purchased outside of the county. These articles of feed for stock can be grown here without decreasing the output of cotton, which with proper methods of cultivation could be produced if necessary on a much smaller acreage.

The large mills and turpentine orchards employ large numbers of laborers, paying better wages than can be paid on the farm. As a result, most farmers have to depend on their own families and the

cooperation of neighbors for help. The putting of the fields in such shape that improved machinery may be used will help to relieve the situation to some extent. Considerable effort is being made to clear the fields of stumps with this end in view.

The average size of farms in Covington County is 94.6<sup>1</sup> acres. Nearly two-thirds of the farms are operated by the owners. The remainder are tenanted largely on shares. The usual rent is one-third of the corn and one-fourth of the cotton crop, where the renter furnishes his own teams and implements, but many owners prefer to furnish these and half of the fertilizers and get half of the crop. When leased for cash rent the usual consideration ranges from \$2 to \$5 an acre, depending on the location and nature of the land.

Large tracts of cut-over timberlands are coming on the market each year at prices ranging from \$3 to \$20 an acre where sold directly to farmers. Good land in fairly good locations may be bought for \$10 or \$12 an acre. Ten dollars an acre is usually considered a low estimate for clearing these lands and getting them in good working condition. It is probably more economical to buy cleared than uncleared land unless one has the time to put his own labor on it.

#### SOILS.

Covington County lies in the Gulf Coastal Plain section of the State. The soils of the county for the most part occupy very favorable topographic positions, being sufficiently rolling to give surface drainage and yet not steep enough to erode seriously. The friable character of both the soil and subsoil admits of free circulation of water and air. A large part of the land can be tilled with modern labor-saving farm machinery. There are very extensive undeveloped areas of excellent soils which when cleared and freed of stumps will be equally as productive as the soils which are now under cultivation. Owing to the wide range of soils and the favorable climatic conditions, a highly diversified system of agriculture could be developed.

The upland soils have been derived through the processes and agencies of weathering from Coastal Plain materials, consisting of beds of sand, sandy clays, and locally formed beds of heavy clays. These materials, having been transported by streams from higher lying lands, were laid down in marine or lacustrine waters. This sedimentary deposit was finally lifted above the water and was again subject to many modifying influences, such as those of rainfall, running water, vegetation, and oxidation. Through aeration and drainage oxidation has in many places influenced the chemical constituents, and as a result there are various colored soils ranging from yellow to bright red. Vegetation has had considerable effect in changing the color and structure of the surface soil. Erosion has played a great part in changing the general surface features by cutting

<sup>1</sup> Each tenancy is tabulated by the Census as a farm. The individual holding is larger than this figure.

stream channels, valleys, and gullies and by washing soil from higher to lower positions. The rain water in permeating the soil and subsoil and in finding its way over the surface to the well-established drainage ways has carried in suspension large quantities of the finer sediments, such as silt and clay, from the surface layer and deposited them at lower depths in the soil or transported them considerable distances. Small ferruginous concretions and quartz gravel or cherty gravel are quite conspicuous over a large part of the county.

Underlying these sands and sandy clays at various depths, and occasionally exposed in some of the deeper cuts, are various geological formations. The lignitic division, represented by the Woods Bluff and Hatchetigbee formations, are exposed in the northern end of the county, the Claiborne, including the Claiborne and Buhrstone, occupies wide strips through the central part, and the St. Stephens formation covers a wide strip in the southern part. These strata lie at a sufficient depth below the surface not to exert any influence upon the origin of the various types of soil. The Grand Gulf formation is seen in the southwestern part of the county, and this has perhaps played some part in the formation of the Norfolk and Tifton soils.<sup>1</sup>

The soils vary from sands through sandy loams, fine sandy loams, to loams and clays having good drainage, to wet and overflowed stream-bottom soils. There is sufficient difference in these soils as regards texture, color, topography, and crop adaptations to warrant many separations, and consequently the soils have been divided into a large number of individual types. These types have been combined or grouped together into series, the members of which have a common origin and similar characteristics of color and structure, but differ in texture.

The Norfolk series comprises types with light-gray surface soils and bright to pale-yellow sands or friable sandy clay subsoils. This series is represented by the Norfolk sand, Norfolk fine sand, Norfolk sandy loam, and Norfolk fine sandy loam.

The Orangeburg soils are characterized by gray to grayish-brown surface soils and bright-red, friable, sandy clay or sand subsoils. Drainage has been well established in practically all areas and oxidation has proceeded to an advanced stage. In this series have been mapped a sand, fine sand, sandy loam, and fine sandy loam. Plate IX, figure 2, shows the smooth topography of the best phase of the Orangeburg soils.

Soils of the Ruston series are characterized by gray to grayish-brown surface soils and reddish-yellow to yellowish-red friable sandy clay subsoils. This series occupies an intermediate position

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<sup>1</sup> For further discussion of the geology of this region see reports of the Alabama Geological Survey.

as regards the color of the subsoils between the Norfolk on the one hand and the Orangeburg on the other. The Ruston sandy loam and Ruston fine sandy loam are the only types of this series encountered in the county.

The Tifton soils resemble closely those of the Norfolk series in color and texture, but have as their distinguishing characteristic a considerable admixture of small rounded iron concretions. These occur on the surface and disseminated through both the soil and subsoil and have given such land the common appellation of "pimply land." The subsoil of the Tifton is of a deeper yellow color and firmer or slightly more compact than that of the Norfolk. The Tifton series is represented by a sandy loam and fine sandy loam.

The Greenville types have as their distinguishing features surface soils of a dark-brown to red color, and brick-red, friable sandy clay subsoils. In this series oxidation and aeration have proceeded to an advanced stage. Only two members of the Greenville series were encountered, the sandy loam and fine sandy loam.

The Susquehanna fine sandy loam and clay have been derived from the weathering of beds of heavy clay, and are characterized by the stiff, plastic structure and mottled color of their subsoils.

The Portsmouth fine sandy loam has been formed in practically the same way as the Norfolk, but its topography has favored the growth of vegetation and the decay of this for centuries has filled the soil with organic matter, thus giving it a dark-gray to black color. In addition, inadequate drainage has prevented aeration and oxidation, and as a result the subsoil is a yellow, mottled with gray or drab sandy clay.

The Plummer fine sandy loam consists of a gray surface soil and light-gray to whitish fine sandy loam subsoil, which in places becomes mottled with yellow or drab. It lies at the base of the slopes or in slight depressions and receives the drainage waters from higher lying lands, and consequently it is in a wet and saturated condition for the greater part of the year.

The alluvial areas occurring along the rivers and streams consist of material which has been brought down from the uplands and deposited at times of overflow. In many places there have been developed along the Yellow and Conecuh Rivers and Patsaliga Creek broad and rather continuous areas of second-bottom or high terraces, lying from 10 to 50 feet above the normal water level of the streams. These areas were built up when the streams flowed at much higher levels than at present and are now subject to overflow only at times of exceptionally high water. The soils of these terraces are light gray in the surface and have yellow, friable to rather compact subsoils. This material gives rise to the Kalmia sand, Kalmia fine sand, Kalmia sandy loam, and Kalmia fine sandy loam. The first bottoms along the smaller

creeks and, in some places, the larger streams and rivers which are subject to frequent overflow are being constantly built up by deposition from the streams. Such material has been classed as Ocklocknee loam, Swamp, and Meadow. The Swamp and Meadow, however, represent soil conditions rather than distinct soil types.

In many localities the soils merge or grade into one another in such a way that it was impossible to draw distinct boundary lines between them. Many of the types, also, include areas of associated types which are too small to be shown on a map of the scale of an inch to the mile. In using the soil map if such areas are not represented they can easily be recognized from the description of the individual types in the report. All the types mentioned in this chapter are described in considerable detail in subsequent pages.

The following table gives the names and actual and relative extent of the soil types encountered in Covington County:

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk fine sandy loam.....	80,960	12.1	Ocklocknee loam.....	14,912	2.2
Tifton fine sandy loam.....	78,400	11.7	Swamp.....	10,432	1.6
Norfolk sand.....	72,192	10.8	Orangeburg sand.....	10,368	1.6
Norfolk fine sand.....	60,544	9.1	Orangeburg fine sand.....	7,360	1.1
Tifton sandy loam.....	51,520	7.7	Susquehanna fine sandy loam.....	6,400	.9
Orangeburg sandy loam.....	49,088	7.3	Greenville fine sandy loam....	4,480	.7
Orangeburg fine sandy loam..	44,480	6.7	Kalmia sand.....	4,160	.6
Norfolk sandy loam.....	37,760	5.7	Portsmouth fine sandy loam..	3,072	.4
Greenville sandy loam.....	26,560	4.0	Kalmia sandy loam.....	1,920	.3
Kalmia fine sandy loam.....	23,168	3.5	Plummer fine sandy loam....	1,792	.3
Meadow.....	23,040	3.4	Susquehanna clay.....	1,600	.2
Ruston sandy loam.....	19,136	2.9			
Kalmia fine sand.....	17,792	2.7	Total.....	668,160	.....
Ruston fine sandy loam.....	17,024	2.5			

NORFOLK SAND.

The Norfolk sand consists of a gray or light-brown sand or loamy sand, from 4 to 6 inches deep, resting upon loose, incoherent, pale-yellow or yellowish-gray sand, which generally extends to a depth of 3 feet or more. In local areas a little small white chert or quartz gravel is scattered through the soil and subsoil.

This type is distributed in all parts of the county and occupies various topographic positions. Its most extensive developments occur south of Loango and south and southwest of Andalusia. Small detached areas are found throughout the county, but less frequently in the east and northeast sections. It is typically developed in areas bordering the bottoms of Conecuh River, Patsaliga, Pigeon, and Panther Creeks. Here it occupies the valley slopes adjoining the bottoms.

The Norfolk sand is an easy soil to work. It warms up early in the spring and crops mature sooner on it than on any other type in the county, but it is inclined to be droughty and crops frequently suffer in dry spells. Only a small proportion of this type is under cultivation, and it is largely covered with a growth of pine, oak, and hickory. Where cultivated it is used chiefly for the production of corn, cotton, and to a much more limited extent of garden truck. In parts of Florida a very fine grade of wrapper tobacco is grown on this type, although the yields are light. The yields of cotton range from one-fourth to one-third bale and of corn from 5 to 12 bushels to the acre. The type is a fine soil for the production of early truck crops, but generally conditions do not justify the extensive growing of these at the present time. The soil is rather light for corn and cotton.

Land of this type is valued at \$7 to \$18 an acre.

#### NORFOLK FINE SAND.

The soil of the Norfolk fine sand is a gray or grayish-brown fine sand or loamy sand, which varies in depth from 4 to 8 inches. The surface material grades into a pale-yellow or yellowish-gray fine sand which usually extends to a depth of 3 feet or more.

This type occurs mainly in a belt across the lower central part of the county, covering extensive unbroken areas along streams and reaching back into the ridges and divides. Very few areas lie north of the broken belt and in the south it is generally flanked by the Tifton soils.

This type is well drained, easy to cultivate and crops mature early on it, but not quite so early as on the Norfolk sand. It is slightly more compact and is more retentive of moisture, and crops do not suffer from drought to the same degree as on the Norfolk sand, nor is there as much replanting of cotton after late spring frosts.

The Norfolk fine sand is derived largely from the weathering of the Coastal Plain sands, and owing to their excellent drainage the accumulation of vegetable matter has been scant.

Only a small proportion of this type is under cultivation. It is largely covered with pine and oak forest. When cultivated it is used for the production of cotton, corn, and garden truck. The truck is usually limited to small patches around the houses. The yield of corn averages about 10 bushels and of cotton one-third bale to the acre. The acreage of corn is small compared with that of cotton. Some of the finest grades of cigar-wrapper tobacco are grown on this type, but the yields are light. All kinds of light garden truck do well on this soil, the yields being usually heavier than on the Norfolk sand, but markets and transportation facilities are not suitable at present for extensive development of truck growing. The Norfolk fine sand is rather light for the production of corn and cotton. The

organic supply has been largely depleted as the result of clean culture of these crops. It will be necessary to correct this deficiency before much improvement in the productiveness of the type can be made.

Land of this type ranges in value from \$7 to \$20 an acre.

#### NORFOLK SANDY LOAM.

The surface soil of the Norfolk sandy loam consists of a gray or grayish-brown sandy loam about 6 inches deep. Below this lies a pale-yellow loamy sand or light sandy loam. The subsoil, beginning anywhere between 12 and 20 inches, is a yellow sandy clay. In places in poorly drained areas mottlings of gray are seen, while in some of the better drained areas a reddish-yellow sandy clay subsoil is encountered.

Included with the Norfolk sandy loam are many small spots of Plummer sandy loam. These usually lie at the heads of branches, and are nearly always wet or poorly drained, owing to the accumulation of water seeping from the higher lands. These spots are too small to be shown on a map of the scale used in this survey. They are usually characterized by wet, spongy, sandy soil with immediate subsoil of white or whitish-gray sandy clay. Pitcher plant and sedges are characteristic plants.

With the exception just noted, the Norfolk sandy loam is quite uniform throughout its distribution, particularly in regard to texture of soil and subsoil, though there are slight variations in the depth of the surface soil.

The Norfolk sandy loam occupies the tops of ridges and divides and the surface features vary from level to gently rolling. It is most extensively developed in the central and northern parts of the county. Large areas are found in the vicinity of Gantt, Sanford, and Watson schools.

In general this type is well drained, easy to work, and withstands protracted spells of dry weather. Crops mature somewhat earlier on it than on the Norfolk fine sandy loam. A considerable proportion of this type is under cultivation, while the remaining areas are covered with longleaf pine, interspersed with hickory, oak, and dogwood.

Where cultivated corn and cotton are the principal crops, while sugar cane, oats, peanuts, sweet potatoes, cowpeas, and velvet beans are grown to a limited extent. The yield of cotton ordinarily ranges from one-third to one-half bale and of corn from 15 to 25 bushels to the acre, but with heavy fertilization a bale or more of cotton and a proportionately increased yield of corn are produced. Oats are grown for winter pasturage, and peanuts and a small quantity of sweet potatoes produced for home use, and occasionally a patch is planted for hog pasture. Sweet potatoes yield from 100 to 150

bushels per acre. Cowpeas are usually grown for hay, yielding from 1 to 1½ tons per acre. Velvet beans are often sown in corn.

In parts of Florida Sumatra wrapper tobacco does well on this type of soil. There the yields are much heavier than when the Norfolk sand or fine sand are used, and, although the quality is not quite so good, the increased yield makes the crop more profitable on the heavier type.

This type is not quite as productive as the Norfolk fine sandy loam, but where it is properly managed it gives much better yields than can be obtained on the sandier soils. The soil is deficient in organic matter as a result of continuous cultivation to corn and cotton.

Land of this type ranges in price from \$7 to \$25 an acre, depending largely upon the location with respect to markets and shipping points.

#### NORFOLK FINE SANDY LOAM.

The surface soil of the Norfolk fine sandy loam consists of a gray or dark-gray fine sandy loam or loamy sand which passes into a pale-yellow fine sandy loam or loamy sand at about 6 inches. The subsoil, beginning between 10 and 15 inches, is a yellow, friable sandy clay, which usually extends to 3 feet or more. Included in this type are small spots of Norfolk sandy loam and fine sand.

The Norfolk fine sandy loam is the predominating type in the central and western parts of the county, while a large but more or less interrupted belt extends across the county in the south-central part. Some of the largest areas occur between Sanford and Red Oak Church. It usually occupies low divides or interstream areas, and the surface features vary from level to gently rolling.

The Norfolk fine sandy loam has been derived from the weathering of the unconsolidated beds of sand and clay forming the Coastal Plains material. Its position has not favored the accumulation of any large quantity of vegetable matter, and as a result the soil and the subsurface stratum are light colored and contain only small quantities of humus.

Most of the type is included in what is known as the "Piney woods" country. Where it occupies the more level country the surface soil is darker in color and the run-off is not as rapid as in the more rolling soil, and the soil does not warm up so early in the spring. The forest growth on the level areas is principally pine, but the proportion of dogwood is greater than on rolling areas, while the undergrowth in some places is chiefly gallberry. In the more elevated rolling areas the proportion of dogwood is less and the undergrowth is mainly broom sedge and wire grass.

Only a small proportion of the Norfolk fine sandy loam is under cultivation, in spite of the fact that it is recognized as the best soil

of the Norfolk series for the production of corn and cotton. Much more of this type will be taken up as the county becomes more thickly settled. When cultivated it is used chiefly for the production of corn and cotton. The yields reported for cotton range from one-third to two-thirds bale and for corn from 20 to 40 bushels to the acre. Peanuts, cowpeas, small patches of sweet potatoes, and sugar cane were encountered on this type. The estimated yields of potatoes range from 150 to 300 bushels, and of sugar-cane sirup from 200 to 250 gallons to the acre. The yield of peanuts, cowpeas, and velvet beans is very heavy. In Florida this is the best soil for the production of Sumatra wrapper tobacco. It gives heavier yields than the Norfolk sandy loam and produces a better quality of leaf.

Land of this type is valued at \$10 to \$25 an acre.

#### ORANGEBURG SAND.

The Orangeburg sand consists of a gray to grayish-brown medium sand or loamy sand 6 to 8 inches deep, resting upon a light-red or reddish-yellow sand. The subsoil in places becomes slightly loamy in the lower portion of the 3-foot section and occasionally grades into a red sandy clay at a depth of about 30 inches. Spots of Orangeburg fine sand, too small to show separately on a map of the scale used in the survey, are included in this type.

With the exception of a few small areas near the Florida line, the greater proportion of this type is confined to the northern half of the county and particularly to the region between Andalusia and the Butler County line. A comparatively small area of the type is found in Covington County. It is usually developed in small, isolated areas, occupying the tops of ridges, divides, and knolls, and the surface features vary from level to gently rolling.

The Orangeburg sand is derived from the weathering of sandy strata in the coastal plain deposits. The type is generally uniform in respect to texture, but it varies somewhat as regards the depth to the underlying sandy clay, the variation being caused largely by the inclination of the surface. Where the area is exposed to slight wash the soil is likely to be transported to lower levels, and in such areas the sandy clay may be found at 24 inches below the surface. On the other hand, where the land is more level the surface sands are deeper and may extend below 3 feet.

This type is easy to work, and being slightly more loamy is more retentive of soil moisture and more productive than the Norfolk sand. Most of it is under cultivation. Where it is still covered with forest the trees consist largely of oak, hickory, and pine. Like the other soils of the county, the Orangeburg sand is used principally for the production of cotton and corn, although some garden truck, cowpeas, and oats are grown. The yields reported for cotton range from one-

third to one-half bale and for corn from 10 to 15 bushels to the acre. Sometimes velvet beans and cowpeas are sowed in the corn before the last cultivation. Vegetables are confined to garden patches, being grown for home use only. Oats are sowed for winter pasturage and cowpeas are cut and cured for hay. In general, however, corn and cotton are produced year after year on the same fields.

The Orangeburg sand is well adapted to the production of early truck crops and Sumatra wrapper tobacco. The continuous cropping of corn and cotton should be discontinued and the soil put under a system of management which will maintain the organic content and increase productiveness.

Land of this type brings from \$10 to \$20 an acre.

#### ORANGEBURG FINE SAND.

The soil of the Orangeburg fine sand consists of a gray fine sand from 6 to 8 inches deep, underlain by a light-red or reddish-yellow fine sand or loamy fine sand, which at depths usually below 3 feet passes into a brick-red sandy clay.

Although it occurs in small, isolated areas in all parts of the county, the total area of this soil is small. It usually occupies country of level to gently rolling topography. Like the other soils of the series, it is derived from the weathering of unconsolidated deposits of the Coastal Plain. The type is generally uniform in texture throughout its distribution, but in local spots the friable sandy clay comes within 24 inches of the surface.

Nearly all of the Orangeburg fine sand is under cultivation. Forested areas support a growth composed mainly of longleaf and shortleaf pine, with some oak and hickory. Wild vetch is conspicuous among the smaller plants. Where cultivated the type is used chiefly for cotton and corn. The yields of cotton range from one-fourth to one-half bale and of corn from 12 to 20 bushels to the acre. In parts of Florida, Alabama, and Texas this type is a valuable soil for the production of Cuban cigar filler and wrapper tobacco. It is also adapted to the production of early truck crops, although they do not mature quite so early as on the Norfolk sand. It is a good peach soil.

This type brings from \$8 to \$20 an acre.

#### ORANGEBURG SANDY LOAM.

The surface soil of the Orangeburg sandy loam consists of a gray or light-brown sandy loam or loamy sand, which passes into a reddish sandy loam at about 6 to 8 inches. The subsoil is a red or brick-red friable, sandy clay, extending to a depth of 3 feet or more. Through the soil and more prominently in the subsoil occur brown or reddish-brown iron concretions, and in places ledges of iron crusts appear on the surface.

This type has a greater areal extent in this county than the Orangeburg sand. It is largely confined to the northern half. With the exception of a large area surrounding South, most of the type occurs in small, detached tracts. It has a gently rolling to rolling surface and excellent drainage.

Like the other soils of this series, it is derived from the weathering of the coastal sand and clay deposits lying where oxidation has reached an advanced stage. The type is generally uniform in texture throughout its distribution, although there is some variation in the proximity of the underlying clay to the surface. Local spots are not uncommon where the surface soil has been entirely removed by wash or erosion and the red sandy clay exposed. These areas would have been mapped as Greenville clay had they been large enough. Such areas usually occur on valley walls, hillsides, or around the heads of streams.

The Orangeburg sandy loam is one of the most important soils in the county for the production of general farm crops. It is easily cultivated, withstands protracted spells of dry weather, and responds well to proper treatment. The type is slightly more productive than the corresponding member of the Norfolk series. It is not, however, quite as productive of the staple crops as the Orangeburg fine sandy loam or the Greenville sandy loam.

The forest growth on this type consists largely of oak and hickory, with a scattering of longleaf and shortleaf pine. Nearly all of the land is now under cultivation and is used largely for corn and cotton, with cowpeas, sweet potatoes, and sugar cane crops of minor importance. Garden vegetables are produced for home use. The yields of cotton range from one-third to three-fourths bale and corn from 15 to 35 bushels to the acre. Sugar-cane sirup of splendid quality is made from the cane grown on this type. All kinds of garden vegetables do well, though they mature somewhat later than on the Norfolk sand or Orangeburg sand. This is a fine soil for peach growing.

In parts of Alabama, Florida, and Texas this is a desirable soil for growing the Cuban type of cigar-filler tobacco.

Crop yields are maintained on this soil chiefly by the use of commercial fertilizers. To aid in keeping the farms in a productive state, many farmers plant velvet beans or cowpeas in the corn before the last cultivation, and a few sow oats, rye, or bur clover as winter-cover crops. In general, crops can be economically produced, as the surface is favorable to the use of nearly all kinds of improved machinery.

Land of this type is valued at \$15 to \$30 an acre, depending upon location and improvements.

## ORANGEBURG FINE SANDY LOAM.

The soil of the Orangeburg fine sandy loam consists of a gray or light-brown fine sandy loam or loamy fine sand, which grades into a reddish-yellow or yellowish-red fine sandy loam at 5 to 8 inches. The subsoil in its typical development is a red friable fine sandy clay, which usually extends to 3 feet or more. Through the soil mass, but more particularly in the subsoil, is a scattering of small iron concretions, and not infrequently of thin iron crusts. This coarse material is generally more plentiful where the soil is thin. In local spots the underlying sandy clay is exposed at the surface, as a result of erosion. These areas would have been mapped as Greenville clay had their extent justified separation.

With the exception of the sandy loam the area occupied by this type is greater than that of any of the other Orangeburg soils. The type is largely restricted to the northern half of the county, although a few detached areas occur in the southern part. It occupies gently rolling to rolling country. The drainage is good. A considerable proportion of the type is under cultivation; the remainder is covered with forest consisting of oak, hickory, and pine. As on the other soils of this series, wild vetch is a conspicuous plant in the undergrowth.

The Orangeburg fine sandy loam is used chiefly for the production of cotton and corn. The yield of cotton ranges from one-half bale to a bale, and of corn from 20 to 35 bushels to the acre. Sweet potatoes, oats, rye, cowpeas, and peanuts are minor field crops. Sweet potatoes yield from 200 to 300 bushels an acre. Although there is no tobacco grown commercially on this type at present, it is a fine soil for Cuban seed-leaf tobacco. It is also well adapted to trucking and peach growing. Cowpeas, peanuts, and velvet beans are usually sown in the corn fields just before the last cultivation, while rye or oats, sometimes with hairy vetch or bur clover, are sown in the fall as winter cover crops and to supply pasturage.

This type is one of the strongest soils in the county for general farming. It responds readily to intelligent treatment, and the yields of the staples are easily maintained or increased by careful management. It is slightly more productive than the Orangeburg sandy loam, but not quite as good as the Greenville sandy loam and fine sandy loam. The soil is easy to work and well drained, and crops can be economically produced, as all kinds of improved machinery can be used.

Land of this type is held at \$15 to \$30 an acre, the price of improved areas depending primarily upon location.

## TIFTON SANDY LOAM.

The Tifton sandy loam is a gray or grayish-yellow sandy loam or loamy sand, underlain at about 4 to 6 inches by a yellow sandy loam. The subsoil in its typical development is a friable sandy clay, usually a little heavier than the sandy clay underlying the Norfolk sandy loam and of a yellow color, resembling that of cottonseed meal. Sometimes the change from the soil to the subsoil is more abrupt and a heavy, firmer, and more compact sandy clay is encountered within 15 inches of the surface. The substratum often consists of a mottled yellow, reddish, white and grayish, compact clay. Through the soil and subsoil occur many small iron concretions, which have given rise to the local appellation of "pimply land" for this and other members of the Tifton series. These concretions, the heavy character of the sandy clay of the subsoil, and its deeper color constitute the chief differences between this type and the Norfolk sandy loam.

The Tifton sandy loam is derived from the weathering of Coastal Plain materials. It has a general distribution in the eastern half of the county, although isolated areas occur in other parts. Practically all of the type has good drainage throughout.

This is an excellent soil for general farming. With fair tillage and the use of about 200 to 400 pounds of a mixture containing 8 per cent of phosphoric acid, 2 per cent of nitrogen, and 2 per cent of potash, the yields of cotton range from one-third to three-fourths bale and of corn from 20 to 50 bushels to the acre. The difference in yields is largely the result of the methods used in the cultivation of the crops. Where the crops are grown year after year on the same fields the yields decline, despite the increased quantity of fertilizer used. Where, however, the tillage is more thorough and crops are rotated so as to provide for winter cover and leguminous summer crops, the yields are easily maintained or increased.

Land of this type is held at \$8 to \$25 an acre.

## TIFTON FINE SANDY LOAM.

The surface soil of the Tifton fine sandy loam is a light-gray fine sandy loam, underlain at about 3 to 6 inches by a yellow fine sandy loam which extends to a depth of 8 to 15 inches. The subsoil is a deep yellow, friable sandy clay. As is the case with the Tifton sandy loam, the contact between the soil and subsoil in places is quite abrupt. The subsoil is firmer and slightly more compact than the subsoil of the Norfolk fine sandy loam. Occasionally it passes into yellowish-red or light-yellow to whitish clay within the 3-foot section.

Throughout the soil and subsoil occur the small, iron concretions characteristic of the Tifton series. On most of the knolls and on the



FIG. 1.—FOREST GROWTH OF LONGLEAF PINE AND DOGWOOD ON UPLANDS.



FIG. 2.—SHOWING THE SMOOTH TOPOGRAPHY OF THE BEST PHASE OF ORANGEBURG SOILS.



crests of ridges the quantity of these concretions is large. In the level to gently rolling areas the quantity is much smaller.

The Tifton fine sandy loam is extensively developed in the southern and southwestern parts of the county, although detached bodies occur in other parts. It occupies level to gently rolling country and is largely covered with a forest of longleaf pine.

Only a small proportion of the type is under cultivation, and this is used chiefly for the production of cotton and corn, although patches of peanuts, sugar cane, sweet potatoes, rye, oats, bur clover, and vetch were seen. The yield of cotton ranges from one-half to three-fourths bale and of corn from 25 to 60 bushels to the acre. The land is slightly more productive for these crops than the Tifton sandy loam. The yield of sweet potatoes ranges from 200 to 250 bushels, and of sugarcane sirup from 150 to 200 gallons to the acre. The peanuts, cowpeas, and velvet beans are usually sown in the corn. Oats, rye, vetch, and bur clover are used as winter pasturage crops.

This is one of the strongest soils in the county for the general farm crops. The surface features are such that improved farm machinery can be economically used. The soil is easy to work and is generally well drained. It is naturally a stronger soil than the Norfolk fine sandy loam and does not require as frequent or as heavy applications of fertilizers to maintain yields, although it is not quite as productive as the Orangeburg or Greenville fine sandy loams. It is one of the extensive and important types of the county, though as yet largely undeveloped.

Land of this type is valued at \$10 to \$25 an acre, depending upon location and state of improvement.

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

*Mechanical analyses of Tifton fine sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
414239.....	Soil.....	1.2	10.6	13.6	28.5	14.6	23.2	7.7
414240.....	Subsoil.....	.6	8.2	10.8	23.4	16.6	18.5	21.6

GREENVILLE SANDY LOAM.

The soil of the Greenville sandy loam is a red or reddish-brown sandy loam or loamy sand passing at about 4 to 8 inches into a red, light sandy loam. The subsoil, beginning between 10 and 15 inches, is a dark-red, friable sandy clay. In local areas the subsoil material is somewhat spongy in character. The sand in the soil varies from fine to coarse and gives the soil a mellow structure. When it has

not been stirred for some time the color of the immediate surface bleaches out to a light brown or, more rarely, gray, but within an inch or two the typical dark color is encountered.

Local spots occur throughout the area of this type in which the surface sand is deeper than usual. These would have been mapped as Greenville loamy sand had they been of sufficient extent. Local bodies were also encountered in which the underlying sandy clay was exposed as the result of erosion. These areas are in reality Greenville clay, but too small to admit of separation.

Although restricted to scattered areas in the northern half of the county, this type covers a larger extent of territory than any of the other soils of the Greenville series. It occupies gently rolling to rolling country, most of which has a surface favorable to the use of improved machinery. The type has good natural drainage. Forested areas consist of longleaf and shortleaf pine, through which is a scattering of oak and hickory.

Most of the Greenville sandy loam is under cultivation. It is adapted to a wide range of crops, including corn, cotton, cowpeas, peanuts, velvet beans, garden truck, and fruits. Where the soil is shallow it should produce a good quality of Cuban seed-leaf tobacco for cigar fillers, while Cuban and Sumatra wrapper may be produced on the deeper soils. The yield of cotton ranges from one-half bale to a bale, and of corn from 25 to 60 bushels to the acre. Cowpeas, velvet beans, and peanuts are usually sown in the corn just before the last cultivation and used as pasturage after the corn has been gathered. The Greenville sandy loam is more productive than the Orangeburg sandy loam, but not quite as productive of corn and cotton as the Greenville fine sandy loam.

Where the covering of sand is shallow as the result of wash or erosion the soil should be broken deep and a good supply of organic matter added. The effectiveness of this treatment as a protection against the severe rains of winter and early spring could be materially increased by the growing of winter cover crops, such as rye, oats, bur clover, or vetch. Where the soil is deep the necessity for deep plowing is not so urgent, but the land should be improved by plowing under sod, grain stubble, and green manuring crops, such as rye, oats, barley, crimson clover, vetch, cowpeas, etc.

Land of this type is valued at \$15 to \$30 an acre, depending largely upon improvements and location.

#### GREENVILLE FINE SANDY LOAM.

The surface soil of the Greenville fine sandy loam consists of a dark-brown or reddish-brown fine sandy loam or loamy fine sand with a depth of about 4 to 6 inches, grading into a red fine sandy loam which extends to a depth of 10 to 15 inches. The subsoil is

a deep-red, friable, fine sandy clay extending to a depth of 3 feet or more. Included in this type are small spots of Greenville sandy loam and fine sand.

In distribution this type is limited to a few small areas in the northern and northeastern parts of the county. Like other members of the Greenville series, it is derived from the weathering of the sands and loams of the Lafayette formation.

The Greenville fine sandy loam occupies level to gently rolling country and is generally well drained. In local spots however, the underlying sandy clay has been exposed as the result of erosion. Such areas would have been mapped as Greenville clay had their extent warranted it.

Nearly all of the type is under cultivation. It is adapted to a wide range of crops, of which corn and cotton are the most important. Cotton yields from one-half bale to a bale and corn from 20 to 60 bushels per acre. It is the most productive soil in the county for general farm crops and ought to produce a good type of Cuban cigar-filler tobacco. Truck crops and fruits do unusually well, although the type is not quite so early as the other members of the series.

Land of this type is valued at \$20 to \$30 an acre.

#### RUSTON SANDY LOAM.

The surface soil of the Ruston sandy loam is a gray to grayish-brown loamy sand to light sandy loam, grading at about 6 inches into a reddish-yellow light sandy loam. The subsoil, beginning at a depth of 10 to 20 inches, is a reddish-yellow to yellowish-red friable sandy clay. Occasionally it is faintly mottled with shades of yellow and brown, and in places with gray. This type is differentiated from the Norfolk and Tifton series in having a somewhat redder subsoil and from the Orangeburg in being less red. In other words, it holds an intermediate position between the Norfolk and Tifton and Orangeburg series and might be considered as a phase of any sandy loam in these three series.

Most of the type occupies level to gently rolling country, but it is frequently encountered on steep slopes and the crests of ridges, such areas as a rule being too small to map.

The principal crops grown on this type are cotton, corn, and oats, fair to good yields being obtained. With an average application of 200 to 300 pounds of fertilizer yields of one-third to one-half bale of cotton or 12 to 30 bushels of corn per acre are secured. With heavier applications, particularly in those fields in which the organic supply has been kept up by the growing and turning under of leguminous crops, still heavier yields are secured. Oats do only fairly well unless seeded in the fall on lands properly supplied with organic matter.

Land of this type ranges in value from \$7.50 to \$25 an acre.

## RUSTON FINE SANDY LOAM.

The surface soil of the Ruston fine sandy loam consists of a gray or grayish-brown light fine sandy loam or loamy sand, underlain at about 5 inches by reddish fine sandy loam. The subsoil encountered between 8 and 12 inches is a friable sandy clay of yellowish-red or reddish-yellow color.

Like the Ruston sandy loam, this is an intermediate type between well-developed types characterized by red subsoils and types with yellow subsoils. In distribution this type is restricted to the southern part of the county, and here it occurs as a rule in small areas. Numerous spots too small to show on a map of the scale used are scattered throughout the uplands.

The forest growth on this type is largely longleaf pine, with a scattering of oak. Cotton and corn constitute the chief crops, although oats, cowpeas, and velvet beans are also grown to some extent. Cotton yields from one-third to three-fourths bale and corn from 15 to 40 bushels per acre. This yield of cotton is generally secured by the use of 200 to 300 pounds per acre of a mixture containing 10 per cent of phosphoric acid, 2 per cent of nitrogen, and 2 per cent of potash. Oats when grown are generally used for winter pasture. Cowpeas are cut for hay, yielding from 1½ to 3 tons to the acre.

Land of this type of soil brings from \$10 to \$30 an acre.

## PLUMMER FINE SANDY LOAM.

The Plummer fine sandy loam consists of a gray to dark-gray fine sandy loam from 8 to 15 inches deep, resting upon a white or whitish-gray light sandy clay, which gradually changes in color with depth to a mottled yellow and white. This is underlain by a sandy clay or clay, similar in many respects to the subsoil of the Susquehanna series, and mottled with red, yellow, brown, white, and blue. The most typical material usually occurs in the center of the bodies of the type, while the subsoil changes to mottled yellow or drab near the points of contact with other soils.

The Plummer fine sandy loam occupies flats or poorly drained depressions, which are confined largely to the southern part of the county. It commonly lies at the base of or on the lower slopes of the higher areas. It receives the seepage waters of adjoining uplands and remains in a saturated condition, and immediately after rains may be partly covered with water. In general the forest growth on this type consists of a scattering stand of shortleaf pine, with an occasional sweet gum or bay. The undergrowth consists of water sedge, pitcher plant, and gallberry.

None of the Plummer fine sandy loam is under cultivation at present. It is one of the poorer upland soils and will likely not be re-

claimed until the more productive and better soils, like the Orangeburg, Greenville, Ruston, and Norfolk types, are more extensively utilized.

#### SUSQUEHANNA FINE SANDY LOAM.

The surface soil of the Susquehanna fine sandy loam consists of a gray or light-brown fine sandy loam or light loamy fine sand from 5 to 12 inches deep. The subsoil is a rather heavy, plastic clay, of a red or reddish-yellow color, mottled with gray, which frequently extends to a depth of 3 feet or more, but which may be underlain at 2 to 3 feet by a whitish clay, mottled with red. In a few places the subsoil is quite friable and closely resembles the heavier subsoils of the Ruston or Greenville types. As a general rule the subsoil of the Susquehanna fine sandy loam in this county is not so heavy nor as plastic as that in the larger and more typically developed areas in other sections of the State. Included in this type, in the extreme northeastern corner of the county, are a few patches of Susquehanna sandy loam, too small to be represented upon a soil map of the scale used. The only difference between the surface soil of these spots and that of the typical areas is in the content of the coarser grades of sand, which is greater in the former than in the latter.

The Susquehanna fine sandy loam has only a small development in Covington County, the type occurring mainly in scattered patches. Only a few large areas are found, and these lie in the northern end of the county. They occupy gently rolling to rolling areas, and are especially well developed on the slopes and tops of narrow ridges where erosion has been quite active. The deeper surface soil is usually encountered on the more gently rolling slopes. The type possesses good surface drainage, but the impervious character of the subsoil prevents the free internal movement of moisture, and the more level areas remain wet and soggy for a considerable time after rains. Only a small proportion of this type is under cultivation, the remainder being covered with a growth of pine, hickory, oak, dogwood, and other hardwoods.

Cotton and corn are the principal crops, and the yields of these are low, except when the soil has been heavily fertilized or manured and properly cultivated. The soil is best suited to the production of grasses, corn, and cotton, while cowpeas, vetch, and oats will give fair returns where properly managed.

Land of this type is valued at \$8 to \$20 an acre.

#### SUSQUEHANNA CLAY.

The surface soil of the Susquehanna clay consists of a clay or fine sandy loam, with a maximum depth of 5 inches. The subsoil is a red plastic clay, mottled with gray or whitish plastic clay mottled with red, which usually extends to a depth of 3 feet. In many places

in the lower subsoil a white, laminated clay is encountered. The depth and texture of the surface soil is quite variable, as the clay may be on the surface or there may be a covering of fine sandy loam. In fully 50 per cent of the area of the type the former condition exists, while in a small part the surface soil is a mixture of the clay with the originally overlying sand or fine sand. In other places the sand or fine sand attains a depth of 5 inches. The clay as exposed is a red, reddish-yellow, or mottled red, yellow, white, purple, and brown joint clay. This type occupies knolls, slopes, and narrow ridges which have been eroded badly in places. The surface drainage is good.

Only a few small areas of the Susquehanna clay are found in the county. These lie in the northern half. Little of the land is under cultivation. Much of it supports a growth of longleaf pine and oak. The difficulty and expense of handling the soil has restricted its use. With deep plowing and the incorporation of organic matter it is fairly productive.

#### PORTSMOUTH FINE SANDY LOAM.

The surface soil of the Portsmouth fine sandy loam consists of a dark-gray or grayish-black fine sandy loam, 6 to 10 inches deep. The subsoil is gray and yellow or drab and yellow, mottled heavy fine sandy clay. The type contains a high percentage of organic matter which is in a partially decomposed stage.

Included with this type is a small area of heavier soil located within the corporate limits of the town of Florala. It occupies a depression, is poorly drained, and is covered with a growth of water-loving grasses. The soil consists of a dark-gray or black silty clay loam, underlain by a distinct layer of peat, 6 or 8 inches thick, which grades into silty loam or light silty clay.

The Portsmouth fine sandy loam occurs in a few small areas in the east-central part of the county and only a small proportion of it is under cultivation. It occupies level to depressed areas and is generally poorly drained, supporting a growth of gum, bay, shortleaf pine, cypress, and magnolia.

Where drainage is partially established it produces good crops of corn and cotton, but at present most of it has not been used for agriculture. With the development of good drainage this would be one of the best soils for corn and forage crops in the county.

Land of this type ranges in value from \$8 to \$20 an acre.

#### KALMIA SAND.

The surface soil of the Kalmia sand is a gray medium sand from 4 to 6 inches deep, resting on a gray or yellow sand of the same texture with a depth that usually extends to 3 feet or more.

Included in this type are small spots of *Kalmia* fine sand and *Kalmia* sandy loam.

Only a small area of this type is found in the county. It forms narrow strips in the second bottoms of the rivers and larger streams, and usually lies at elevations of 10 to 60 feet above mean water level. The surface features vary from level to gently rolling. The materials forming this soil were deposited by the streams during periods of floods when they flowed at higher levels than they do at present.

Most of this type is covered with a mixed growth of longleaf and shortleaf pine, oak, and hickory. Some of the early settlements were located on this type, and when first cleared the land is said to have been productive.

The soil is well drained, easy to cultivate, and crops mature early on it, but the yields of corn and cotton, for which it is chiefly used, are very light. Cotton ranges from one-fourth to one-third bale and corn from 10 to 15 bushels to the acre. It is slightly more productive of these crops than the Norfolk sand and crops do not suffer to the same extent during seasons of dry weather. It is best adapted to the production of early truck crops, but conditions at present do not warrant the extensive development of trucking. The type is generally deficient in organic matter and the yields of corn and cotton could be materially increased by supplying it.

Land of this type of soil may be had for \$8 to \$10 an acre.

#### KALMIA FINE SAND.

The *Kalmia* fine sand consists of a gray or dark-gray fine sand from 4 to 10 inches deep, resting upon a subsoil of light-gray or pale-yellow sand of the same texture.

This type is more extensively developed than the *Kalmia* sand. It occupies level to gently rolling second bottoms occurring in narrow bands along the rivers and larger streams. The areas lie from 10 to 60 feet above the present water level.

When first cleared this type is productive, but under the continuous production of cotton the yields rapidly decline. Little of it is now under cultivation and it is largely covered with a growth of longleaf and shortleaf pine, scrub oak, and hickory. The reported yields of cotton range from one-third to one-half bale and of corn from 15 to 30 bushels to the acre. The *Kalmia* fine sand is much more productive of these crops than the *Kalmia* sand, but not so productive as the *Kalmia* sandy loam or fine sandy loam. It is well drained and easy to work, and crops mature early on it, but not so soon as on the *Kalmia* sand. The *Kalmia* fine sand is a splendid soil for the growth of early truck crops, but, unless conditions change materially, it will probably be used for the pro-

duction of corn and cotton for some time to come. The yields of these crops can be greatly increased by the more frequent growing of leguminous crops and the incorporation of organic matter.

From \$8 to \$15 an acre is asked for land of this type of soil.

#### KALMIA SANDY LOAM.

The surface soil of the Kalmia sandy loam is a medium, gray or dark-gray sandy loam or loamy sand, grading into a pale-yellow light sandy loam or loamy sand at about 6 inches. The typical subsoil consists of a pale-yellow sandy clay, usually friable but generally firmer and tougher than the sandy clay subsoil of the Norfolk type. In general this type has better drainage than the Kalmia fine sandy loam, but local depressions occur throughout, which are usually wet and poorly drained. In these spots the soil is generally much darker in color, while the lower part of the subsoil is slightly mottled.

This type, like others of this series, is confined to the second bottoms of the rivers and larger streams. In places it is extensively developed in long, continuous belts. The surface is generally smooth with a slight slope toward the watercourses.

Only a very small proportion of the Kalmia sandy loam is under cultivation, the greater part of it being covered with a mixed growth of pine, scrub oak, hickory, poplar, live oak, gum, and gallberry bushes. Where cultivated it is used for the production of cotton and corn. The yields of cotton range from one-third to one-half bale and of corn from 20 to 40 bushels to the acre. This is a much more productive soil than the Kalmia sand or fine sand for corn and cotton, but crops do not mature so early. It is a good soil for sorghum, sugar cane, cowpeas, vetch, and oats.

Good drainage should be established in local spots. This could be cheaply done by opening ditches to neighboring watercourses.

Land of this type is valued at \$10 to \$20 an acre.

#### KALMIA FINE SANDY LOAM.

The surface soil of the Kalmia fine sandy loam is a gray or light-brown fine sandy loam or loamy sand, resting on a yellow fine sandy loam or loamy fine sand at about 5 to 8 inches. The subsoil, beginning at about 12 inches, is a pale-yellow fine sandy clay, which usually exceeds a depth of 3 feet. In places the subsoil is rather heavy, being a clay loam or clay with a noticeable content of fine sand particles. Included with this type is a small area of Leaf fine sandy loam near River Falls Bridge which is characterized by a subsoil of mottled gray and yellow clay streaked with red at lower depths. There are also a few small patches of Cahaba fine sandy loam which are characterized by red or reddish-yellow subsoils.

This type occupies considerable territory in the county, and like other members of the series is confined to the second bottoms. It usually occurs at a greater distance from watercourses than the sands of the series. The soil-forming materials were brought down and deposited by waters during periods of overflow before the channels of the streams had been cut to their present depth.

The topography of the type is level to gently undulating, being so flat in places that drainage is not well established, and water frequently remains on the surface for days after rains. In such places the soil is darker in color and the subsoil deeper and more or less mottled with gray or drab.

Only a small proportion of this type is under cultivation. A large part of it is covered with a mixed growth of longleaf and shortleaf pine, hickory, oak, and gum. In some sections the land is known as "gallberry flats."

The principal crops are corn and cotton, the former yielding from one-half to three-fourths bale and the latter from 25 to 45 bushels to the acre. Where well drained this is the best soil of the series for growing these crops. Occasional patches of peanuts, sweet potatoes, and sugar cane seen during the survey indicated good yields. Cowpeas and velvet beans, growing in the corn, also looked thrifty. Where this type is used year after year for corn and cotton the yields decline rapidly unless heavy applications of commercial fertilizers are applied annually.

This soil is admirably adapted to the production of grasses and leguminous forage crops.

Where the land is poorly drained, the crops are usually retarded in growth and subject to disease. Drainage of affected areas can readily be improved by constructing ditches leading to the neighboring streams.

Land of this type is valued at \$10 to \$20 an acre, depending upon location with respect to shipping points and markets, and the character of improvements.

#### OCKLOCKNEE LOAM.

The surface soil of the Ocklocknee loam consists of a dark-gray or brown loam or fine sandy loam varying in depth from 8 to 15 inches. The subsoil is prevailingly a fine sandy loam or sandy loam of a drab, gray, or grayish and yellowish-brown color. Both the soil and the subsoil vary greatly in texture and color. Included in this type are small areas of shallow fine to medium sand, spots of silt loam, and in a few low places, clay. The soil in the latter consists of a gray or brown silt loam or clay loam, underlain below 4 to 6 inches by mottled gray and yellow, tough, plastic clay, which usually extends to a depth of 3 feet or more.

The Ocklocknee loam occurs in long, narrow strips along many of the creeks and small streams throughout the county. It occupies the first bottoms and is subject to frequent and in many places heavy overflows. The material is of alluvial origin, having been washed from the several upland types into the streams and deposited by them at flood times. In the process of deposition the material has been more or less assorted by the currents, causing it to vary considerably in texture in different places.

Most of this type is covered with a growth of gum, cypress, bay, magnolia, and shortleaf pine. In many places an undergrowth of gallberry bushes is found. Only a few spots have been cleared, drained, and cultivated. Corn is the principal crop, producing from 15 to 40 bushels per acre. Crops are always in danger of injury by floods. With the establishment of good drainage, this soil would be extremely valuable for the production of corn, sugar cane, and grasses.

#### SWAMP.

Swamp in this county consists of low, wet, poorly drained forest lands. The soils include sand, clay, muck, and peat, the texture depending largely upon location with respect to watercourses. The sands or sand and clay are usually found near the streams, the muck and peat more remote from running water. Many of the inland areas, lying at the heads of streams or incipient drainage ways, are locally known as "bays" and, where they border the streams, as "swamp."

The forest growth varies somewhat in the different "bays," but in general black gum and bay are the principal trees, with some shortleaf pine (swamp pine) and cypress. Near running water sweet gum, cypress, water oak, magnolia, and pine are all found.

Swamp occupies a comparatively small area but is widely distributed through the county bordering many of the streams. It is subject to frequent overflows and the surface is rarely dry.

#### MEADOW.

Meadow, like Swamp, represents drainage conditions rather than a textural soil distinction. It includes low-lying areas of variable texture, poorly drained, but not continually in the water-logged state characteristic of Swamp. It occupies stream and branch bottoms adjacent to running water and is subject to frequent overflow. The texture of the surface soil ranges from sand and gravel to muck and clay. Some parts of these areas drain rapidly after the spring floods, and good crops of corn and sugar cane are obtained from them. The yield of corn ranges from 15 to 40 bushels per acre, and of sugar cane from 150 to 300 gallons of sirup per acre. Little success has been had with cotton, even on the best drained portions of Meadow. Much more of the land could be profitably utilized if it were properly drained.

## SUMMARY.

Covington County, Ala., is one of the southern tier of counties bordering the Florida line. It has an area of 1,044 square miles, or 668,160 acres.

The topography ranges from level or gently rolling in the stream bottoms and terraces to rolling in the uplands.

The drainage is discharged on the west, south, and east by way of the Conecuh, Yellow, Blackwater, and Pea Rivers, the Yellow River draining a larger area than any of the other streams.

The climate is warm temperate. The annual mean temperature is 65°, the summer mean being 15° higher and the winter mean 15° lower. The growing season has a length of about 244 days. The annual mean precipitation is 51 inches. The greatest precipitation occurs during June, July, and August, the mean for these months being 18 inches, while the fall months average 8.9 inches. The southern part of the county is only about 40 miles from the coast, and the climate is tempered both winter and summer by the influence of the Gulf breezes.

Covington County is one of the most important turpentine and lumbering counties in the State, and about 52 per cent of its area consists of cut-over lands.

According to the census of 1910, the population is 32,124, of which 5,781 are negroes.

Favorable climatic and topographic conditions, diversity of soils, and plentiful water supply make Covington County a most promising agricultural region.

Corn and cotton are now the principal crops, with oats, rye, sweet potatoes, Irish potatoes, cowpeas, velvet beans, peanuts, sugar cane, truck crops, and fruit of minor but growing importance.

Twenty-three soil types, excluding Meadow and Swamp, are found in the county. Eighteen of these are grouped in eight upland series, the Norfolk, Susquehanna, Ruston, Orangeburg, Tifton, Greenville, Portsmouth, and Plummer, and five in two bottom-land or alluvial series, viz, the Ocklocknee and Kalmia.

The Norfolk fine sandy loam is the most extensive type. Only a small proportion of it is under cultivation. It is recognized as one of the strongest types of the series for corn and cotton. When well drained it is adapted to a wide range of crops, particularly the legumes, medium truck crops, and cigar-wrapper tobacco. Land of this type may be purchased for \$10 to \$25 an acre.

The Norfolk sand and fine sand have a smaller area. They are not so well adapted to corn and cotton and the yields secured are relatively light, the fine sand producing the heavier crops of the two. Both of these types are well adapted to early truck crops. Land of these types is valued at \$7 to \$20 an acre.

The Norfolk sandy loam has about the same crop adaptation as the fine sandy loam. The yields of corn and cotton are not quite so heavy, but the crops mature earlier. The land ranges in value from \$10 to \$25 an acre.

The Greenville fine sandy loam is an inextensive type, but one of the best soils in the county for general farm crops. The price of this type of land ranges from \$15 to \$30 an acre.

The Greenville sandy loam occupies a much larger area than the type last named. It is adapted to a wide range of crops, among which are the legumes, various truck crops, fruits, and cigar-wrapper and filler tobacco. It is held at prices ranging from \$15 to \$30 an acre.

Only a small proportion of the Susquehanna clay is under cultivation, most of it being in longleaf and shortleaf pine forests. It is a very difficult soil to handle, though, when properly tilled, it is well adapted to the production of general farm crops.

The Susquehanna fine sandy loam is adapted to general farm crops. Corn, cotton, forage crops, and fruits all do well upon it. It is valued at \$8 to \$25 an acre.

The Orangeburg sand and fine sand are similar in crop adaptation. The fine sand produces slightly heavier crops, but does not mature them quite so early. These soils are both too light for the best results with corn and cotton. They are better adapted to light farming and are especially suited to the production of truck crops, fruit, and cigar-wrapper tobacco. Land of these types is held at \$8 to \$20 an acre.

The Orangeburg sandy loam is adapted to the production of general farm crops, such as corn, cotton, medium truck, fruit, and cigar-filler tobacco. Farm land may be bought for \$15 to \$30 an acre.

The Orangeburg fine sandy loam is adapted to the same crops as the sandy loam. The average yields of corn and cotton are slightly heavier than on the latter type but crops do not mature quite so early. The farmers throughout the county recognize this as one of the most productive soils. It is held at \$15 to \$30 an acre.

The Plummer series is represented by the fine sandy loam. None of this type is under cultivation and it has no agricultural value at present, on account of its poorly drained condition.

The Tifton fine sandy loam has a wide distribution and is considered one of the best soils in the county for general farm crops, but only a small proportion of it is under cultivation. It is valued at \$10 to \$25 an acre.

The Tifton sandy loam is adapted to the production of medium truck, fruit, and general farm crops. It is slightly more productive than the Norfolk sandy loam. Land of this type is valued at \$8 to \$25 an acre.

The Portsmouth series is represented by the Portsmouth fine sandy loam, with which was included some Portsmouth silty clay loam. Drainage is not well established on this type and it has little agricultural value at present.

Two types of the Ruston series were encountered, the sandy loam and fine sandy loam. These types are adapted to general farm crops, the fine sandy loam being the more productive of the two. Land of these types is valued at \$7 to \$25 an acre.

The Kalmia sand and fine sand are adapted to the production of early truck crops. The sand matures crops earlier, but yields are not quite so heavy as on the fine sand. These soils are valued at \$8 to \$15 an acre.

The Kalmia sandy loam and fine sandy loam are adapted to general farm crops, particularly forage crops. The fine sandy loam is the more productive when well drained. Farms of these soils are valued at \$10 to \$20 an acre.

The Ocklocknee series is represented by the loam. Only a small proportion of this type is under cultivation, on account of poor drainage, but when drainage is established it produces heavy crops of corn, cane, and forage crops.

Nearly all the soils of Covington County are of a sandy character and the chief means of improvement consists in the maintenance of a good supply of organic matter and the practice of a system of crop rotation, including the frequent growing of leguminous forage and winter cover crops.

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