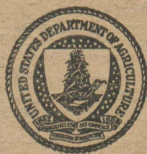


UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Survey
of
Greene County, Mississippi

By
J. W. MOON, in Charge
and
S. RANKIN BACON



Bureau of Chemistry and Soils

In cooperation with the
Mississippi Geological Survey

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SOIL SURVEY OF GREENE COUNTY, MISSISSIPPI

By J. W. MOON, in Charge, and S. RANKIN BACON

COUNTY SURVEYED

Greene County is in the southeastern part of Mississippi. The southern boundary is about 45 miles from the Gulf of Mexico, and the eastern boundary follows the Alabama State line (fig. 1). Leakesville, the county seat, is about 50 miles northwest of Mobile, Ala. The county is rectangular in outline, with dimensions of 24 miles east and west and 30 miles north and south. The land area is 710 square miles, or 454,400 acres.

This county lies entirely within the longleaf pine section of the sand and clay belt of the State. It occupies a thoroughly and, in part, a rather deeply dissected plain, and only small scattered remnants of the original level land, comprising probably less than 3 percent of the area of the county, are left intact. The larger bodies of the comparatively high tableland are in the southeastern corner, south of Mount Pisgah Church and along the George County line in the vicinity of Highland Farms. Remnants of comparatively old high benches, some of which are only slightly lower than the highest plains, occur here and there in most parts of the county. The principal and least dissected of these, locally known as "Pine Level", is a few miles west of Leakesville. Remnants of the high benches occur in a more or less regular series of levels, separated from each other by gentle slopes, and the difference in elevation ranges from 30 to 50 feet.

From 65 to 70 percent of the land ranges from rolling to hilly, and the rest consists of smooth plains. The comparatively deep channels cut across the county by Chickasawhay and Leaf Rivers have greatly hastened the process of erosion. An intricate dendritic stream pattern has developed, resulting in a land form characterized, in most places, by V-shaped valleys and narrow sharp ridges. An exception to this type of relief occurs in the northeastern corner of the county, where drainage has not cut so deep into a more resistant substratum, and the valleys are broader.

The more hilly and broken areas, such as the Jane Hills west of Chickasawhay River and about 6 miles north of Leakesville, the

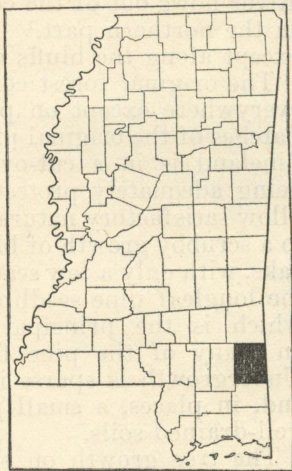


FIGURE 1.—Sketch map showing location of Greene County, Miss.

Sandy Creek Hills east of the river and about 6 miles south of Leakesville, and the Skull Creek Hills a few miles west of Neely, occupy bluffs immediately overlooking the larger stream valleys.

About 30 percent of the county consists of alluvial or stream-constructed plains, and about 50 percent of these are subject to stream flooding. Plains about 4 miles wide and 40 miles long constitute the valleys of Leaf and Chickasawhay Rivers, and less extensive plains are developed along the larger tributaries, such as Big Creek and Atkinson Creek.

Practically all the drainage is collected by the Leaf and Chickasawhay River systems, and it reaches the Gulf of Mexico through Pascagoula River.

The general slope of the land is from north to south, and the average elevation is probably between 150 and 175 feet above sea level. Differences in altitude range from about 55 feet where Leaf River flows out of the county to more than 275 at the higher points in the northern part.¹ Local differences in elevation are not great except along the bluffs overlooking the larger stream valleys.

The original forest consisted largely of longleaf pine which grew everywhere except on poorly drained land. Only a few scattered patches of the original pine forest remain, and nearly all the longleaf pineland is in a cut-over condition. Only a small percentage is being adequately protected against "pine-rooter" hogs and fire to allow satisfactory natural reproduction, and most of it is growing up to a scrubby growth of blackjack, red, black, post, and upland willow oaks, with only a few scattered pines. The work of hogs in uprooting the longleaf pine seedlings results in a domination of loblolly pine, which is the principal tree of the young second-growth forest on many of the pine flats on terraces along the larger streams. Undergrowth is sparse in most places, although wire grass, sedges, and, in places, a small proportion of carpet grass are common on well-drained soils.

The tree growth on the poorly drained land consists mainly of gum, ironwood, swamp maple, some spruce pine, and the water-loving species of oaks. In swampy places cypress and gum are dominant. Bay, running briers, and vines are conspicuous plants of the muck swamps along small streams.

Greene County was organized December 9, 1811. Most of the original settlers came from the Carolinas, with a smaller number from Georgia and Virginia. The population, all classed as rural, has shown a steady increase from 3,194 in 1880 to 10,644 in 1930. The county school records of the number of white and colored pupils indicate that the whites outnumber the Negroes 2 to 1. The whites are principally of English, Scotch, and Irish descent. There are practically no foreign-born residents.

Most of the homes are grouped in villages and along the better highways, leaving a number of interroad areas very sparsely settled. Distribution of the population has been influenced both by the lumber industry and by soil conditions, but the influence of the

¹ Data on elevation were obtained from the U. S. Coast and Geodetic Survey and from the Gulf, Mobile & Northern and the Mississippi & Alabama Railroads.

lumber industry is diminishing and that of soil conditions is increasing. People are naturally attracted by the better roads which are more economically constructed on the nearly level agricultural soils, and in this way soil conditions exert an indirect, as well as a direct, influence on the distribution of the population. The central-eastern part of the county is sparsely settled. It is evident that the rolling and eroded condition of the land and the sandy droughty character of the dominant soils in this section cause the sparse population. In part of the southwestern corner of the county where "gumbo hills" (Susquehanna soils) dominate, the population is also sparse.

Leakesville, with a population of 662, is the county seat and largest town. The villages of McLain in the western part, State Line at the northeastern corner (partly in Wayne County), and Avera and Piave in the northern part afford trading and shipping points for their respective vicinities.

The county is served by the Gulf, Mobile & Northern, the Mississippi & Alabama, and the Mobile & Ohio Railroads. These, together with one branch line, connect all the above-mentioned villages and afford shipping connections with the large cities of the East and Middle West. In addition to two graveled State highways, the county maintains a system of roads reaching all sections. Very few of the farm homes have telephones, but all sections are served either by rural or star mail routes. There is an excellent system of modern consolidated schools, to which transportation of pupils is provided at public expense.

Lumbering and turpentine have been the principal industries during the last several decades, but, owing to the depletion of the pine forests and the slow progress of reforestation, these industries are rapidly giving way to agriculture which is, and promises to continue to be, the principal industry.

CLIMATE

Climatic conditions prevailing in Greene County are characterized by long warm summers, short pleasant winters, heavy well-distributed rainfall, high rate of evaporation, and a high percentage of possible sunshine.

Proximity to the Gulf of Mexico affects the climate through amelioration of the temperature and an increase in rainfall. For this reason the rainfall is probably slightly heavier in the southern part of the county. Another slight local variation in climate is observed in the occurrence of frost in the river valleys at times when the uplands escape.

That the temperature of -5° F., recorded at the Weather Bureau station at Leakesville in 1899, is extremely unusual, is attested by the fact that no other reading below 11° was recorded at any time during that decade. The high temperature of 109° is almost as unusual. The winter climate here is little different from that along the Gulf coast, which attracts winter resorters. The warm summer nights are materially tempered by Gulf breezes. Outdoor occupations are carried on throughout the year, and considerable farm work is done during January and February.

Snow and severe freezes are rare, although killing frosts and short periods of damp chilly weather happen at frequent intervals throughout the winter. The usual weather cycle during the winter is rain followed by a few cool days which are followed by a period of pleasant, warm, balmy days and then by another rain.

The heavy average annual rainfall of 61.91 inches is well distributed throughout the year, averaging less during the fall months while the crops are ripening and being harvested. Electrical storms, especially in summer, and heavy downpours of rain are common. The wind velocity is usually low, and destructive winds and hailstorms are rather unusual. Although crop yields are sometimes materially reduced by extremely low or high amounts of rainfall, complete failures due to these causes are unknown. Droughts cause the greatest crop injury on sandy soils, whereas wet periods reduce the yields more particularly on the more level heavy soils.

The average length of the frost-free season is 241 days, from March 13, the average date of the latest frost, to November 9, the average date of the earliest. Frost has been recorded as late as April 12 and as early as October 21.

The climate is very favorable to a widely diversified type of agriculture, as the long frost-free season of about 8 months, ample rainfall, and mild winters allow the growing of a number of crops during all seasons of the year, and two or more crops or combinations of crops may be successfully grown on the same land in one season. Either corn, peanuts, sorghum, potatoes, hay, or peas may be grown following a crop of small grain. Any of these, and even cotton, or a number of truck crops may be seeded after a crop of Austrian winter peas or winter cabbage has been harvested. With a carefully planned system three crops of vegetables can be grown during the same year on the same land.

Wild-grass pastures can be grazed for an average of 9 months a year, and good sods of carpet and Bermuda grasses, together with white clover and lespedeza, may be expected to afford good grazing throughout the year when the winters are mild. With the use of oats, rye, wheat, clovers, winter field peas, or rape during the winter, grazing can be had throughout the entire year under normal conditions.

The climate favors winter growing of such field crops as oats, rye, and other small grains; vetch, winter field peas, including the Austrian and Gray Winter varieties; and such vegetables as cabbage, collards, onions, radishes, turnips, and lettuce. Less hardy vegetables, as peas, beans, and potatoes, are planted the last of February with little danger of being killed by frost. Roses normally bloom profusely until after December 1 and resume blooming in March. Japonicas, violets, narcissus, and hyacinths bloom in early February, and wild azalea and dogwood are conspicuous among the woods flowers in March.

Table 1 gives the normal monthly, seasonal, and annual precipitation and temperature, as compiled from records of the United States Weather Bureau station at Leakesville.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Leaksville, Greene County, Miss.*

[Elevation, 105 feet]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1924)	Total amount for the wettest year (1900)
	°F.	°F.	°F.	Inches	Inches	Inches
December.....	51.1	83	11	5.64	5.86	8.76
January.....	51.0	83	9	4.99	7.32	5.31
February.....	52.4	86	-5	5.89	5.21	12.12
Winter.....	51.5	86	-5	16.52	18.39	26.19
March.....	60.3	91	21	6.15	1.98	5.50
April.....	66.4	95	29	4.93	2.42	8.09
May.....	73.4	100	39	5.03	4.21	3.84
Spring.....	66.7	100	21	16.11	8.61	17.43
June.....	79.6	104	50	5.71	7.14	15.58
July.....	81.2	109	58	7.54	1.72	6.83
August.....	81.4	103	58	5.38	2.82	4.89
Summer.....	80.7	109	50	18.63	11.68	27.30
September.....	78.1	102	37	4.49	2.55	5.92
October.....	67.7	100	27	2.98	.42	3.60
November.....	57.9	89	20	3.18	.09	1.84
Fall.....	67.9	102	20	10.65	3.06	11.36
Year.....	66.7	109	-5	61.91	41.74	82.28

AGRICULTURE ²

The early history of agriculture in Greene County is typical of that characterizing this part of the South. More than 125 years ago a few white families had established permanent homes in the valleys of Chickasawhay and Leaf Rivers. The primitive agriculture prevailing here at that time was typical of American pioneer farming in that it consisted primarily in the growing of subsistence crops. Timber was first cut out along the larger streams, owing to the fact that rafting down the rivers was the only means of transporting it to market. The earliest farms naturally followed these clearings. Corn was the principal crop, and rice, sweetpotatoes, and the common garden vegetables were also grown. The abundance of oak mast on the first-bottom land and pine seed on the second bottoms and uplands made hog ranging profitable. At that time switch cane was much more abundant than at present, and ranging sheep and cattle on the river flats was common and profitable. Mobile, Ala., afforded a market for livestock, as well as a source of supply for the simple necessities which the pioneers could not produce on their farms. Cash income was derived principally from the sale of livestock and lumber, with cotton added to the list long before the Civil War. These products have furnished the principal sources of cash income during the entire history of the county, although a number of changes have been effected in the system of agriculture.

² Much of the information embodied in this section was furnished by D. C. Ashley, agricultural agent for Greene County.

The most significant changes in the acreages devoted to the various important field crops are the rapid increases of land in cotton and hay. During the last few years much interest has been shown in growing snap beans for canneries and garden peas and sweetpotatoes for the early spring market. To less extent the growing of tomatoes for market has recently been attempted. The corn crop has held first place as regards acreage throughout the history of the county. The steady increase in acreage devoted to this crop has just about kept pace with the increase in population. The acreage in oats has shown a rather general decrease. Wheat has never been grown to a great extent, and the growing of rice has been discontinued.

The census reports indicate an increase in value of all agricultural products from \$324,793 in 1909 to \$965,872 in 1929, or nearly 300 per cent. A part of this increase is due, however, to the higher prevailing price level of agricultural products in 1929. Some of the more significant changes in source of agricultural income, as indicated by the last three census reports, are an increase in value of animals sold and slaughtered from \$39,509 to \$412,761, and of vegetables from \$42,480 to \$108,026. The values of cereals, poultry, and eggs have proportionally increased. Dairy products, excluding those for home use, represent the only class of agricultural products actually showing a decrease. Income from the lumber and turpentine industries was at a peak during the World War and immediately following, but it has fallen off very abruptly during the last few years. The principal changes in fruit growing during the last 30 years have been a rather rapid decrease in the number of apple trees and an increase in the number of pecan and pear trees and in the acreage devoted to strawberries.

The industrial history of the county is just now entering an abrupt change. The rich harvest of original longleaf pine has practically been completed. Natural reforestation has been prevented by range hogs and fires, and a comparatively small amount of pine is now suitable for turpentine production, so that these industries, owing to the denetion of the forests, have abruptly dropped to a relatively subordinate place. Agriculture is the logical immediate recourse, and a drive is now on for the expansion of this industry.

Table 2 gives the acreage devoted to the principal crops in the years 1879, 1889, 1899, 1909, 1919, and 1929.

TABLE 2.—*Acreage of the principal crops in Greene County, Miss., in stated years*

Crop	1879	1889	1899	1909	1919	1929
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Corn.....	3, 563	5, 270	6, 271	4, 772	6, 772	9, 548
Cotton.....	35	322	254	897	1, 175	5, 133
Hay and forage.....	12	89	260	360	629	1, 426
Sweetpotatoes.....	477	479	621	539	639	814
Sugarcane.....	50	106	38	180	254	243

The principal field crops are corn, cotton, hay, and sugarcane, and the important vegetables grown in part for market are snap beans, garden peas, and sweetpotatoes.

Plowing for most crops is done in January and February, but plowing for garden peas is usually done in the fall. The usual

method of preparing the seed bed for all crops consists of flat breaking the fields, which is followed by laying out rows by listing or bedding. Cotton and truck crops are seeded on the bed, and corn and sugarcane are planted between the beds in the water furrow. The methods of cultivation employed are typical of the southeastern part of the United States. Very few riding cultivators are in use. The more common farm implements consist of one-horse harrows and sweeps. Methods of cultivation are essentially the same for all crops, except that much hand hoeing is necessary in "chopping", or thinning, cotton to a proper stand.

Popular varieties of corn are Hastings Prolific and the native Big-Cob; of cotton, D. P. and L. 4-8; of garden peas, Thomas Laxton and World Record; of sweetpotatoes, Porto Rico and Nancy Hall; and of sugarcane, P. O. J. 213. The approximate dates of seeding are as follows: For corn and sugarcane March 1, cotton March 20, sweetpotatoes April 1, peas any time in December, and snap beans the latter part of February.

Commercial fertilizer is applied to more than 90 percent of the acreage of these crops. Probably one-half of the fertilizer consists of a home mixture of equal quantities, by weight, of 18-percent superphosphate and cottonseed meal. Most of this is applied at the rate of 300 pounds an acre under corn at the time of planting. Many farmers follow this with a side dressing ranging from 50 to 75 pounds of nitrate of soda, when the corn is beginning to tassel. Most of the fertilizer used on land for cotton, beans, peas, and sweetpotatoes consists of a factory mixture of the formula 4-8-4.³ The common acre rate of application is 400 pounds for cotton and 1,000 pounds for vegetables. The materials in the ready-mixed fertilizers are superphosphate, muriate of potash, and about equal quantities of nitrate of soda and cottonseed meal. About 50 percent of the fertilizer used is purchased through the local farm bureau and the rest from local merchants. The total quantity used has shown a consistently rapid increase in value from \$2,098 to \$59,718 during the last 50 years, although the proportion of farms using it has remained around 80 percent during the last three decades. Agriculture here has not as yet advanced to the stage where any generally concerted effort is being made to adjust fertilizers to soil types, and the mixtures and quantities mentioned are in common use, irrespective of soil conditions.

The hay crops consist mainly of cowpeas, velvetbeans, soybeans, sorghum, and Mexican clover (*Richardia scabra*), locally referred to as "native clover" or "John weed", but which is not a true clover and belongs to the same family as povertyweed. The common custom is to interplant velvetbeans or soybeans with corn. Before frost, but after the ears of corn have been harvested, the stalks and beans, together with the Mexican clover, which grows as a volunteer crop after cultivation has been completed, are cut and harvested as hay. Cowpeas, which on many farms are mixed with either soybeans or sorghum, are seeded broadcast in June. The present tendency is to grow more hay, and soybeans are rapidly gaining in popularity as a hay crop.

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

Corn, hay, and the various garden vegetables, including a part of the snap beans, garden peas, and sweetpotatoes, and sugarcane sirup are consumed locally, although a small proportion of the corn and hay crops are redistributed through local merchants.

The cash income crops, other than lumber and livestock, are cotton, snap beans, garden peas, sweetpotatoes, and some sirup. Cotton is ginned at Leakesville, Piave, and State Line, and it is trucked to the Mobile market where about 50 percent is sold through cotton associations. Most of the cottonseed is either sold or exchanged for cottonseed meal. The snap beans are trucked out of the county to canneries at Lucedale, Laurel, and Bucatunna. Sweetpotatoes and garden peas are marketed, through local organizations, in early spring in St. Louis and other middle-western cities.

Small quantities of pecans and pears are available for market. Some are sold locally, but the greater part is sent through small personal shipments to markets farther north. Surplus strawberries are sufficient to supply strictly local demands, with only an occasional truckload for outside markets.

The livestock raised are largely cattle, swine, and sheep, and only a very few goats. These animals are raised mainly for home use, and there is also a considerable surplus for market. The animals are run on the open range, for the most part, except in the better farming communities where more nutritious grazing is supplemented with more or less dry and concentrated feeds. The general tendency throughout the county is to improve the grade of livestock. Most of the range cattle are scrubby grade animals, but they include some good grade Jerseys, and a number of excellent Hereford and Jersey bulls have been imported.

Poland China, Duroc-Jersey, and Hampshire hogs have been crossed with the native animals, but in general the grade level is not high. Most of the hogs have access to the open range and they are seen occasionally near the edges of the extensive swampy lands in a wild or semiwild state.

Sheep live almost entirely on the open range. Wool is shipped usually to Biloxi or Mobile, and most of the sheep, like cattle and swine, are sold to transient livestock buyers and trucked to Mobile or Hattiesburg.

Sale of dairy products is limited to the small demands of local villages. No specialty is made of poultry raising or dairying, but most farmers have a small number of poultry and eggs to offer local merchants and transient buyers.

Although practically all the original longleaf pine, the most valuable timber of the county, has been harvested, a few wood lots of this species remain, and considerable low-land hardwood grows in the swampy land. At present (1932) the county receives a fairly large cash income from this source, although it is small compared with that of even 10 years ago.

Economic conditions now prevailing, together with the recent abrupt decrease in lumbering activities, has precipitated abnormal local labor conditions, and there is a surplus of available farm labor. Wages are unusually low, about 75 cents a day, or from \$10 to \$15 a month. Normally, wages range from \$1.25 to \$1.50 a day and from \$25 to \$30 a month. The laborers are native-born whites and

Negroes, and they compare favorably with the usual run of laborers throughout southeastern United States. According to the United States census, the amount expended annually for farm labor has increased from \$3,530 to \$23,800 during the last 30 years.

During the last 50 years the number of farms has gradually increased from 358 to 955, and there has been a corresponding decrease in average size from 265 to 108 acres. During this time the proportion of the county in farms has fluctuated, with no general trend of increase or decrease, between 18 and 26 percent. Likewise the proportion of improved land in farms has shown no definite trend, but has ranged between the extremes of 7 and 21 percent during the last 50 years. According to records of the county tax assessor, a little less than 3 percent of the land is now under actual cultivation, and only a small proportion is in the process of clearing and being broken for agriculture. Most of the new land being broken is in the vicinity of Piave where the only large sawmill still running is about to exhaust its supply of timber. According to the tax assessor, 10 individuals own practically half the land in the county, in tracts ranging from 10,000 to 25,000 acres, but only a few farms of more than 100 acres are in actual cultivation. Most of the farmers use only one mule. More than 300 farm applications for Government loans, passing through the agricultural agent's office, indicate that the extent of cultivated land averages about 12 acres on each one-mule farm.

During a period of 40 years prior to the report of the 1920 census the proportion of farms operated by owners ranged from 92 to 96 percent. The 1930 census, however, indicates a decrease to 80.5 percent operated by owners. In the same year 19.3 percent of the farms were operated by tenants and 0.2 percent by managers. Practically all rented land is leased to share croppers. The renter (cropper) furnishes the labor and one-half of the commercial fertilizer and receives one-half of the farm produce.

Farm homes range from the most modern to those of the pioneer type, a large number of the latter being rather inexpensive structures. Owing to the warm climate and to the fact that the livestock are kept most of the time ranging on the cut-over lands and lowlands along the larger streams, the farmers as a whole have invested a comparatively small amount of money in outbuildings. Some fencing has been done in parts where an open-range type of farming is in vogue, either to enclose entire plantations or cultivated fields. In neighborhoods where the best soils dominate and a more highly developed type of agriculture prevails, pasture fences have been constructed.

Mules are the principal work animals, but very few are raised in the county, most of them being imported from States farther north. Only a few steers are used on the farms for work other than for hauling lumber. The agricultural soils have sufficient sand intermixed with the silt or clay materials to prevent surface packing and to preserve the plow soil in a good state of tilth. Partly for this reason deep plowing and heavy farm implements are not so essential as they might otherwise be. In addition the loose character of the surface soil discourages the use of tractors, so that these and other modern heavy farm implements are not common.

The average total investment per farm increased from \$1,006 in 1900 to \$3,452 in 1920, but decreased to \$2,498 in 1930. Of this amount 46.5 percent represents the value of the land, 29.1 percent the value of the buildings, 6.2 percent the value of machinery and implements, and 18.2 percent the value of domestic animals. The census indicates a steady increase in the acre value of farm land from \$2.15 in 1900 to \$11.15 in 1920, when the price level was at its peak, but it decreased to \$10.74 in 1930.

Under prevailing natural and economic conditions, the immediate paramount problem of agriculture in this county is proper utilization of the land. The fact that only about 20 percent of the soils are adapted to the growing of common field crops should not be interpreted as implying that the remaining 80 percent are useless. About one-fourth of the soils not suited to the growing of field crops are well adapted to carpet grass. Those soils too wet for carpet grass are excellent producers of timber. The rest of the soils unsuited to cropping would produce longleaf pine without labor or expense if forest fires were properly controlled, hogs removed from the open range, and seed trees provided. The thinning of the tree growth by removing useless species and the eradication of wild grasses and weeds by heavy grazing on the moist lowlands are all that is necessary in most places to establish a splendid carpet-grass sod. General interest and concerted action are necessary to such a program, which when established, would materially increase the potential wealth and income of the county.

The cultivation of a rather large acreage of submarginal, or non-agricultural, soils is now being attempted. The failure of such efforts, under present economic conditions, is apparent. On the other hand, an equal, or even greater acreage of the best farming soils has never been broken and put into cultivation. The obviously proper adjustment necessary to correct this unfortunate use of soils should be effected as early as possible, before sheer necessity forces adjustment.

As agriculture in this county is, for the most part, of comparatively recent origin, it has depended largely on virgin fertility of the soils, assisted by commercial fertilizers during the last few decades. As brought out in the section on Soils and Crops, even the virgin fertility of soils in this area was low, and natural conditions favor rapid processes of soil deterioration. Certainly one of the fundamental problems of crop production is that of soil preservation. The heavy use of complete commercial fertilizer emphasizes the fact that, as both experience and investigation have indicated, the agricultural soils of this county are low in organic matter and mineral elements of fertility. As organic matter serves the purposes of supplying plant nutrients and improving the physical and biological conditions of the soil, the use of compost and leguminous manurial crops is highly recommended.

About four-fifths of the agricultural soils are susceptible to rapid erosion when poorly managed. Only a few farms have been terraced, but farmers generally are manifesting more concern. Terracing and commercial fertilizers are good and indispensable to a permanent scheme of agriculture in this area, but they are not sufficient in themselves to maintain the soils in a state of permanent

productivity. These two measures of conservation should be supplemented by a proper rotation of crops including as many leguminous winter and summer cover crops as is consistent with a feasible or efficient cropping scheme. It is also highly advisable to incorporate as much organic matter in the soil as efficient management will allow. Adequate terracing should prevent severe gulying, but cover crops are necessary to control sheet erosion. The shade afforded by the summer cover crop is thought to retard the processes of evaporation and of burning the organic matter in the surface soil. The scheme of crop rotation must necessarily vary according to many different conditions, not only between different farms, but also from year to year on the same farm. Crop rotation is regarded very lightly on many farms, but most of the more progressive farmers use the following or a similar rotation: Cotton or one of the truck crops, the first year; corn with interplanted velvetbeans or soybeans the second year; and a hay crop of cowpeas, soybeans, or velvetbeans the third year.

SOILS AND CROPS ⁴

The soils of Greene County differ widely in color, texture, consistence, fertility, and moisture conditions, all of which characteristics bear a relationship to productivity and crop adaptation. They exhibit all shades of color from dark gray through the lighter shades of gray to red. They range in texture and consistence from tenacious clay loams to loose incoherent sands, but the loamy sands and sandy loams are most extensive, covering nearly 70 percent of the area of the county, and the total areas of sands, of silt loams, and of clay loams are relatively small. About 75 percent of the soils are well drained or excessively drained, and natural drainage of the rest is inadequate for cultivation, some areas being continually saturated or subject to periodic overflow. Based on the standard of the southeastern part of the State, 5 percent of the county consists of productive agricultural soils adapted to the cultivated crops generally grown in the area, an additional 15 percent may be considered fair, and the remaining 80 percent is best adapted, under normal economic conditions, to the production of grass and timber.

The well-drained soils, having developed in an environment of forest cover, high average temperature, and heavy rainfall, are naturally poor in organic matter. The admixture of sand with the finer materials of the surface soil assures favorable physical tillage conditions.

The physical characteristics of these soils render them very susceptible to erosion when cultivated. The heavy rainfall and the downpours in which it sometimes occurs, serve to intensify this destructive process. The relief, or lay of the land, is therefore an important factor in the consideration of a soil from the point of view of either permanent productivity or utilization. The land forms range from a plain to areas of denuded broken hilly waste land. It is estimated that about 60 percent of the land is rolling, 10 percent hilly, and 30 percent nearly level.

⁴ Greene County adjoins George County on the south, and in some places the soil maps of these counties do not appear to agree. This is owing, in most places, to changes in correlation resulting from a fuller understanding of the soils of Mississippi. For instance, the Cuthbert and Biakely soils mapped in Greene County were not recognized at the time George County was surveyed.

In classifying the soils a number of soil characteristics, or features, were considered. In any one county or area, however, some of these characteristics bear a closer relationship to the cropping value or adaptability of the soil than do others. The soil features which are most significant agriculturally here are drainage conditions; texture, or proportions of sand, silt, and clay constituting the surface soil material; consistence, or degree of tightness, stickiness, or toughness of the subsoil; surface relief; and degree of susceptibility to erosion. For the purpose of discussion of their relative productivity and adaptation, or relationship to agriculture, the soils are grouped on the basis of these features.

Although the soils may be separated on a basis of fundamental characteristics, in regard to their utilization, they may be considered in two major groups—agricultural soils and forestry and range soils. As the names of the groups imply, the agricultural soils include those soils which possess the characteristics fundamentally necessary to satisfactory production of the common field crops of this section, and the forestry and range soils include all the land thought to be more profitably devoted to the production of timber and to grazing than to cultivated crops under normal economic conditions.

The agriculture practiced is typically that of the recently cut-over country of this general region. The virgin forest, heretofore the principal source of cash income, is now practically exhausted, and agriculture is becoming relatively more important.

Two types of agriculture prevail. One, here called general farming, consists of producing feed and food for farm needs, a small number of livestock, and some cash-income crops, principally cotton, supplemented by less important truck crops, such as snap beans, sweetpotatoes, and garden peas. This type of farming is restricted to a small part of the county where the better types of agricultural soils predominate. There are four fairly large sections of such soils—one on Pine Level, one at Highland Farms, one immediately south of Mount Pisgah School, and the fourth in the vicinity of State Line—and there are a few scattered smaller areas. The comparatively advanced state of agriculture in these communities is purely an expression of soil conditions.

The second type of farming revolves around open-range production of livestock, principally cattle and hogs, with varying numbers of sheep. The crops consist mainly of feedstuffs and the production of home supplies, and there is usually a small surplus of vegetables for market. Such a type of farming predominates in the valleys of both Leaf and Chickasawhay Rivers and is carried on to less extent along some of the larger tributaries, such as Big Creek and Atkinson Creek. This type of agriculture likewise results from the natural features of the land, chief of which are the soil conditions. These river lowlands average about 4 miles in width and follow Leaf and Chickasawhay Rivers a distance of more than 40 miles through the county. About 20 percent of the land is adapted to growing crops, more particularly feed crops, and the remainder affords good range grazing. With few exceptions the slopes flanking these valleys are severely eroded, rough, broken, and uninhabited, and they serve as both range land and barriers separating the range country from the general-farming communities on the tablelands.

Although all the general-farming type of agriculture is restricted to the better soils, it does not follow that this type of agriculture occupies all the better soils. Farming is, nevertheless, now being attempted on a rather large acreage of the poorer lands. Several factors have been instrumental in bringing about this condition, and lack of information on the part of the settler is not a complete explanation. During the last 20 years—the active stage of lumbering in the county's industrial history—many homes were constructed along the highways in the vicinities of the large mills, with little or no consideration of soil conditions, as the builder located, not to farm, but to work in the lumber industry. Since lumbering has ceased, he is now farming his submarginal, or forestry and range lands, rather than abandon his home. Other farmers homesteaded public land, practically all of which is better suited to forestry or open range. The greater part of the land now farmed along the larger streams is agriculturally inferior to a rather large aggregate of soils remaining in the virgin cut-over condition. Reluctance on the part of descendants to forsake the old settlements of their ancestral pioneers and the splendid environment for raising open-range livestock encourage the continuance of farming on these river plantations. Extensive landholdings and a refusal on the part of the owners to sell small tracts at reasonable prices seem to account for the present uncleared acreage of good agricultural soils.

In the following pages the different soils are described in detail, and their agricultural relationships are discussed; their location and distribution are shown on the accompanying soil map; and their acreage and proportionate extent are given in table 3.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Greene County, Miss.*

Type of soil	Acres	Per-cent	Type of soil	Acres	Per-cent
Red Bay fine sandy loam.....	4, 224	0.9	Norfolk loamy sand.....	14, 272	3.1
Orangeburg fine sandy loam.....	1, 728	.4	Norfolk sand.....	2, 944	.6
Blakely loam.....	192	.1	Kalmia sand.....	7, 872	1.7
Ruston fine sandy loam.....	3, 264	.7	Rough broken land.....	35, 328	7.8
Ruston loamy sand.....	4, 096	.9	Susquehanna fine sandy loam.....	22, 080	4.9
Marlboro fine sandy loam.....	3, 200	.7	Cuthbert fine sandy loam.....	79, 168	17.4
Norfolk fine sandy loam.....	24, 832	5.5	Leaf fine sandy loam.....	12, 800	2.8
Norfolk sandy loam, deep phase.....	6, 016	1.3	Leaf fine sandy loam, better drained phase.....	8, 576	1.9
Ruston fine sandy loam, rolling phase.....	15, 872	3.5	Myatt very fine sandy loam.....	14, 848	3.3
Orangeburg fine sandy loam, slope phase.....	1, 344	.3	Plummer loamy fine sand.....	6, 784	1.5
Red Bay fine sandy loam, slope phase.....	1, 856	.4	Dunbar fine sandy loam.....	832	.2
Kalmia fine sandy loam.....	26, 880	5.9	Grady very fine sandy loam.....	192	.1
Kalmia loamy fine sand.....	5, 824	1.3	Ochlockonee silty clay loam.....	6, 784	1.5
Cahaba fine sandy loam.....	3, 840	.8	Ochlockonee fine sandy loam.....	3, 904	.9
Cahaba loamy fine sand.....	2, 176	.5	Bibb silty clay loam.....	18, 752	4.1
Ruston loamy sand, rolling phase.....	24, 128	5.3	Swamp.....	36, 160	7.9
Ruston sandy loam, deep phase.....	21, 056	4.6	Muck.....	32, 576	7.2
			Total.....	454, 400	-----

AGRICULTURAL SOILS

The agricultural soils are here so grouped and named because each soil included in the group embodies the soil characteristics essential to the successful production of the common field crops in this section. That is, all members of the group are characterized by ade-

quate natural drainage; their subsoils are free from toughness, extreme plasticity, and cementation; and they contain sufficient proportions of silt and clay or fine materials to retain an adequate supply of moisture for the support of satisfactory crop growth. Erosion has been comparatively slight, and these soils occupy land forms which are nearly level or gently sloping, where measures of protection against gullyng may be maintained at nominal expense.

The principal soils conforming to these requirements are the sandy loams and fine sandy loams of the Red Bay, Orangeburg, Ruston, Marlboro, Norfolk, Kalmia, and Cahaba series, and Blakely loam.

These soils occupy about 20 percent of the area of the county and occur in bodies ranging in size from less than 1 to several square miles. One of the larger bodies lies in the extreme southeastern corner, another just west of Leakesville, a third immediately southeast of Neely, and several are in the vicinity and south of State Line. Smaller areas are mapped near Avera and scattered promiscuously in other parts, and others occur on the better drained hammocks here and there along the edges of the Leaf and Chickasawhay River Valleys.

These soils are practically stone free, and most cultivated fields are clear of stumps. Owing to the absence of steep slopes and to the presence of a comparatively high proportion of sandy materials in the surface soil, good tilth and easy working conditions are characteristic.

Judged by the standard of well-drained forested soils of this section, these soils are comparatively high in natural fertility or content of available plant nutrients. Nevertheless, as compared with soils developed in an environment of grass cover and moderately low temperature and rainfall, the plant nutrients of these soils have been rather severely leached out. Consequently, under normal economic conditions, investments in commercial fertilizers prove profitable, and farmers ordinarily make rather heavy acre applications—400 pounds of a 4-8-4 mixture to cotton and 1,000 pounds of the same mixture to truck crops. A home mixture of 300 pounds of equal quantities of 18 percent superphosphate (acid phosphate) and cottonseed meal is ordinarily used under corn at the date of planting, and 75 pounds of nitrate of soda is used later as a side dressing.

These fertilizer mixtures and quantities for the various crops are commonly used and will therefore be referred to in the discussion of individual soils in this report as the usual quantities and mixtures of fertilizers.

Although these soils have a number of characteristics in common, they differ from each other in one or more ways, as each soil mapped possesses its individuality. Also, the degree to which even the common characteristics are developed differs among the different agricultural soils. For these reasons the agricultural soils are divided into three subgroups, the members of which are more closely related one to another than are the members of the agricultural soils group collectively.

The three subgroups are as follows: (1) The soils of the higher tablelands, which occur on the nearly level higher plains of the county; (2) the soils of the sloping lands, including the agricultural

sandy loams and fine sandy loams on the more gentle slopes; and (3) the soils of the second-bottom lands of the larger streams, including the heavier textured Kalmia and Cahaba soils.

SOILS OF THE HIGHER TABLELANDS

The soils of the higher tablelands comprise the choice farming soils of the county and occupy the high smooth plains. They not only have the fundamental characteristics of agricultural soils, but it is in them that such characteristics are most nearly perfected. They occupy plains and afford extensive, smooth, nearly level fields which are comparatively unaffected by erosion. They are more uniform in characteristics and depth of the surface soil, absorb greater proportions of the rainfall, retain moisture and plant nutrients longer, and are characterized by more durable productivity than are any other well-drained upland soils of the county. The most prosperous farms are on these tablelands.

These soils occupy the high red plains south of Mount Pisgah Church in the vicinity of Highland Farms, the Pine Level vicinity west of Leakesville, the plains near State Line, and a number of smaller areas south and west of Avera. They are not extensive, as only about 26 square miles are mapped, 70 percent of which is estimated to be under cultivation.

The tableland plains in the southeastern corner and the small areas in the vicinity of Avera dominantly consist of soils with red subsoils, but soils with yellow subsoils dominate the Pine Level and State Line plains.

Red Bay fine sandy loam.—Red Bay fine sandy loam is restricted to the upland plains of red soils and is practically confined to the southeastern part of the county. A freshly plowed field presents the general appearance of a smooth nearly level surface reflecting a brown or reddish-brown color. The fine sandy loam surface soil is looser to a depth of 12 or 15 inches and is less coherent than is the bright-red sandy clay subsoil which extends to a depth ranging from 5 to 7 feet.

The organic matter in the surface soil is sufficient to impart a dark color during the first few years after the land is cleared, but it gradually grows less with increasing years of cultivation. Owing to the nearly level land surface and favorable clayey subsoil foundation, however, the dissipation of organic matter and of other plant nutrients is not nearly so rapid in this as in the sandy soils of the more undulating or rolling land.

The surface soil contains sufficient fine materials to draw moisture from the underlying clayey subsoil to promote normal crop growth through ordinary periods of dry weather, and it also contains sufficient fine sand to maintain the soil in a favorable physical condition for the absorption of rain water and the normal circulation of both air and moisture to protect the growing plants against undue injury during periods of prolonged rainfall. This favorable ratio of fine and coarse materials also facilitates root penetration and largely accounts for the moderately loose pulverulent physical condition, or good tilth, characterizing the plow soil.

Although the subsoil contains a much higher proportion of clay than the surface soil, it contains sufficient sand to prevent any mate-

rial degree of tightness or other physical developments to impede normal root penetration or movement of air and water. The presence of a relatively higher percentage of fine materials in the subsoil increases its moisture-holding capacity and therefore tends to restrict leaching and prevent undue droughtiness.

Downward from a depth ranging from 4 to 5 feet, the proportion of sand increases and the deep underlying material is almost pure sand which is exposed in deep gullies and on slopes leading downward from the borders of the tableland soils to stream valleys. This deep sand influences productivity and crop adaptation more indirectly, in that it provides downward drainage of ground water, or surplus water from the overlying subsoil. Owing to the nearly level surface relief and resultant slow run-off of water from the surface, such internal downward drainage exerts a great influence on crop adaptation.

The usual minor variations in texture and color occur in places, and the depth to the sand material underlying the subsoil, in most places from 8 to 10 feet, seems to be greater on that part of the plain about 2 miles south of Mount Pisgah Church.

The natural features of this soil render it adaptable to cotton, especially under bollweevil conditions, as a well-drained soil offers an unfavorable environment for this pest and a favorable condition for the proper maturing and ripening of the cotton crop. Although particularly suited to cotton production, the soil is also adapted to all the staple crops commonly grown. In communities where this soil is extensive, general farming usually prevails. About 70 percent of the land is under cultivation, and it is estimated that about 50 percent of this is devoted to cotton, 35 percent to corn, and the rest to such special crops as beans, peas, and sweetpotatoes.

With the usual fertilizer applications, normal seasonal conditions, and proper treatment, acre yields ranging from one-half to three-fourths bale of cotton, 20 to 35 bushels of corn, and of other crops accordingly, may be expected.

This is one of the best agricultural soils in the county, although it is not extensive, only 6.6 square miles being mapped. It is one of the highest priced soils, ranging in value under normal conditions according to its location, cultural improvements, and agricultural condition.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam occurs on the red soils plains in the southeastern part of the county, in association with Red Bay fine sandy loam. The Orangeburg soil differs from the Red Bay soil principally in having a gray or grayish-brown surface soil. As mapped in this county, the red sandy clay subsoil of Orangeburg fine sandy loam lies at a little greater average depth, but all other characteristics of the two soils appear to be very similar.

This soil occurs in close association with both the Red Bay and Ruston soils, and where the change from one to the other is gradual or especially irregular, minor areas resembling these soils are included.

This is an inextensive soil, only 2.7 square miles being mapped, about half of which is in cultivation.

The same crops as those grown on Red Bay fine sandy loam are grown on this soil in about the same proportions, but yields are

probably 5 or 10 percent lower on the Orangeburg soil. This is probably owing to the slightly greater depth of the clayey subsoil, making the Orangeburg soil a trifle less retentive of moisture.

The sale price of this land is perhaps \$5 an acre less than that of Red Bay fine sandy loam.

Blakely loam.—Less than a square mile of Blakely loam is mapped. It occupies shallow depressions associated with Red Bay and Orangeburg soils on the tableland plains. The 5- to 10-inch surface layer is rich dark-brown mellow loam. The subsoil is friable fine sandy clay of a maroon-red or darker red color than that of the Red Bay and Orangeburg soils.

Occurring as it does in depressions, this soil is the recipient of both organic and mineral materials which have been brought in by both surface and seepage waters from the slightly higher surrounding soils, and this process of accumulating plant nutrients has been in operation during the development of this soil. Owing to its topographic position, the average moisture content is greater than that of the surrounding and higher Red Bay and Orangeburg soils, the Blakely soil has a better moisture supply for growing plants, and the oxidation or dissipation of organic matter is retarded. This is the most fertile and productive well-drained soil in the county, as a result of the free internal drainage through an underlying sandy substratum and fair surface drainage of extremely heavy rainfall, as the depressions are very shallow.

Blakely loam as mapped here differs from most of the Blakely soil mapped in southwestern Georgia, in that the deep substratum material is sand, whereas that in Georgia is chiefly heavy clay.

Ruston fine sandy loam.—The essential difference in the general appearance of Ruston fine sandy loam and Orangeburg fine sandy loam is in the color of the subsoil. Ruston fine sandy loam has a less red, or a reddish-yellow or reddish-brown, fine sandy clay subsoil. Field observations indicate that the Ruston soil has a slightly higher proportion of fine materials in the lower part of the subsoil and upper substratum. Other features of the two soils are practically identical.

The usual minor variations in texture and color are included. The Ruston soils occupy a position, as regards color of subsoil, intermediate between the redder soils of the Red Bay and Orangeburg series on the one hand and the yellow soils of the Norfolk and Marlboro series on the other, and variations of the Ruston subsoil toward both yellow and red colors are common.

This soil is inextensive. It occurs in moderately small bodies in all sections. Some of the larger areas, which approximate 200 acres in size, are just northwest of Leakesville in the southeastern part of the county and south of State Line. A number of small bodies are in the vicinities of Avera and Neely.

As regards natural fertility, productivity, fertilizer needs, methods of management, and selling price, Ruston fine sandy loam is similar to Orangeburg fine sandy loam. Local utilization of the two soils would indicate no difference in crop adaptation, but in south-central Georgia peaches grown on Orangeburg soils are thought to take on a slightly redder color than those grown on Ruston soils; and, although neither of these soils is considered a tobacco soil in

central-southern Georgia, it is generally recognized that Ruston fine sandy loam will produce a better quality leaf than will the Orangeburg soil.

Ruston loamy sand.—Ruston loamy sand differs from Ruston fine sandy loam primarily in texture. Both soils occupy nearly level land and exhibit brownish-gray surface colors, but Ruston loamy sand is somewhat lighter in texture in both surface soil and subsoil. The surface soil is brownish-gray loamy sand, and the subsoil is sandy loam.

About two-thirds of this soil is mapped in the southeastern corner of the county, on the same plains with the Red Bay, Orangeburg, and Ruston fine sandy loams. Areas are southeast of Hillman, north and southeast of Rounsaville, and in the vicinities of Avera and Byrd. The bodies in the southeastern corner are more uniform than are those which occupy very small remnants of the high plain scattered throughout other parts. A few small areas south of State Line and one body 3 miles northwest of Leakesville have subsoils which are more yellow than typical.

This soil occupies a total area of 6.4 square miles. It occurs in smaller bodies than do the associated soils of the tablelands. A number of the areas are surrounded by nonagricultural soils, tending to isolate them. In addition, Ruston loamy sand, owing to a higher content of sand, is somewhat less productive and more inclined to droughtiness than are the other soils of this group, and probably not more than 50 or 60 percent of the land is cultivated.

The subsoil is comparatively loose sandy loam, and, as the cotton crop prefers a firmer sandy clay subsoil, it is better adapted to other soils of this group. Probably 30 percent of the cultivated area is devoted to cotton, 60 percent to corn, and the rest to truck crops. Sweetpotatoes seem to do well.

The usual quantities and mixtures of fertilizers are applied, and yields of the staple crops are probably 25 percent lower than on Red Bay fine sandy loam.

Marlboro fine sandy loam.—Marlboro fine sandy loam is a good agricultural soil and is the dominant soil on Pine Level plain. This plain is about 50 feet below the level of that part of the high plains on which most of the previously discussed red soils of the tableland group have developed.

The surface soil of Marlboro fine sandy loam is grayish-yellow fine sandy loam, 10 or 12 inches thick, and the subsoil is firm but friable bright-yellow fine sandy clay. The firm subsoil of Marlboro fine sandy loam lies at less depth, and the thick layer of material underlying the subsoil is of much heavier texture than is that underlying the Red Bay, Orangeburg, and Ruston soils. The proportion of organic matter in the surface soil is a little higher in the Marlboro soil.

These characteristics are reflected in the productivity and adaptation of this soil, as the higher proportion of fine materials provides the growing crops a greater degree of protection against droughts but, on the other hand, slightly increases the damage from long-continued periods of wet weather during the growing season. As corn and grasses require more moisture than cotton, they are better adapted to Marlboro fine sandy loam than to the other more sandy

soils of this group. Cotton is equally as well, or better, adapted to Red Bay fine sandy loam, as the average annual rainfall here is nearly 62 inches. The comparatively heavy textured substratum beneath the Marlboro subsoil tends to make the soil more retentive of moisture and probably of natural fertility. These factors to a great extent are responsible for the relatively high state of productivity of this soil.

Only 5 square miles of this soil are mapped, more than 50 percent of which is on the Pine Level plain a few miles west of Leakesville. Several bodies comprising a total of nearly 1 square mile are near State Line, and small areas are scattered in other parts of the county.

In addition to the usual included minor variations from the typical soil, a few areas having a thicker surface soil and a less firm subsoil, resembling Norfolk fine sandy loam, occur in the vicinities of Neely and Byrd and northwest of Leakesville. These would have been mapped as the Norfolk soil had they been more extensive.

This soil, like the other members of the group, is especially closely identified with the more highly developed type of general farming. It is a good producer of all the staple crops, and acre yields are about the same as those obtained on Red Bay fine sandy loam, the cotton yields being probably a little lower and the corn and hay yields slightly higher.

It is estimated that 80 or 85 percent of this soil is now under cultivation, and that the rest is devoted mostly to pasture and forestry. Probably 30 percent of the cultivated land is devoted to cotton, 55 percent to corn and hay, and 15 percent to beans, sweet-potatoes, peas, and other truck crops.

This is probably the highest priced land in the county, but it is only slightly higher priced than Red Bay fine sandy loam.

SOILS OF THE SLOPING LANDS

The agricultural soils of the sloping lands compose the most extensive subgroup of the agricultural soils, and 78 square miles are mapped. Although the soils of this subgroup occur in all parts of the county, more than 80 percent of their total area is in the southern half—the greater part in the vicinity of Neely where the largest bodies occur.

As expressed in the subgroup name, these soils occupy sloping or gently rolling land, and the characteristics wherein soils of this subgroup, as soils, differ from those of the tablelands, are such as have grown out of this topographic difference or have resulted from the effects of erosion. Soils of the sloping lands are less uniform, are more patchy and irregular, especially as regards thickness of the surface soil. Patches here and there have been stripped of their surface soils; in other places depositions of sandy materials have been made, and much of the fine material has been carried away in suspension by drainage waters. There are, to less degree, irregularities in the subsoils and underlying substrata.

The plow soil is continually losing organic matter to the surface drainage waters, and following each heavy rainfall seepage water carries mineral constituents, both in suspension and solution, down the slopes to escape in the drainage water. The topographic posi-

tion occupied by the soils of the sloping land, therefore, subjects them to impoverishing processes not associated with or, at least, not nearly so pronounced in the soils of the level lands.

As wide as are the differences between the soils of the two groups, considered purely as soils, their differences as crop producers are probably even greater. The patchy character of the areas and the textural irregularities, more especially of the surface soils and subsoils, are reflected in a corresponding irregular or patchy appearance of growing crops. The sloping soils are more inclined to droughtiness, owing to a greater loss of rainfall through surface run-off. This, together with the comparatively lower state of natural fertility, renders these soils much less productive. These soils are cut by an intricate network of drainageways, which leaves most of the fields small and ill-shaped, and, as plowing here must be done along contours and rows run on a level, this cut-up condition practically prohibits the use of modern heavy farm machinery. Up to recent times the impoverishing processes have operated largely under forested conditions, but when these slope soils are cleared and brought under cultivation, erosion becomes much more destructive and rapidly broadens the distinction between the two subgroups. That is, the potential or future cropping value of the slope soils becomes even more inferior. Adequate terracing and the growing of as many cover crops as are in keeping with efficient farm management are indispensable conservation measures against erosion if even a moderate degree of permanent productivity is to be maintained.

Norfolk fine sandy loam.—Norfolk fine sandy loam occupies slopes and rather gently rolling lands which are cut by narrow strips of swamp along drainage lines. It is a good producer where erosion can be controlled.

The plow soil is gray fine sandy loam, and the subsoil is a moderately bright yellow friable fine sandy clay. The organic content is not sufficiently abundant to materially affect the mechanical condition of the plow soil and scarcely high enough to impart a dark stain after the soil is cultivated a number of years. The fine sand content, however, insures satisfactory tilth conditions. The subsoil, having a high proportion of silt and clay and occurring at a slight depth, ranging from 12 to 16 inches, prevents undue droughtiness and affords a measure of protection against rapid leaching and loss of plant nutrients. It is typically sticky when moist but is free from extreme tightness, toughness, cementation, or other injurious characteristics. Although the underlying substratum is variable in color and texture, it typically contains sufficient fine materials to prevent excessive internal drainage, but it is in many places slightly cemented and rather slowly pervious. Where such a development has taken place in the upper part of the substratum it impedes internal drainage, increases the tendency of the soil to erode, and accounts for poorly drained seeped spots near the bases of slopes, despite the free surface drainage characterizing this soil.

A few small areas, mainly in the southeastern corner of the county, are a little coarser in texture than typical, but these were not sufficiently extensive to map separately. Other areas of minor color and textural variations are included, and in places small irregular areas of Susquehanna and Cuthbert soils are included where the boundaries are not distinct.

Norfolk fine sandy loam is the most extensive agricultural soil, 38.8 square miles being mapped. It is developed in all parts of the county, but about 70 percent of the total area is in the western half. It is most extensive southeast of Byrd, near Neely, and in the vicinity of Denco.

Most of this land is still in the cut-over condition, with probably not more than 20 percent in cultivation. All the common crops are grown, but corn and velvetbeans occupy about 70 percent of the cultivated land, a relatively smaller percentage is planted to cotton, and small acreages are devoted to such special crops as snap beans, sweet-potatoes, and garden peas. The natural adaptation of this soil is not very different from that of Marlboro fine sandy loam. Modern farm machinery can be used on the large, smooth fields of the Marlboro soil, but this would not be feasible on the rolling cut-up areas of Norfolk fine sandy loam, and this factor has considerable influence in the choice of crops. This soil is used extensively for the production of flue-cured tobacco in central-southern Georgia.

The customary mixtures and quantities of fertilizers are used, and under normal conditions acre yields of one-half bale of cotton, 15 to 25 bushels of corn, and of other crops in proportion may be expected.

Much of this land has been stripped of its original yellow pine since the World War, and it is still owned by the lumber companies. Very little land is changing hands, but the present market price of unimproved land of this kind is low.

Norfolk sandy loam, deep phase.—As a crop producer Norfolk sandy loam, deep phase, differs from Norfolk fine sandy loam primarily in being a little more droughty and slightly less productive.

The subsoil of Norfolk sandy loam, deep phase, lies at a depth of about 6 inches lower than that of Norfolk fine sandy loam. The surface layer of the deep phase, ranging from 16 to 20 inches in thickness, is in general lighter in texture and does not retain moisture so well as the corresponding layer of Norfolk fine sandy loam. In places much of this loose surface material has been deposited by colluvial wash. The sandy part of the surface soil is coarser than is that of Norfolk fine sandy loam, but aside from this textural difference the two soils show very similar characteristics.

About 10 square miles of Norfolk sandy loam, deep phase, are mapped, and this soil has the same general distribution as Norfolk fine sandy loam, with which it is very closely associated.

Probably the percentage of cultivated land is slightly less than of Norfolk fine sandy loam. Cotton is not quite so well adapted to Norfolk sandy loam, deep phase, and yields of crops in general are probably from 5 to 10 percent lower than on the fine sandy loam. This difference in the cropping values of the two soils, although slight, is in most instances reflected in the prevailing price of the land. Tobacco of excellent quality is grown on this deep soil in States farther east.

Ruston fine sandy loam, rolling phase.—Ruston fine sandy loam, rolling phase, as a crop producer, differs very little from Norfolk fine sandy loam. As soils, the color of their subsoils is the principal difference in general appearance, that layer of the Ruston soil being typically reddish-yellow fine sandy clay. The surface soil of the Ruston soil in places has a faint red cast, and the upper part of the substratum is slightly more pervious and less inclined to cementation than in the Norfolk soil, resulting in slightly better internal drainage.

Although this soil occurs in nearly every township, 75 percent of it is mapped in the southern half of the county. Most of the bodies are not large, being separated, or cut, by narrow strips of swamp along small streams. Areas are in the vicinities of Leakesville, Neely, Bothwell, and Avera and in the southeastern corner of the county. A total of 24.8 square miles is mapped.

A few small areas in the southeastern corner are slightly coarser in texture than typical. Accurate separations could not be indicated between this soil and Cuthbert fine sandy loam or Norfolk fine sandy loam in all places near and west of Neely and in the vicinity of Denco, but such variations are of small extent.

No distinction is made in crop adaptation between this soil and Norfolk fine sandy loam, but in States farther east it has been learned that the Norfolk soils are well adapted to the production of flue-cured tobacco, whereas the Ruston soils are not.

This soil is similar to Norfolk fine sandy loam in the percentage of land cultivated, acreage devoted to the various crops, management, and price.

Orangeburg fine sandy loam, slope phase.—Orangeburg fine sandy loam, slope phase, has a brownish-gray loose fine sandy loam surface soil, very similar to that of Ruston fine sandy loam, but the subsoil is brighter red fine sandy clay as compared with the reddish-yellow Ruston subsoil. All other characteristics of the two soils are practically identical.

A few areas 5 miles south of Mount Pisgah Church and a few smaller bodies along the George County line west of Highland Farms are slightly coarser in texture than typical.

This soil is not extensive. Nearly four-fifths of the total area occurs in the southeastern corner of the county.

Soil management and utilization are very similar to those practiced on Ruston fine sandy loam, but crop yields and price of land are slightly higher on the Orangeburg soil.

Most of this soil, like that of the slope phase of Red Bay fine sandy loam, occupies slopes around the borders of the tableland plains in the southeastern corner of the county. These two soils are not quite so badly cut by drainage channels as are the Ruston and Norfolk soils of the group. Principally for this reason a larger proportion, probably 35 or 40 percent, of the Orangeburg and Red Bay soils is cultivated to the same crops and with similar proportions of land in cultivation as of the Norfolk and Ruston soils.

Red Bay fine sandy loam, slope phase.—Plowed land of Red Bay fine sandy loam, slope phase, is more red than is Orangeburg fine sandy loam. Other differences in the general appearance of the two soils are minor. The average slope of the land occupied by the Red Bay soil is slightly milder, and consequently the soil is less eroded than is the sloping Orangeburg soil. The organic content of the Red Bay soil is probably a little greater, but such differences are very slight.

A total of only 2.9 square miles of this soil is mapped, entirely in the southeastern corner of the county. Minor surface variations from the typical soil, associated especially with the sloping soils, occur in places. Over many small areas where depositions or slope wash have been made, the material is slightly coarser in texture than typical.

Although this soil is similar in general appearance to Orangeburg fine sandy loam, slope phase, it seems to be slightly richer in nitrogen and possibly in potassium, and it gives slightly better yields of the common field crops. The present cultivated proportion of this soil is about the same as that of Orangeburg fine sandy loam, slope phase.

SOILS OF THE SECOND BOTTOMS

Soils of this subgroup occur on the second bottoms of the larger streams, which are locally called hammocks. The greater part of them is developed along the outer edges of the valleys of Leaf and Chickasawhay Rivers, and they represent an aggregate area of probably a little more than 60 square miles. The second bottoms, or terraces, are nearly level and lie high enough above the streams to escape overflow. Leakesville, McLain, Leaf, and Royce are located on soils of this group. The soils differ somewhat in drainage, but most of them are sufficiently drained for the production of such crops as corn, oats, hay, and most of the truck crops. Good drainage typically extends to a depth of a few feet, the normal water table in most places lying much higher than in the other agricultural soils. This condition tends to narrow the range of adaptation to field crops but especially fits these soils for the production of good pastures.

The land occupied by these soils was at one time stream-bottom land, and the present soils have developed from materials of stream deposition. The soils are stone free and easy to work.

The soils of this group differ in color and texture, and it is principally on a basis of such differences that the group is divided into several types of the *Kalmia* and *Cahaba* series.

Kalmia fine sandy loam.—The plow soil of *Kalmia* fine sandy loam is gray loose fine sandy loam, and the subsoil is yellow friable fine sandy clay. The physical character of the subsoil is favorable to plant growth, but in many places the upper part of the substratum, below the true subsoil, is somewhat compacted, or slowly pervious to water, although the substratum is variable in this respect, as well as in color and texture.

This soil occupies second bottoms, or terraces, of the larger streams and occurs only in the better drained situations.

The principal variations within areas of this soil as mapped in Greene County result from variations in the normal level of the water table. In many places along stream channels this is below a depth of 5 feet, but farther back from the stream the water table in places is within 3 feet of the surface. In a few areas south of Vernal Church, near the George County line, the surface soil is slightly coarser in texture than typical, and the depth of the subsoil from the surface ranges from about 12 to 20 inches.

A total of 42 square miles of this soil is mapped. It occurs in bodies ranging in size from a few acres to 400 acres. Some of the largest are southwest of Leakesville along the outer edges of Chickasawhay Valley and in similar positions along Leaf River, especially on the west side of the river around Leaf. Bodies are mapped along the larger tributaries, particularly Big Creek.

It is estimated that 10 or 15 percent of the land is cultivated. Practically no cotton is produced. Corn and hay are grown on probably 75 or 80 percent of the cultivated land, and the remainder

is devoted to snap beans, garden peas, sweetpotatoes, strawberries, sugarcane, and other garden and patch crops. A considerable acreage of this soil in the vicinity of McLain is devoted to sweetpotatoes.

Yields of crops differ widely, according to the character and quantity of rainfall. Heavy rainfall during the growing season is more injurious to crops on this than on other soils of the agricultural group, but *Kalmia* fine sandy loam is able to better withstand dry weather. The level land, high water table, and compact character of the substratum in many places are the principal factors accounting for these conditions. These factors, together with the location of this soil in the valleys, also retard soil warming and subject the crops to more danger from frost injury. Acre yields of corn range from 15 to 30 bushels; hay, from 1 to 1½ tons; sweetpotatoes, from 75 to 100 bushels; and of other crops in proportion.

The usual mixtures and quantities of commercial fertilizers are applied, and farm management is very similar to that practiced on the Red Bay and Orangeburg soils. The cut-over and poorly located areas have a low market price, but where the land is improved and well located the price is fairly good.

Kalmia loamy fine sand.—The lighter, or sandier, texture of *Kalmia* loamy fine sand accounts for the difference in general appearance from *Kalmia* fine sandy loam. The surface, or plow, soil of *Kalmia* loamy fine sand is gray light fine sandy loam or loamy fine sand, and the subsoil is typically grayish-yellow light sandy loam.

This is not an important soil, either as regards extent or agricultural worth. Only 9.1 square miles are mapped, and although it is an agricultural soil, it has low agricultural value. Most of the larger areas are on the second bottoms of Leaf River near McLain and northwest of New Hope Church, along Chickasawhay River near the southern county line and farther north, and on the second bottoms of Big Creek south of Jonathan.

Probably 5 or 10 percent of this soil is now devoted to crop production. The same crops are grown as on *Kalmia* fine sandy loam, probably in similar proportions. Yields, however, are in general about 25 percent less on *Kalmia* loamy fine sand. This lower rate of productivity is the result of the higher percentage of sand in the soil, and the sale value of the land is correspondingly lower.

Cahaba fine sandy loam.—*Cahaba* fine sandy loam is distinguished from *Kalmia* fine sandy loam in color, principally of the subsoil. The surface soil is typically brownish-gray loose fine sandy loam, and the subsoil is reddish-yellow fine sandy clay. Aside from color the two soils are nearly identical in all significant characteristics. The water table typically lies at a greater depth in the *Cahaba* soil than in the *Kalmia*, as the greater part of *Cahaba* fine sandy loam is developed near comparatively deep-cut drainage channels, which gives it slightly better underdrainage.

A few small areas mapped with *Cahaba* fine sandy loam near Pinegrove Church are characterized by a little coarser texture than typical, and there are other minor variations where this soil grades into closely associated areas of the *Kalmia*, Leaf, and Myatt soils.

A total of only 6 square miles of *Cahaba* fine sandy loam is mapped, most of which occurs in moderately small areas. About half the

total area is on the terraces, or second bottoms, of Leaf River and Chickasawhay River south of Leakesville, and several bodies are in the vicinity of Old Avera.

The proportion of the land in cultivation is a little greater than of Kalmia fine sandy loam, but the same crops are grown in similar proportions on both soils. The natural fertility of the two soils is apparently nearly the same, but growing crops on Cahaba fine sandy loam better withstand the effects of wet seasons, owing to more thorough underdrainage, and over a period of years the total yields on Cahaba fine sandy loam are slightly greater than those on Kalmia fine sandy loam.

Cahaba loamy fine sand.—The color of both surface soil and subsoil of Cahaba loamy fine sand is identical with that of Cahaba fine sandy loam, but the texture, physical character, and moisture conditions are similar to those of Kalmia loamy fine sand. Because the latter characteristics bear a much closer relationship to productivity of local field crops than does that of color, Cahaba loamy fine sand and Kalmia loamy fine sand, considered as producers of field crops, are practically identical. Experience in other States indicates that flue-cured tobacco is better adapted to the better drained areas of the Kalmia soils than to the Cahaba soils.

This is the least extensive soil in this group of agricultural soils, and, like Kalmia loamy fine sand, has a low agricultural value at present. An aggregate of only 3.4 square miles is mapped, most of which is in rather small scattered bodies, principally on the second bottoms, or terraces, of Leaf and Chickasawhay Rivers.

As regards all other features, including methods of management, utilization, and general relationship to agriculture, the loamy fine sands of the Kalmia and Cahaba soils may be considered practically identical.

FORESTRY AND RANGE SOILS

In the general discussion of agricultural soils the features of good drainage, favorable physical development, proper ratio of fine and coarse materials, mild relief, and resistance to erosion were mentioned and discussed as being essential requirements of all soils successfully utilized in this county as crop producers. Each of the agricultural soil types (previously discussed) comply to a considerable extent with these requirements or embody these fundamental characteristics, but in each of the remaining soil types and phases one or more of these characteristics is lacking. So far as successful production of the common field crops is concerned, they are, therefore, nonagricultural soils; that is, they are more profitably devoted to the production of timber and pasture or range grasses and, when referred to collectively in this report, will be designated as the forestry and range soils.

The forestry and range soils occupy between 75 and 80 percent of the county and are dominant in practically every township. It is estimated that about 30 percent of these soils is nonarable, owing to poor drainage or overflow; about 20 percent is submarginal, because of tightness in the subsoil and upper substratum, together with various degrees of hilliness and erosion; and the adaptation of 50 percent is restricted to timber growing and the production of range grasses, owing to a high content of sand associated in most places with strong

choppy relief and susceptibility to destructive erosion. They are all unproductive soils, so far as ordinary crops are concerned, owing to various causes. The adaptation of a number of these soils is restricted to the growing of timber, a few of them because of frequent overflow, but most of them because of droughtiness; but on many of the soils either grass or timber can be grown and on some a combination of both is naturally produced. The fundamental soil characteristics more closely associated with such adaptation are texture, natural moisture conditions, and relief, or stage of, and susceptibility to, erosion. Hence, for convenience, the forestry and range soils are divided into four subgroups largely on the basis of these features, and consequently of adaptation, as follows: (1) Sandy soils of the rolling uplands and terraces; (2) heavy soils of the rolling uplands, which occur on the highly erosive uplands that have tight slowly pervious subsoils; (3) wet soils of the river terraces and uplands, which occur on poorly drained stream terraces, or second bottoms, but are above stream overflow; and (4) first-bottom soils which occur on stream flood plains and are subject to overflow.

SANDY SOILS OF THE ROLLING UPLANDS AND TERRACES

The sandy soils of the rolling uplands and terraces range in texture from light sandy loam to loose incoherent sand and in color from gray to reddish yellow. Erosion has been very active, the resulting surface relief ranges from that of moderately gullied land to broken hilly waste land, and sheet erosion has been heavy in all places. Owing to the shifting and carrying away of soil materials, areas of these soils have become reduced to a complex intermixture of various soil conditions characterized by abrupt changes over short horizontal distances, especially regarding the character and thickness of the surface soil. One soil type, Kalmia sand, occurring on nearly level stream terraces, is included with this subgroup of soils because of its very sandy, droughty characteristics.

The original forest cover of these soils was an almost pure stand of longleaf pine which has been cut for lumber. Range hogs, uncontrolled forest fires, and scarcity of seed trees have prevented natural reforestation of the same species, and the present sparse cover consists largely of a scrubby growth of oaks, with only a few scattered pines. The sandy texture, strong relief, and eroded condition characterizing these soils render them, with few exceptions, too droughty for satisfactory production of grass. Such land is, however, well adapted to growing longleaf pine.

A total of approximately 165 square miles of these soils is mapped. They occur on the uplands of all parts of the county and predominate along the drainage slopes of the larger streams in the southeastern, west-central, and central-eastern parts.

Based on differences in texture, color, and erosive conditions, the soils of this group are divided into the sandy members of the Ruston, Norfolk, and Kalmia series, and rough broken land.

Ruston loamy sand, rolling phase.—Ruston loamy sand, rolling phase occurs in the rolling or hilly parts of the county. The surface soil is gray or brownish-gray loose loamy sand, and the subsoil is typically reddish-yellow loamy sand or light sandy loam. The organic-matter content is extremely low, owing partly to active erosion.

In keeping with the soils of this group, this soil is very variable as to texture, character, and thickness of the loose surface soil and the color of the soil material to a depth of 2 feet. The soil is very intimately associated with Ruston sandy loam, deep phase, and during the mapping of the soils it was necessary in places to arbitrarily place lines separating these two Ruston soils. Erosion has so seriously disturbed the development of this soil that it has been reduced almost to a mere soil condition rather than a soil type.

This is an extensive soil, 37.7 square miles being mapped, about half of which is in the southeastern part of the county. It is extensively developed south of Rounsaville along the Alabama State line and on the slopes of Brushy Creek; a rather large acreage is in the northwestern part in the vicinities of Piave, Carson City, Bothwell, and Sand Hill, and scattered areas are throughout the central part.

Practically none of this land is cultivated. It is typical of the forestry and range rolling sandy soils. Much of it can be bought at a very low price. The land should be reforested to longleaf pine, the dominant species of the original forest.

Ruston sandy loam, deep phase.—Ruston sandy loam, deep phase, is closely associated with Ruston loamy sand, rolling phase, and in general presents a very similar appearance. It is distinguished from that soil in that the lower part of the subsoil of the deep phase contains more clay. The higher percentage of fine materials in the lower part of the subsoil renders this soil slightly less droughty, but other than this these two Ruston soils are practically identical.

This soil occupies rolling and dissected hilly land where erosion has radically disturbed normal soil development. It is nearly as extensive as Ruston loamy sand, rolling phase, and has similar distribution, with the exception that more of it is developed in the west-central part of the county in the vicinity of Neely, around Avera, and southwest of Jonathan; and it is less extensive in the northwestern corner.

Erosion has left the soil with no uniformity as to depth of surface soil, and, owing to heavy loss of rainfall by surface run-off, susceptibility to erosion, and sandiness, the land is too droughty for satisfactory crop production. A few small patches or ridges along highways near the villages are cultivated. Corn, hay, and patch crops are commonly grown but with very uncertain results. With the possible exception of small acreages here and there in the better areas, this soil, together with the other rolling forestry and range soils, should be devoted largely to the production of longleaf pine. The selling price is very little higher than that of Ruston loamy sand, rolling phase.

Norfolk loamy sand.—The surface soil of Norfolk loamy sand is gray loamy sand, and the subsoil is grayish-yellow loamy sand. In general appearance, except color, this soil is similar to Ruston loamy sand.

The usual irregularities associated with the rolling sandy soils are to be expected, as this soil is typical of the group. In many places it is difficult to satisfactorily separate the Ruston and Norfolk loamy sands, necessitating the inclusion with the Norfolk soil of small areas resembling the Ruston soil.

A total of 22.3 square miles of Norfolk loamy sand is mapped, most of which occurs in rather small irregular-shaped areas scattered

over the entire county. Some of the larger bodies are north of Rounsaville along the Alabama State line.

In all characteristics that materially influence the value and utilization of the land, this soil and Ruston loamy sand, rolling phase, are very similar.

Norfolk sand.—Norfolk sand consists of nearly pure sand both in the surface soil and subsoil, and it differs from Norfolk loamy sand in that it contains less fine materials. Norfolk sand is less fertile and more droughty than any other rolling sandy soil.

A number of very small patches consisting of nearly white quartz sand, which resemble Lakewood sand, are included, as the aggregate of such areas is not sufficient to justify their separation.

Only 4.6 square miles of Norfolk sand are mapped, and about two-thirds of the total area is in the central-eastern part of the county along the Alabama State line north of Rounsaville. Small scattered areas are in other parts.

Owing to extreme droughtiness, this soil is unfitted for crops and is even less adapted to the growth of grass than are the other members of the rolling sandy soils. It would support a comparatively slow growth of longleaf pine if it were reseeded and the present scrubby growth of drought-resistant oaks were removed. This is probably the most droughty and least productive soil in the county.

Kalmia sand.—Kalmia sand is developed on the sandy part of the stream terraces, and its surface relief is nearly level. This soil consists of sand throughout. The surface soil is gray sand containing very little organic matter, and, at a depth ranging from 20 to 30 inches, the color is yellowish gray. This soil is well drained to a depth ranging from 4 to 5 feet. It is a poor and unproductive soil and is, therefore, included with the subgroup of sandy soils of the rolling uplands and terraces, although it differs from the rest of such soils as regards relief and susceptibility to erosion. The principal variation in the different areas mapped is the texture of the sand, which is rather fine in some places.

Areas of this soil aggregate a total of 12.3 square miles, and practically all of it is on the terraces of Chickasawhay River. Some of the larger bodies are north of Vernal School, north of Leakesville, and in the vicinity and north of Old Avera.

This soil is, like the rolling sandy soils, too droughty for satisfactory production of grass and is better adapted to growing longleaf pine.

Rough broken land.—Rough broken land represents areas through which Leaf and Chickasawhay Rivers have cut channels more than 150 feet below the level of the remnants of the higher plains. This condition is conducive to erosion. In some places the slopes, which extend from the remnants of the higher plains to the river valleys, are short, giving the tributary streams a fall of more than 100 feet within a distance of 2 or 3 miles. Resultant rapid erosion has developed deep dissection and left a series of high, narrow, sharp ridges. Similar developments, on a smaller scale, have taken place along the drainage slopes of many of the larger tributaries several miles inland from the river valleys, resulting in alternate gullies and sharp ridges with steep slopes. This is the most severely eroded land in the county.

The soil material consists mainly of sand, although silt and clay dominate in a number of places. Moundlike knolls of red and yellow sand rock occur in several places.

Rough broken land is mapped in scattered areas in all parts of the county, the total area being 55.2 square miles. The larger bodies include the Jane Hills on the west slope of Chickasawhay River Valley 6 miles north of Leakesville, the Sandy Creek Hills on the east slope of the same valley about 6 miles south of Leakesville, and the Skull Creek Hills northwest of Neely.

Rough broken land should be devoted only to timber growing.

HEAVY SOILS OF THE ROLLING UPLANDS

The heavy soils of the rolling uplands occupy land forms ranging from rolling to hilly, where surface run-off is heavy and erosion is destructive. They are characterized by gray or brownish-gray surface soils and tight, slowly pervious, fine sandy clay subsoils. The underlying substratum is also heavy textured and sufficiently tight to materially retard the movement of water, resulting in very slow or poor underdrainage. Since such a small proportion of the heavy rainfall is absorbed by the subsoil and substratum, the surface soil readily becomes saturated, in which condition it is easily eroded and carried away by drainage waters. When these soils are cleared and plowed, the process of erosion becomes much more devastating, and fields soon assume the appearance of a barren waste. The deep subsoil is unable to absorb a sufficient proportion of the rainfall to hold an adequate reserve supply of moisture for shallow-rooted crops, even during ordinary periods of dry weather. On the other hand, several days' continued rainfall, maintaining the surface soil in a saturated condition, is no less injurious to growing crops. The impervious character of the subsoil and substratum leads to the inclusion of these soils in the group of forestry and range soils rather than in the group of agricultural soils.

Susquehanna fine sandy loam and Cuthbert fine sandy loam constitute this group of heavy soils which occupy a total area of 158.2 square miles.

Susquehanna fine sandy loam.—The tightness of the subsoil of Susquehanna fine sandy loam is associated with stickiness, toughness, and plasticity of the material. This soil is locally referred to as a "gumbo soil." The surface soil, where present, is gray fine sandy loam, and the subsoil is clay or clay loam, somewhat variable in the proportions of yellow, brown, and red colors, with reddish yellow predominating.

In many places the surface soil has been washed away, and in other places slope depositions have accumulated. In places the fine sandy loam surface soil is so thin, or so much of it has been eroded, that a clay loam surface soil has resulted. A large area of this heavier soil is developed in the extreme southwestern corner of the county, and one is northeast of New Hope Church.

About 35 square miles of this soil are mapped, nearly three-fourths of which occurs in the western half of the county. The larger areas lie 7 miles southwest of Hillman, near Vernal Church, just west of Rounsaville, 6 miles south of State Line, and along the Perry County

line northwest of Avera, and smaller bodies are in the uplands in all parts.

This is nonarable land, produces poor pasture, and the best known use to which it can be devoted is growing longleaf pine. In order to conserve the surface soil as long as possible, the land should never be cleared and plowed.

Cuthbert fine sandy loam.—Cuthbert fine sandy loam is differentiated from Susquehanna fine sandy loam primarily because the tightness of the Cuthbert subsoil is not quite so intense and is due more to cementation and probably compaction. Cuthbert fine sandy loam, as typically developed, contains a higher proportion of sand or coarser materials than the Susquehanna soil. Other general characteristics, including color, of the two soils are similar.

Much of this soil is developed in close association with Susquehanna fine sandy loam, and in such areas the tightness of the subsoil and substratum seems to be due more to high clay content, as indicated by plasticity, and less to cementation. The upper part of the subsoil in many places is somewhat looser and more friable than typical. In those areas of the Cuthbert soil geographically removed from the larger areas of the Susquehanna soil, more cementation and less plasticity are evident. Several areas on the east slope of the Chickasawhay River Valley south of Leakesville are lighter in texture than typical. Similar areas lie southwest of Clark and south of Freeman School. Inclusions of small areas with a more yellow subsoil, rather than the typical reddish-yellow color, are common.

This is a very extensive soil, 123.7 square miles being mapped. It is one of the dominant soils in nearly all the upland parts of the county except the southeastern quarter. Large areas are developed northwest of Old Avera, in the vicinity of Piave, north of Rounsaville, along the Big Creek-Leaf River divide, and throughout the western part.

The tight subsoil and upper substratum of this soil restrict utilization as in Susquehanna fine sandy loam but not quite to the same degree. Profitable utilization of the land is restricted largely to forestry, preferably to growing longleaf pine. A somewhat more vigorous growth may be expected on the Cuthbert soil, as the degree of imperviousness in the subsoil and substratum is not quite so great as in the corresponding layers of Susquehanna fine sandy loam.

WET SOILS OF THE RIVER TERRACES AND UPLANDS

The wet soils of the river terraces and uplands occupy poorly drained positions in the larger stream valleys, but which are sufficiently high to escape stream overflow, and flat wet areas on the uplands. In their natural condition they are not sufficiently drained for growing cultivated crops, but most of them are adequately drained for the production of excellent pasture grasses. Although longleaf pine is better adapted to the rolling sandy soils, slash pine will do equally as well, probably better, on the poorly drained soils of the second bottoms.

Although either timber or grass, or in many places a combination of the two, naturally do well on these soils, the fact that the county has a large acreage of rolling forest and range lands which is better adapted to timber growing and less adapted to grass, leads to the

logical expectation that these soils will be utilized largely as pasture land. Natural adaptation and efficient land utilization therefore set the soils of this group apart as pasture soils.

These soils occur chiefly on the terraces of all the larger streams, but the greater part of them occupies the second bottoms of Leaf and Chickasawhay Rivers. A total of 68.8 square miles is mapped. Largely on bases of differences in color, drainage conditions, and degree of perviousness of the subsoils and substrata, the soils of this group are separated into Leaf, Myatt, Plummer, Dunbar, and Grady soils.

Leaf fine sandy loam.—Leaf fine sandy loam is typical of the wet second-bottom land. The surface soil is gray fine sandy loam, and the subsoil is tough plastic fine sandy clay, the color of which is typically a mixture of gray, yellow, and red.

A few areas near Pinegrove Church, bodies south of Leakesville, and one area south of Freeman School are slightly heavier in texture than typical. In these areas drainage conditions change somewhat from place to place, as does the degree of plasticity of the subsoil.

A total of 20 square miles of Leaf fine sandy loam is mapped. This soil occurs in all parts of the county where stream terraces are developed, but more than half the total area is on the terraces of Leaf and Chickasawhay Rivers. The average size of the bodies is greater than that of most areas of upland soils. Some of the larger bodies lie east of Chickasawhay River, southwest of Knottown, and near McLain.

This soil is well adapted to pasture, for which purpose it should probably be used in preference to any other form of utilization feasible under present conditions.

Leaf fine sandy loam, better drained phase.—Leaf fine sandy loam, better drained phase, differs from typical Leaf fine sandy loam in characteristics resulting from the better drainage conditions associated with land of this phase. The organic-matter content is typically slightly lower in the better drained soil, and the red color is more prominent in the subsoil.

Land of this kind, although better drained than typical Leaf fine sandy loam, is not adequately drained for the growth of cultivated field crops, but it is sufficiently supplied with moisture to support a luxuriant growth of slash pine or a heavy sod of carpet grass, Dallis grass, and lespedeza. It is an excellent pasture soil.

A few acres here and there throughout the county are cultivated, but yields are not satisfactory. This is an unfavorable soil for ordinary cultivated crops, owing to poor drainage and the plastic impervious subsoil and substratum.

An aggregate of 13.4 square miles of this soil is mapped. It is closely associated with typical Leaf fine sandy loam and has similar distribution and adaptation.

Myatt very fine sandy loam.—The surface soil of Myatt very fine sandy loam is similar to that of Leaf fine sandy loam, except that the Myatt soil is slightly finer in texture. The principal differences between the two soils are those of color and consistence of the subsoils and substrata, the underlying Myatt material being less tough and plastic and showing more gray and less yellow and red colors.

Poor natural drainage and a higher water table exclude this soil from the agricultural group, but, like the Leaf soils, it is sufficiently drained for the production of grass.

A few areas near Pinegrove Church and southwest of Rounsaville are more poorly drained than typical. Subsoil variations occur where the boundaries between this soil and the Leaf or Plummer soils are gradational. The surface texture in some bodies approaches fine sandy loam.

A total of 23.2 square miles of this soil is mapped. The soil occurs on most of the larger stream terraces. Some of the larger bodies are on the Chickasawhay River terraces southwest of Pinegrove Church, northeast of Leakesville, and in the vicinity of Knottown.

Considering natural adaptation and economical utilization of this soil, its best use is the growing of pasture grasses.

Plummer loamy fine sand.—Plummer loamy fine sand is distinguished from Myatt very fine sandy loam largely in texture, especially of the subsoil. The subsoil of Plummer loamy fine sand consists of gray quicksand or water-logged sand which is saturated much of the time. The surface soil differs from that of the Leaf and Myatt soils in being slightly coarser.

Plummer loamy fine sand differs from the other members of this subgroup of soils in that the greater part of it occurs on the uplands along drainageways at the foot of slopes where seepage is prevalent. In the northeastern corner of the county, the drainage valleys are broader and the intervening ridges present a milder outline in contrast to other parts, but similar to the surface relief of much of Washington County, Ala. This part of the county is underlain by an impervious substratum. Other areas of Plummer loamy fine sand occupy poorly drained parts of the Chickasawhay River terraces. These two phases of the Plummer soil are practically identical in adaptation and use.

Only 10.6 square miles of this soil are mapped, more than half of which occurs in rather small irregular-shaped bodies in the northeastern corner of the county along the Alabama State line. Most of the remainder is included in a large body east of Leakesville.

Land of this kind should be devoted to the growth of pasture grasses and slash pine, although it is considered somewhat inferior to the Leaf and Myatt soils for the production of grass.

Dunbar fine sandy loam.—Dunbar fine sandy loam is restricted to slopes and depressions in the uplands, where sufficient seepage of water collects to maintain the soil in a semisaturated condition part of the time. It is very closely associated with Plummer loamy fine sand, and the two soils are similar, except that the Dunbar soil is slightly better drained and slightly heavier. The surface soil is gray fine sandy loam, and the subsoil is grayish-yellow fine sandy loam or sandy clay. This is an intermediate soil between Norfolk fine sandy loam and Plummer loamy fine sand in color, drainage, texture, and general physical characteristics.

Less than 1½ square miles are mapped, practically all of which occurs in the northeastern corner of the county south of State Line. This is a good pasture soil.

Grady very fine sandy loam.—Grady very fine sandy loam is an inextensive soil having a total area of less than one-half square mile. It occupies distinct depressions in the high tableland plains of the

southeastern corner of the county and west of Leakesville on Pine Level.

The surface soil, to a depth ranging from 8 to 12 inches, is dark-gray very fine sandy loam, and the subsoil is whitish-gray very fine sandy clay containing yellow and brown splotches.

The dominant tree growth is gum, with an occasional cypress. Pines do not grow naturally on this soil. If the trees were thinned or entirely removed, an excellent sod of carpet grass could be produced, but the occurrence of the soil in small isolated areas detracts from its value as pasture land.

FIRST-BOTTOM SOILS

The first-bottom soils occupy the overflow land along the streams, and they are periodically altered to greater or less extent by the action of flood waters. Poor drainage and susceptibility to overflow remove these soils from the agricultural group, although most of them are naturally very fertile. The narrow flood plains along the smaller streams consist of an accumulation of local soil material, but the broader flood plains of Leaf and Chickasawhay Rivers are composed in part of material from the headwater streams, which cross regions of Vicksburg limestone and associated formations, and they are probably richer in lime and other mineral constituents.

The greater part of the flood-plain soils is well suited to the production of carpet grass, lespedeza, Dallis grass, and other pasture grasses, but the encroachment of a characteristic luxuriant tree growth has tended to crowd out the grasses. The tree growth differs somewhat with drainage, soil texture, and other soil conditions.

Some of the higher parts of the present flood plains, especially along Chickasawhay River, were cultivated to such crops as corn, sweetpotatoes, pumpkins, and rice by the early settlers, and good yields are said to have been obtained, but, with very few exceptions, farming on the flood plains has been abandoned.

About 80 percent of the flood-plain soils occurs along the two rivers and the large creeks, and narrow strips are along most of the smaller tributaries. This group of soils occupies 21.6 percent of the area of the county.

These soils differ considerably in drainage conditions, texture, content of organic matter, and degree of disturbance by flood waters. This subgroup includes the Ochlockonee and Bibb soils and undifferentiated swamp and muck lands.

Ochlockonee silty clay loam.—The Ochlockonee soils represent the best drained soils of the flood plains, and they are the only brown soils in this subgroup. Like all the first-bottom soils, they are subject to periodic overflow, but during most of the time the surface soil, to a depth ranging from 20 to 30 inches, has fair or good drainage.

The 6- or 8-inch surface soil of Ochlockonee silty clay loam is typically dark rich-brown silt loam. The subsoil, to a depth of about 30 inches, is lighter brown or yellowish-brown firm moderately friable silty clay. The substratum is variable but typically is gray silty clay containing yellow and brown splotches. The content of organic matter is only moderate, and this material is thoroughly mixed with the surface soil.

This soil is restricted to the flood plains of Leaf and Chickasawhay Rivers, the materials of which have been contributed in part from the Vicksburg limestone region farther north.

The areas are more or less cut by abandoned river channels, or "dead rivers", sloughs, and drainage lines. In places, along the banks of the old channels and larger streams, narrow strips containing a higher proportion of fine sand are included. Minor differences in drainage conditions and color also occur.

The characteristic occurrence of this soil is in large bodies of rather regular outline. A total of 10.6 square miles is mapped. The soil occurs only in the river bottoms, some of the larger areas lying along Leaf River near Leaf and north of McLain, and along Chickasawhay River southwest of Pinegrove Church.

This soil is one of the richest in natural fertility, but it is restricted to timber growing and range pasture, owing to its susceptibility to overflow. A luxuriant forest, consisting of gum, water-loving oaks, some maple, spruce pine, hickory, ash, tuliptree (locally known as tulip poplar), ironwood, and holly, with an occasional cypress, covers most of the land. The undergrowth is light in most places, and grass has been largely crowded out.

If protected from overflow, this would be a very productive soil, especially for corn, oats, sugarcane, and hay crops, but it is not sufficiently extensive to justify such an expense. If the forest growth were sufficiently thinned, excellent pasture could be produced, but the additional income from pasture would probably be insufficient to offset the necessary labor of keeping down the forest growth. The present prevailing use of this soil for timber growing and livestock range is its best use.

Ochlockonee fine sandy loam.—Ochlockonee fine sandy loam differs from Ochlockonee silty clay loam primarily in texture, but the fine sandy loam occurs for the most part in narrow strips along the banks of the larger streams. It is naturally well drained to a somewhat greater depth than the silty clay loam which occurs farther inland. The surface soil of Ochlockonee fine sandy loam is typically brown pulverulent fine sandy loam with an organic content slightly less than that of Ochlockonee silty clay loam. The subsoil is more variable, but in many places it is slightly lighter in texture than the corresponding layer in the heavier soils of the Ochlockonee series.

This soil is closely associated with both Ochlockonee silty clay loam and swamp, and where the change from one soil to the other is very gradual or irregular in outline, small areas resembling these soils are included.

This is not an extensive soil, only about 6 square miles being mapped. With the exception of a large body near Leakesville, the soil occurs in narrow strips along the channels of Leaf and Chickasawhay Rivers.

Owing to stream overflow, this soil is restricted to timber growing and range for livestock. The forest growth is very similar to that on Ochlockonee silty clay loam, but the proportion of oaks is greater and of cypress is less. The tree growth, though not quite so luxuriant as that on the silty clay loam, is sufficiently heavy to prevent the growth of grasses to a large extent.

Bibb silty clay loam.—Bibb silty clay loam occurs in close association with the Ochlockonee soils, but it is more poorly drained, and

consequently the surface soil and subsoil are more gray, the uniform brown color of the Ochlockonee soils being absent. The surface soil is very light gray silt loam or silty clay loam containing faint splotches of brown and yellow. The subsoil is gray plastic silty clay mottled with yellow, brown, and blue. The organic content of the surface soil is small.

The principal variations included with this soil are such as result from different degrees of drainage. Some of the land approaches a swampy condition, but small areas having brown surface soils are nearly as well drained as the Ochlockonee soils.

About 29 square miles of this soil are mapped, about 90 percent of which is on the flood plains of Leaf and Chickasawhay Rivers. The greater part occurs in large bodies. A total of 3 or 4 square miles lies along the larger creeks including Mason and Hellhole Creeks.

The forest is heavy and rather dense, but the undergrowth is thin and practically no grass grows. Cypress and gum are common trees, but most of the other species, such as grow on Ochlockonee silty clay loam, are less abundant. This land is devoted to timber growing and range pasture, mostly for hogs.

Swamp.—Swamp includes that part of the inorganic soils of the flood plains, which, in general, remains wet most of the time. The material is not uniform. Most of it is mapped along small streams and intermittent drainageways, which ramify practically all the uplands. Much of the material consists of colluvial wash and in textural character resembles the soils of the adjacent slopes, which in places are sandy and in others are largely silt and clay. The quantity of organic matter over the surface ranges in thickness from a trace to almost a 12-inch cover of mucky material, depending largely on the character and density of the vegetal cover and the rate at which colluvial and alluvial mineral materials are being deposited.

Many of the swampy strips along the sinuous courses of the smaller drainageways are less than 200 feet wide, and in many such places areas mapped as swamp include the lower fringes of seeped slopes. Only a sparse stand of trees, mostly gum, grows on the swamp in most of the localities where Susquehanna soils predominate, and a similar but slightly heavier stand of gum is supported on strips of swamp extending through areas of Cuthbert soils. Along small streams penetrating uplands dominated by the lighter textured Norfolk and Ruston soils, such trees as gums, oaks of several lowland species, some maple, cypress, ash, bay, and scattered magnolia and pine form a dense growth on the swamp areas.

A very sandy phase of swamp occupies narrow strips along the deeper stream channels, where it is closely associated with the Ochlockonee soils but is more sandy and subject to more shifting by flood waters. It consists dominantly of gray sandy material containing various small proportions of silt and clay. It has not been in place a sufficient length of time for the accumulation of a significant quantity of organic matter.

About half the total area of swamp occurs along Leaf and Chickasawhay Rivers, and the rest lies along the larger creeks, including Big, Mason, Atkinson, Sand Hill, and Hellhole Creeks. A part of the land is forested with a less vigorous stand of the same species of

trees that grow on Ochlockonee fine sandy loam, and the rest, which is nearly pure quartz sand, supports practically no vegetation. Swamp land is used, together with the Ochlockonee and Bibb soils, for timber growing and range pasture.

The characteristic occurrence of swamp in long narrow strips and the absence of large bodies render any attempt at artificial drainage, or even of fencing, impractical. The practical cropping value of upland soils occupying the drainage slopes throughout the county is materially reduced, owing to their cut-up condition brought about by narrow strips of swamp and muck.

Muck.—With very few exceptions, muck occurs along the smaller streams and drainageways, occupying the same relative position as swamp. Except in a few places, where drainage has been recently effected by either natural or artificial channel cutting, muck, as accumulated in this county, is almost constantly saturated. Other than a few baylike areas on the Chickasawhay River terraces, the continuously saturated spots, evidently necessary to the accumulation and preservation of muck in this climate, occur only in areas receiving seepage of water. Consequently, practically all the muck is in the narrow stream valleys, especially near drainage heads flanked by seeped slopes.

As stated previously, most of the drainage of the Susquehanna and Cuthbert soils is surficial, with little or no seepage from the slopes. Consequently no muck is accumulated along drainage lines penetrating these soils. In localities where sandy soils predominate, more especially where these are underlain by impervious substrata, seepage and the consequent accumulation and preservation of muck, are more common.

A high proportion of bay and less numbers of the species of trees constituting the swamp forest make up the typical tree growth on muck. In some of the broader areas titi is a common shrub, with blackberry briers and gall-berry bushes around the edges, and in many places running briers and vines form a thick mass. Sphagnum moss grows in places. The small amount of grass growing on the muck areas is coarse and unpalatable.

In most places the muck is black, or nearly so, finely divided material. When the water is drained out, the muck settles to a much thinner layer.

One of the largest areas is east of Leakesville. While the timber was being cut, a channel was cut through this area, lowering the water table about 2 feet, and the area is now occupied by a shallow phase of muck, ranging in thickness from 1 to 2 feet. The vegetation here consists dominantly of cypress and gum. A few other mucky "bays" occur on the Chickasawhay River terraces south of Leakesville, but they have not been drained. Bay trees and vines are numerous in such areas.

Practically all the muck may be considered swampy land and, like the mineral swamp land, is best devoted to the production of timber.

SOILS AND THEIR INTERPRETATION

Greene County lies entirely within the Gulf Coastal Plain and forms a part of the sand and clay belt which extends across the State in a north and south direction between the silty belt on the west and the clay belt on the northeast.

Practically all the upland soils are derived from unconsolidated deposits of Tertiary age. The prevailing materials are siliceous sands, although more or less irregular layers of clay are present near the bottom of the sand formations or intervene between strata of sand. Both sand and clay materials are low in content of lime and magnesia.

Where the sands contain considerable iron they have a tendency to harden and form ferruginous sandstones which vary in character from a weakly cemented mass to firmly indurated ironstone. Owing to such formations, short ridges or small isolated hillocks, in places truncated, cone shaped, and capped with sandstone, rise above the surrounding surface. The thickness of such ledges in most places is not more than 3 feet. Washing of the looser sand from the interstices reveals a great variety of fantastic shapes characteristic of concretionary bodies. Massive sandstones ranging from 3 to 4 feet in diameter are rare. Such formations are not nearly so numerous here as in the sand and clay belt farther north, where the sands are coarser in texture, more ferruginous, and less micaceous.

Here and there in small areas are small rounded pebbles similar to those of the Tifton soils. They are more numerous in association with the Marlboro soils and the heavier types of the Norfolk and Ruston soils than with the red soils. Some of these pebbles have the general shape of a peanut hull but are many times larger. They are yellow and are well indurated.

The soils have developed under a forest cover and in a locality where the climate is marked by high average temperature and heavy rainfall. The forest prevented the growth of grass and a rich accumulation of organic matter in the soils. The high summer temperatures hastened the process of oxidizing and dissipating the scant supply which did accumulate under the forest cover. The erosive and leaching processes resulting from the heavy rainfall, without the retarding influences of a snow cover or frozen soil, have continued their work of denudation and impoverishment. The well-drained soils are, therefore, natural products of their environment, in that they are low in organic matter and are leached of soluble constituents. All horizons of all the soils tested are acid.

Table 4 shows the pH values of several soils in the county. These determinations were made by the hydrogen-electrode method, in the laboratories of the Bureau of Chemistry and Soils, United States Department of Agriculture.

TABLE 4.—*pH determinations of several soils in Greene County, Miss.*

Soil type and sample no.	Depth	pH	Soil type and sample no.	Depth	pH
Red Bay fine sandy loam:	<i>Inches</i>		Marlboro fine sandy loam:	<i>Inches</i>	
425610.....	0-10	5.3	425653.....	0-2	5.1
425611.....	10-16	5.7	425654.....	2-5	5.1
425612.....	16-40	5.5	425655.....	5-9	5.1
425613.....	40-90	5.5	425656.....	9-28	5.1
Orangeburg fine sandy loam:			425657.....	28-48	5.1
425614.....	0-10	5.2	Norfolk fine sandy loam:		
425615.....	10-18	5.8	425649.....	0-4	4.9
425616.....	18-42	5.5	425650.....	4-14	4.9
425617.....	42-56	5.5	425651.....	14-38	4.9
Ruston loamy sand:			425652.....	38-50	4.9
425658.....	0-6	5.3			
425659.....	6-40	5.3			
425660.....	40-52	5.3			
425661.....	52-78	5.3			

Soil development has been severely disturbed by erosion or inhibited by poor drainage. Leaf and Chickasawhay Rivers have cut channels across the county more than 150 feet below the level of the remnants of the higher plains, and some of the larger tributary streams have ramified all parts with channels proportionally deep. The drainage slopes to these streams occupy about 70 percent of the area of the county. Sheet erosion has been almost universal and gully-ing common; dissection is thorough, in places deep; and soil development has been seriously disturbed.

About 20 percent of the total area is occupied by poorly drained soils, most of which are on the flood plains of the streams. The immature soils here are young, not only in point of time but in the processes of development which have been inhibited by poor drainage. The higher terrace soils are adequately drained, but they are relatively young, owing to the rather short time (geologically) the material has lain in place.

About 3 percent of the land consists of comparatively high plains or benches which have not been greatly dissected by erosion, and the Red Bay, Orangeburg, Ruston, and Marlboro soils occurring here are the most mature soils.

The fundamental characteristics of the red soils of the high plains are shown in the following description of a profile of Red Bay fine sandy loam, as observed in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 26, T. 2 N., R. 5 W.:

- 0 to 10 inches, brown loose fine sandy loam stained dark with organic matter.
- 10 to 16 inches, reddish-yellow loose fine sandy loam.
- 16 to 40 inches, deep-red friable light fine sandy clay.
- 40 to 90 inches, pinkish-red fine sandy loam which is slightly sandier than the material in the horizon above, becoming sandier with increasing depth.

The red soils (Red Bay and Orangeburg) are largely restricted to these high older plains and the brows of the slopes immediately around the edges of the plains. The development of red soils on these plains is accounted for by the thorough drainage and oxidation, as the deep substratum is very sandy and the heaviest parts of the soil horizons are pervious light sandy clays. In addition, the soil-forming agencies have been allowed to operate without interruption for a comparatively long time, as the plains constitute the older land surfaces and are not eroded. Small somewhat round depressions, similar to the lime sinks in southwestern Georgia, dot the surface of these plains, and a few of them hold water most of the year. In the immediate vicinities where these depressions are more common, Ruston and, in some places, Marlboro soils are likely to occur, and examinations of surrounding slopes indicate that the sand substratum is either missing or lies at a much greater depth than is typical.

Most of the Marlboro fine sandy loam occurs on Pine Level, a high bench west of Leakesville, which is only about 50 feet lower than the highest surrounding plains. Following is a description of a profile of this soil as observed in the center of sec. 9, T. 2 N., R. 6 W.:

- 0 to 2 inches, gray loose fine sandy loam stained dark with organic matter and containing many roots.
- 2 to 5 inches, yellowish-gray loose fine sandy loam containing less dark organic matter and few roots.
- 5 to 9 inches, grayish-yellow loose fine sandy loam.
- 9 to 28 inches, bright-yellow moderately sticky fine sandy clay which crushes readily and is friable when dry.

28 to 48 inches, yellow fine sandy clay containing faint splotches of gray and yellowish gray, which is slightly more friable than the material in the horizon above.

Examinations of deep cuts and slopes leading downward from the borders of this plain indicate that if it be underlain by a sandy substratum, such a substratum is much deeper here than is that of the plains on which the red soils have developed. This plain occurs at a lower level and is geologically younger than are most of the plains occupied by red soils, although at least three remnants of similar high benches, having approximately the same relative elevation as the Marlboro plain, have developed red soils. One of these is about 2 miles south of Hillman, and the other two are in the northeastern part of the county southwest of State Line. The red soils on these benches have more pervious or more sandy B and C horizons than the corresponding horizons of the Marlboro soils. This suggests that the development of red soils is less dependent on the age of the plains than on the quantity of sand in the B and C horizons, which, of course, provides free underdrainage.

Norfolk fine sandy loam occupies positions on the rolling or dissected drainage slopes. Its profile is, in essential characteristics, similar to that of the corresponding Marlboro soil. The principal differences between these two soils are that the B horizon of the Marlboro soil is slightly firmer and apparently contains a higher percentage of silt, clay, and colloidal materials, and the polished surfaces formed by plowing or auger borings take on a somewhat brighter gloss than the typical B-horizon material of the Norfolk soil. The A horizon, or the eluviated surface layers, of the Norfolk soil is several inches thicker than the corresponding horizon of the Marlboro soil. It is also noted that red splotches, consisting in part of segregated iron oxides, and cementation are more prevalent, or at least more apt to occur, in the upper part of the C horizon of the Norfolk soil. As these two soils are mapped locally, the various layers of the A horizon of the Norfolk soil have been more disturbed by erosion, which is incident, of course, to a difference in relief. An examination of the map reveals that in general the heavy soils outcrop on slopes below the Norfolk soils, indicating the absence of, or a very thin, sand substratum. Some exceptions occur where sandy soils are on such slopes, but the presence of most of these is explained by slope deposition of sandy colluvium.

The profiles of the heavy soils of the Ruston series differ from those of the Norfolk principally in that the B horizons of the Ruston soils are somewhat red and the C horizon contains a higher percentage of sand, the upper part of which typically shows less evidence of cementation than does that of the heavy Norfolk soils.

A representative profile of Susquehanna fine sandy loam, as observed in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T. 1 N., R. 7 W., is described as follows:

- 0 to 4 inches, gray loose fine sandy loam stained dark with organic matter and containing many roots.
- 4 to 12 inches, pale-yellow loose light fine sandy loam containing few roots.
- 12 to 24 inches, mottled whitish-gray, red, and yellow tough plastic fine sandy clay. On drying the material falls into hard cubes ranging from one-half to 1 inch in diameter.
- 24 to 40 inches, whitish-gray tight fine sandy clay containing bright splotches of purple and red.

This soil does not exhibit the fully developed regional soil profile, owing to the very heavy impervious character of the parent material and the thorough dissection of the terrane on which it occurs.

A part of Cuthbert fine sandy loam, as mapped in this county, is geographically closely associated with the Susquehanna soils, and it is also thought to be closely related in fundamental characteristics. This phase of the Cuthbert soil differs from the Susquehanna soil primarily in that a firm, less plastic brown layer containing very faint or no splotches and ranging from 6 to 10 inches in thickness, is developed immediately beneath the surface soil, or leached horizon. That is, this phase of the Cuthbert soil is apparently derived from materials similar to the parent materials of the Susquehanna soil, in which an advanced stage of development has taken place where erosion has not been so active as is typical of the Susquehanna soils.

Part of Cuthbert fine sandy loam, as mapped in this county, is geographically removed from the larger typical bodies of Susquehanna soil, and this phase is distinguished from the Susquehanna soil by broader differences in soil characteristics. The substratum is less plastic, less tough, and contains a higher proportion of sand, but it is nevertheless tight, or hard, and apparently slowly pervious to water. A close examination of one of the angular clods into which the material breaks when comparatively dry shows it to be honey-combed with minute openings.

The Susquehanna and Cuthbert soils occupy the rolling clayey lands, and erosion has been active during the period of their development.

The less youthful river-terrace soils are well represented by the fine sandy loam types of the Kalmia and Cahaba series.

Following is a description of a virgin profile of Kalmia fine sandy loam as observed in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 1 N., R. 6 W.:

0 to 8 inches, gray loose fine sandy loam stained dark with organic matter and containing some roots.

8 to 16 inches, pale-yellow loose light fine sandy loam containing few roots.

16 to 36 inches, yellow friable fine sandy clay.

36 to 50 inches, yellow light fine sandy loam splotched with light gray.

The character of the substratum differs widely from place to place and in many places is heavier in texture and only slowly pervious to water. In all places the upper soil horizon is much lighter in texture than the second horizon, and the second horizon, with a thickness ranging from 12 to 30 inches, is of uniform color, in contrast to the mottled appearance of the substratum.

The Cahaba soils are red in their B horizons, and they are characterized by better drainage to a slightly greater depth than are the Kalmia soils. This is because the Cahaba soils have developed along the deeper stream channels. To the extent that the Cahaba soils are better drained, they are also more thoroughly oxidized and further advanced toward a mature profile.

A generalized profile of the poorly drained soils shows the following layers: (1) A dark grayish-brown or brownish-gray thin surface soil; (2) a thin whitish-gray layer; and (3) a heavier textured grayish-brown layer splotched with one or more of the colors—yellow, brown, and red. In the heavier textured soils blue may also appear. In most places material similar to this continues to considerable depth.

The thickness of the organic covering, which consists of mucky material, ranges from only a trace to nearly 12 inches, and the texture and consistence range from incoherent grayish-white sand to heavy plastic silty clay loam.

The muck areas consist almost entirely of nearly black finely divided organic material which, the greater part of the time, is saturated. Muck occurs almost exclusively in narrow strips along small streams and drainageways, where seepage from the slopes is sufficient to maintain the saturated condition apparently necessary to its accumulation and preservation. More or less mineral materials are deposited in the muck by water action.

Table 5 shows the mechanical analyses of samples of several soils mapped in the county.

TABLE 5.—*Mechanical analyses of samples of several soils in Greene County, Miss.*

Soil type and sample no.	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
	<i>Inches</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Red Bay fine sandy loam:								
425610	0-10	0.4	6.8	15.7	30.6	10.1	24.5	11.8
425611	10-16	.3	3.7	13.6	40.8	11.0	17.8	12.8
425612	16-40	.2	3.2	11.6	34.4	10.0	16.4	24.3
425613	40-90+	.2	3.0	14.0	43.3	10.0	4.9	24.7
Orangeburg fine sandy loam:								
425614	0-10	.3	6.6	14.6	32.5	11.5	23.9	10.5
425615	10-18	.2	5.7	13.5	31.4	11.5	24.1	13.5
425616	18-42	.2	4.7	10.9	26.6	9.6	21.9	26.1
425617	42-56	.3	4.8	13.3	30.0	10.9	13.9	26.7
Ruston loamy sand:								
425658	0-6	.5	17.2	33.7	31.3	7.2	7.4	2.6
425659	6-40	.4	11.6	25.9	34.4	11.7	9.3	6.7
425660	40-52	.5	10.7	20.3	26.1	9.4	18.1	14.9
425661	52-78	1.1	13.7	25.3	32.2	9.7	12.6	5.4
Marlboro fine sandy loam:								
425653	0-2	.5	2.2	3.9	18.9	22.7	43.0	8.7
425654	2-5	.5	2.1	3.8	17.1	23.0	43.1	10.4
425655	5-9	.4	1.7	3.4	16.4	22.6	41.3	14.1
425656	9-28	.1	.9	2.3	13.6	18.6	36.2	28.2
425657	28-48	.1	.9	2.2	13.9	21.8	36.6	24.4
Norfolk fine sandy loam:								
425649	0-4	.2	3.0	6.9	17.6	20.2	45.1	6.9
425650	4-14	.1	2.1	5.5	15.4	17.7	44.2	15.0
425651	14-38	.4	3.0	5.8	13.7	12.3	38.5	26.2
425652	38-50+	.1	.9	4.3	15.0	13.7	31.9	34.0

SUMMARY

Greene County is in the southeastern part of Mississippi, about 45 miles from the Gulf of Mexico.

The surface relief is the product of a moderately deep and thoroughly dissected plain. About 30 percent of the area consists of first and second stream bottoms, about 3 percent of high plains, and the rest of rolling drainage slopes.

The uplands were formerly heavily forested with longleaf pine. This has been removed, and the land is left in a comparatively open cut-over condition.

The county was organized in 1811. The early white settlers established homes along Leaf and Chickasawhay Rivers 125 years ago. The 1930 census reported a population of 10,644. Leakesville, the county seat and largest town, had a population of 662 in that year. Timber and open-range livestock have afforded the principal sources of income during the history of the county.

Three railroads, two gravel-surfaced State highways, and a local system of sand-clay roads provide ample transportation to all sections. Churches, schools, mail routes, and villages are well distributed.

The climate is mild and favorable to the growth of widely diversified crops.

The original pine forest has been practically exhausted, and the county has necessarily entered on a new period of economic development. The outlook suggests an expansion in agriculture. The present income is derived principally through livestock, cotton, and truck crops, and to less extent from lumbering. Only about 3 percent of the land is cultivated, and most of the livestock are raised on the open range.

About 20 percent of the soils are considered suitable for crop production. The principal agricultural soils are the fine sandy loams of the Red Bay, Orangeburg, Ruston, Marlboro, Norfolk, Kalmia, and Cahaba series. The more sandy soils of these series and the fine sandy loams of the Susquehanna and Cuthbert series occupying rolling land, are in part droughty, and are very susceptible to severe erosion. They are adapted to reforestation with longleaf pine. The rest of the soils are poorly drained and may be properly devoted to either pasture or forestry.

Among other problems demanding consideration in the future agricultural development of Greene County are proper land utilization and measures necessary for soil conservation.



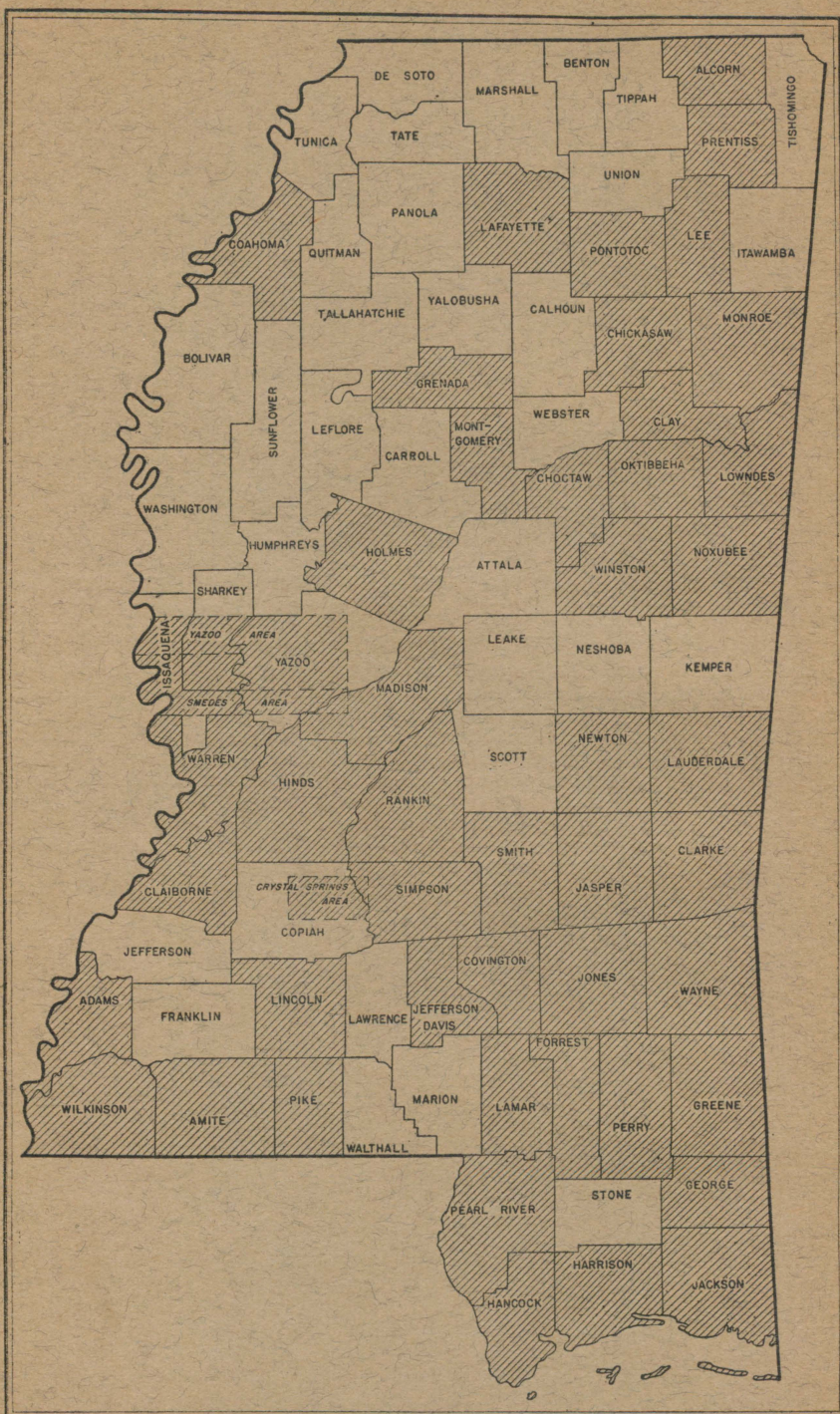


LEGEND	
Bibb silty clay loam Bc	Norfolk sand N
Blakely loam B	Norfolk loamy sand No
Cahaba loamy fine sand Cl	Norfolk sandy loam, Deep phase No
Cahaba fine sandy loam Cf	Norfolk fine sandy loam Ns
Cuthbert fine sandy loam Cu	Orangeburg fine sandy loam Om
Dunbar fine sandy loam Dr	Slope phase S
Grady very fine sandy loam Gv	Plummer loamy fine sand Ps
Kalmia sand Ks	Red Bay fine sandy loam Rf
Kalmia loamy fine sand Ka	Slope phase S
Kalmia fine sandy loam Kf	Ruston loamy sand Rl
Leaf fine sandy loam Lf	Ruston sandy loam, Deep phase Rd
Better drained phase Lf	Ruston fine sandy loam R
Marlboro fine sandy loam Mf	Rolling phase R
Myatt very fine sandy loam Mv	Sunquahanna fine sandy loam Sf
Ochlocknee fine sandy loam Of	
Ochlocknee silty clay loam Oc	Rough broken land Rb
Muck Mu	Swamp S

CONVENTIONAL SIGNS	
CULTURE (Printed in black)	
City or Village, Roads, Buildings, Wharves, Jetties, Breakwaters, Lighthouses, Forts	RAILROADS Steam and Electric R.R. crossings, tunnels
Secondary roads Trails and Pipe lines	School or Church Cemeteries
Bridges, Ferry Ford, Dam	Bluff Escarpment, Rock outcrop and Transposition station
Mine or Quarry Mine dumps Made land	Soil boundaries
Stony and Gravelly areas	Boundary lines
County Boundary lines	U.S. township and section lines
RELIEF (Printed in brown or black)	
Contours Depression contours	Prominent hills Mountain peaks
Sand, Wash, and Sand dunes	Shore and Low-water line, Sandbar
DRAINAGE (Printed in blue)	
Streams	Lakes, Ponds, Intermittent lakes
Intermittent streams	Spring, Canals, and Ditches, Flumes
Swamp, Salt marshes	Submerged marsh Tide flats

Authority for printing soil survey reports in this form is carried in the Appropriation Act for the Department of Agriculture for the fiscal year ending June 30, 1933 (47 U. S. Stat., p. 612), as follows:

There shall be printed, as soon as the manuscript can be prepared with the necessary maps and illustrations to accompany it, a report on each soil area surveyed by the Bureau of Chemistry and Soils, Department of Agriculture, in the form of advance sheets bound in paper covers, of which not more than 250 copies shall be for the use of each Senator from the State and not more than 1,000 copies for the use of each Representative for the congressional district or districts in which a survey is made, the actual number to be determined on inquiry by the Secretary of Agriculture made to the aforesaid Senators and Representatives, and as many copies for the use of the Department of Agriculture as in the judgment of the Secretary of Agriculture are deemed necessary.



Areas surveyed in Mississippi shown by shading. Detailed surveys shown by northeast-southwest hatching.