Series 1935, No. 18 Issued March 1941

Soil Survey

Sumter County Alabama

By

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United States Department of Agriculture
and
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ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

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SOIL SURVEY OF SUMTER COUNTY, ALABAMA

By G. A. SWENSON, in Charge, A. C. ANDERSON, W. I. WATKINS, B. H. WILLIAMS, CLARENCE LOUNSBURY, and R. R. FINLEY, Soil Survey Division,[1] Bureau of Chemistry and Soils, United States Department of Agriculture, and L. G. BRACKEEN, M. E. SWANN, and HOYT SHERARD, Alabama Department of Agriculture and Industries

Area inspected by W. EDWARD HEARN, Inspector, District 2

United States Department of Agriculture in cooperation with the Alabama Department of Agriculture and Industries

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COUNTY SURVEYED

Sumter County is in the west-central part of Alabama (fig. 1). The Alabama-Mississippi State line forms its western boundary, and the Tombigbee River, with its large irregular bends, forms its eastern

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

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boundary. Pickens and Choctaw Counties, respectively, border it on the north and south. The distance from north to south is 47 miles, and the distance from east to west ranges from 8 miles near the northern boundary to 32 miles in the south-central part. Livingston, in the central part, is about 105 miles southwest of Birmingham, 110 miles west of Montgomery, and 130 miles north of Mobile. The area of the county is 908 square miles, or 581,120 acres.

This county lies within the physiographic division known as the Gulf Coastal Plain. The original topographic features were those of a nearly flat, gently sloping, or undulating coastal plain. A deep layer of unconsolidated stratified sands and clays or sandy clays overlay beds of soft limestone or semi-indurated clay. Erosion, principally water erosion, has cut away the surface layer in most places, leaving only a few small remnants.

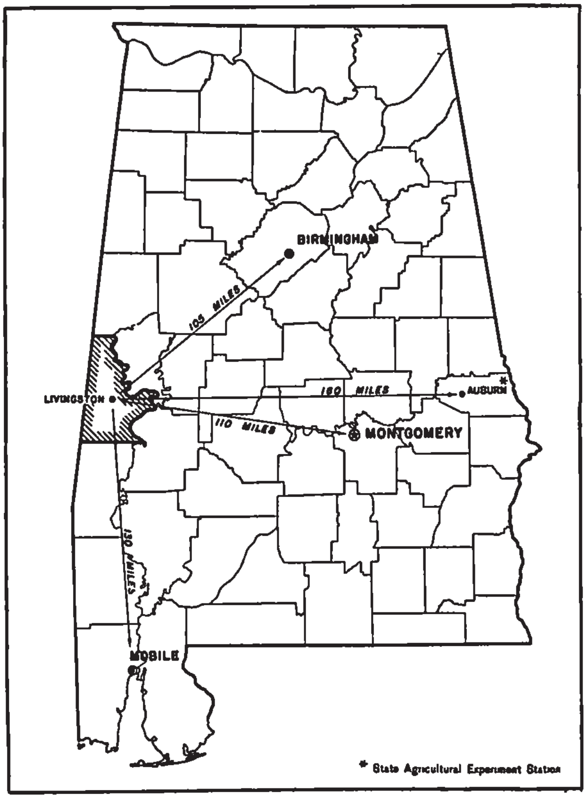

FIGURE 1.—Sketch map showing location of Sumter County, Ala.

A fairly accurate idea of the distribution, general location, and approximate extent of the four main topographic divisions can be gained by referring to the topographic sketch map (fig. 2).

The first division occupies the major divides and includes the highest ridges and plateaus. It is in this division that the remnants of the original sandy covering occur. The largest area of this division, and one that probably includes the highest elevations in the county, extends from Belmont in a northwesterly direction beyond Sumterville, but the remnants of the deep sandy covering, locally known as sand hills, extend only a few miles north and northwest of New Prospect Church. Others areas are northwest of York and southeast and north of Cuba. A small area is northwest of Boyd. Except for the small plateaus and wider ridge tops, the relief is rough and broken. The elevation, which generally ranges from about 300 to 440 feet above sea level, drops rapidly to the intervening valleys lying from 100 to 200 feet lower. For the most part, the stream divides are narrow and irregular and have gently rounded ridge tops. In places the small plateaus and wider ridges form comparatively important, although not extensive,

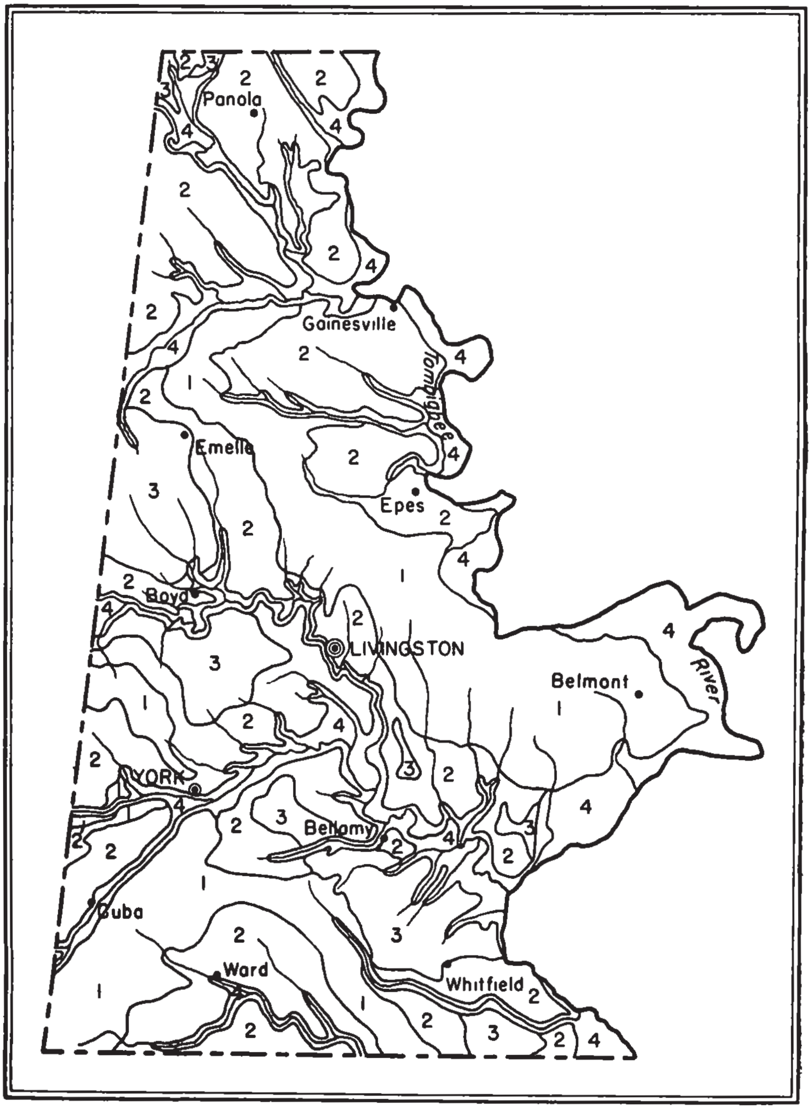

FIGURE 2.—Sketch map showing main topographic divisions of Sumter County, Ala.: 1, Rolling, rough, and broken uplands; 2, undulating to rolling uplands; 3, gently undulating to gently sloping uplands; 4, flat to undulating first and second bottoms.

farm areas. Many of the breaks from the higher and smoother areas are steep and blufflike, and the surrounding country is rough, broken, and of little or no agricultural value.

The second division comprises most of the uplands with rolling to undulating relief and the higher terraces or second bottoms. It occupies the broad areas below the major divides, or those bordering on the true flatwoods, and is distributed more or less evenly throughout the county. The soils are principally the so-called prairie soils and sandy soils developed from redeposited material. In places, soils, locally known as the sandy flatwoods, are included in this division because of the impossibility of separating them from the bordering sandy soils on a map of the scale used. The so-called sandy flatwoods otherwise would be included in the third division. The prairies occupy most of the area north and east of an imaginary line drawn from a point on the Mississippi State line about a mile south of where Bodka Creek enters Sumter County, passing just northeast of Emelle and Livingston in a southeasterly direction to the Tombigbee River near Pace Landing, except the areas included in the first and fourth divisions. The elevation of this division ranges from 120 to 250 feet. Surface drainage generally is good. The proportion of tilled land is higher than in the other divisions.

The third division presents a flat to gently sloping or gently undulating relief. It occurs chiefly in a belt extending southeast and northwest through the south-central part of the county. Some of the areas within this division are called flatwoods, and the soils are clays and silty clays. With the exception of the area just south of Emelle, most of which is cultivated, the greater part of this division is in forest. The elevation ranges from 120 to 200 feet. Surface drainage ranges from fair to poor, and internal drainage is poor.

The fourth division includes the bottom lands, which are subject to overflow, and the low terraces or second bottoms. The areas border the Tombigbee River, the smaller rivers, and the larger creeks. The land is flat, gently sloping, or gently undulating. The elevation ranges from less than 100 to more than 200 feet, and surface drainage ranges from good to poor.

The highest point in the county, more than 440 feet above sea level,[2] is in sec. 7, T. 18 N., R. 1 E. The elevation of the Alabama Great Southern Railroad at Cuba is 210 feet, at York 150 feet, and at Epes 120 feet. It is estimated that the divide northwest of York and the high points in the southwestern part of the county reach an elevation of approximately 400 feet. The elevation of the Southern Railway bridge at McDowell is 92 feet. The highest hilltops in Sumterville are just above 300 feet. The elevation of the so-called prairies is generally less than 250 feet, but where the prairies join the major divides the elevation of the chalk formation may exceed 300 feet.

Sumter County lies wholly within the drainage basin of the Tombigbee River. The Noxubee River, Factory Creek, and Jones Creek in the northern part, the Sucarnoochee River and Spring Creek in the south-central and southeastern parts, and Cotohaga and Kinterbish Creeks in the southern part are the main tributaries of the Tombigbee. They carry most of the run-off into the river, and the rest is carried directly into the river by small creeks and short lateral drains. Several of the larger tributaries of the river rise in Mississippi and flow in an easterly or southeasterly direction through the county. Kinterbish Creek is the only important tributary that does not reach the river within the county.

[2] UNITED STATES GEOLOGICAL SURVEY. Epes Quadrangle

Stream dissection is fairly thorough throughout, except in the flatwoods section, where the smaller streams are not well defined. Surface drainage is good on most of the uplands, excessive in places along the major divides, and fair to poor in the flatwoods, the bottom lands, and on some of the flatter stream and river terraces. In general the streams are slow flowing, except in the more hilly sections, where run-off is rapid. The larger streams have reached fairly permanent base levels, which lie only slightly higher than the bed of the Tombigbee River. Their beds are cut into the underlying soft limestone or semi-indurated clays. Nearly all of the streams have developed comparatively broad flood plains, or first bottoms, and stream terraces, or second bottoms, that are subject to inundation during extremely high stages of the streams. The first and second bottoms range from 1 to 3 miles in width along the Noxubee River, from 1 to 2 miles along Bodka Creek, and are less than a mile wide along other streams. Well-drained to swampy alluvial areas, which are more than 2 miles wide in places and entirely absent or very narrow in others, occur along the Tombigbee River. The river bed has cut into the Selma chalk formation, and the banks rise nearly perpendicular to a height ranging from 25 to 60 feet above low-water level.

The entire county, except the areas occupied by the calcareous prairie soils, is well covered with forest. The sandy uplands and terraces support dense growths of shortleaf pine, longleaf pine, and scattered hardwoods of post oak, red oak, black oak, hickory, sweetgum (red gum), black gum, and some poplar. The flatwoods, the post oak prairies, the poorly drained flat terraces, and the wide flat bottom lands are forested largely with post oak, together with other oaks, sweetgum, hickory, elm, gums, hackberry, and pines. The calcareous prairies have a scattered growth of hackberry, walnut, elm, ash, and cedar and an undergrowth of briers and plum trees, but grasses and briers predominate.

Good drinking water generally can be obtained throughout the county. In the sandy or sandy clay areas of the southwestern part, the sand hills east of Livingston, and in the areas where the Selma chalk or the Sucarnoochee clay formations are covered by fairly deep redeposits of sandy clay material, water for household use can be obtained from shallow dug wells in most places. In the Selma chalk area, rain water from the roofs is collected in deep cisterns or wells dug into the chalk, and it is stored for household use. On the larger farms where many livestock are kept, it is frequently necessary to sink wells through the chalk formation, in order to obtain water. Most of such wells, where the elevation is less than 180 feet above sea level, are flowing (artesian) wells. The water obtained from these wells ranges from slightly salty to highly mineralized. The depth of the wells ranges from a few hundred feet in the northern part to more than 900 feet near Livingston. The artesian well water is used also for drinking water and for household use. In some areas springs are common, and the people, especially tenants in the neighborhood, obtain most of their water for household use from them.

Sumter County was created by an act of the State legislature in 1832. The section including this county was acquired by the treaty of Dancing Rabbit Creek with the Choctaw Indians, September 27, 1830. In 1847, Townships 14 N. and 15 N. were taken from it and added to Choctaw County. Sumter County was named for Gen.

Thomas Sumter, of South Carolina, a soldier in the American Revolution. The Indians had four main settlements within the present borders. Quilby, Bodka, and Alamuchee settlements were located near the creeks now bearing these names; and the fourth was about 6 miles east of Quilby at the headwaters of Factory Creek. The Choctaw name of this town has been lost, but the Indians inhabiting it were called Pickbone Indians. Most of the Choctaw Indians migrated in 1831 to reservations farther west.

The early white settlers purchased their lands in 1831 and 1832. Livingston was laid out as the county seat in 1833. Most of the settlers came from the South Atlantic States, especially from the central and eastern parts of North Carolina.

The Federal census of 1930 reports a population of 26,929, all classed as rural. It includes 5,659 native-born whites, 21,247 Negroes, and 23 foreign-born whites. The largest towns are Livingston with a population of 1,072 and York with 1,796. Cuba, York, Livingston, and Epes on the Alabama Great Southern Railroad; Curl, Lilita, Coatopa, and McDowell on the Southern Railway; Ward, Boyd, Emelle, Geiger, and Panola on the Alabama, Tennessee & Northern Railroad; and Bellamy and Whitfield on the Sumter & Choctaw Railway are local markets and shipping points. The largest town having no railroad connections is Gainesville with a population of 329. It was formerly very important as a shipping point for river traffic. Sumterville, Hamner, Warsaw, and Belmont are small inland settlements and trading points of local interest.

The railroads are so distributed that all parts of the county have fair access to shipping points. The more important products shipped are cotton from all parts; truck crops, principally from Cuba; beef cattle and turkeys, mostly from the prairie sections in the northern and eastern parts; and lumber from Bellamy, York, Livingston, and other points. The principal outside markets for farm products are Birmingham, Montgomery, Mobile, and places farther north and east.

United States Highway No. 80 is paved from the Mississippi State line through York and Livingston to Memorial (Rooster) Bridge. United States Highway No. 11 is paved from Livingston for about 7 miles toward Epes, and the rest of the road is graded and graveled. A graded and graveled State highway extends from United States Highway No. 11 to Gainesville. Other roads are lightly surfaced with gravel and sand or sandy clay, but they have been improved greatly during the last few years.

Very few telephone lines are in the rural districts, but the more important towns have telephone systems and service connections with other towns. Rural mail routes reach practically all parts. Churches and schools, for both white people and Negroes, are well distributed in the rural sections and in the towns. A State teachers college for white people is at Livingston, and consolidated high schools are at York, Livingston, Cuba, and Ward. Schools for higher education for Negroes are at York, Livingston, Hamner, Zion, Pine Grove, and Mount Tabor.

Lumbering has been more or less important from the early history of the county to the present time. Prior to the twentieth century most of the forest products were used locally, and many plantations had their own sawmills. Between 1900 and 1930 the increased demand for lumber products in the industrial centers to the north and northeast began to take a large part of the lumber from the South. At that time there were large areas of virgin timber in Sumter County. Several fairly large sawmills and planing mills were built, and many small portable sawmills were used. The products from these mills were shipped to various markets and sold, some as far north as Chicago. Today the virgin timber is practically gone, but, owing to the practice adopted by some of the local lumber companies, the new growth more than equals the average annual cut. Upland game preserves for deer and wild turkeys have been established on the timberlands of the larger lumber companies.

CLIMATE

The climate of Sumter County is mainly continental. It is influenced, however, by oceanic breezes at times. The range of temperature between the extremes of the hottest days of summer and the coldest days of winter is fairly wide, but the difference between the mean temperatures of these two seasons is only about 31° F. The winters are mild and normally pleasant, although periods of cloudy and rainy weather occur occasionally. Chilly spells with freezing weather lasting from a few days to more than a week may be expected at intervals during the winter, but very cold weather is rare. Sleet and snow are rare and of short duration. The summers are long and sometimes hot, but generally they are tempered by cooling breezes, especially at night. The spring and fall seasons ordinarily are free from extremes of heat or cold.

No Weather Bureau station is maintained in Sumter County, but statistics from the station at Pushmataha, Choctaw County, are considered representative. The date of the average last killing frost is March 24 and that of the first is November 8, giving an average frost-free season of 229 days. Frost has been recorded as late as April 26 and as early as October 21. There is some slight variation in the length of the growing season on the higher uplands and the flat lowlands.

The annual rainfall, which averages 57.39 inches, generally is well distributed throughout the year, especially during the growing season. September, October, and November are the driest months and are, therefore, more favorable for the maturing and gathering of the staple crops—cotton and corn. The rainfall generally is sufficient for the production of crops. Periods of excessive rain or drought occur at times and may do considerable damage, but they never have caused a total loss of crops.

The climate is favorable for diversified farming. The long growing season favors the production of a large variety of crops, and the winters are mild enough for winter cover crops to be grown successfully. The soil seldom freezes to a depth of more than an inch or two and remains frozen only a few hours or at most a few days. Plowing can be done practically all winter whenever the soil is not too wet. Such hardy vegetables as turnips, cabbage, and collards generally can be grown during the winter. Beets, lettuce, onions, and radishes can be produced in the gardens during the late fall and early spring, but these crops occasionally are killed by hard freezes. Because of favorable spring weather, early truck crops and some berries are produced for the northern markets. Native and introduced grasses thrive in the pastures and have a growing period of about 10 months. This makes the section favorable for dairying and livestock farming. The section of the Gulf Coastal Plain in which Sumter County is located is subject to occasional severe windstorms, hailstorms, and tornadoes. These storms occur most commonly in February, March, April, and May. They are less frequent in October and November and have occurred during other months.

Table 1, compiled from the records of the United States Weather Bureau station at Pushmataha, Choctaw County, gives a fair representation of climatic conditions in Sumter County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Pushmataha, Choctaw County, Ala.*

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1904)	Total amount for the wettest year (1929)
	°F.	*°F.*	*°F*	*Inches*	*Inches*	*Inches*
December	48.9	83	9	5.97	5.55	3.34
January	48.6	81	10	5.50	4.09	8.07
February	50.4	86	−7	5.83	6.08	10.50
Winter	49.3	86	−7	17.30	15.72	21.91
March	57.9	93	19	5.41	3.16	18.04
April	64.4	93	28	4.75	3.22	4.85
May	71.9	98	38	4.82	2.26	6.10
Spring	64.7	98	19	14.98	8.64	28.99
June	78.6	102	50	4.66	3.19	4.49
July	80.6	106	54	5.14	5.27	3.37
August	80.2	108	55	4.81	3.85	1.47
Summer	79.8	108	50	14.61	12.31	9.33
September	76.1	104	37	3.79	.69	5.72
October	65.2	98	26	2.85	.13	3.31
November	55.3	88	18	3.86	3.29	12.09
Fall	65.5	104	18	10.50	4.11	21.12
Year	64.8	108	−7	57.39	40.78	81.35

AGRICULTURAL HISTORY AND STATISTICS

The agricultural history of Sumter County began with the coming of the white settlers about 1831. A trading post had been established before this time near the Tombigbee River by Gaines & Glover, who had a store or factory, as it was called, on a creek that later became known as Factory Creek. The settlers, who came in 1831 and 1832, purchased and settled on their lands at widely scattered places. By the end of 1832, settlements had been made at several points on Bodka Creek, extending as far west as the State line, on Factory and Cedar Creeks, and at Gainesville, Sumterville, Belmont, Livingston, Jones Bluff, and elsewhere.

The earliest type of agriculture did not differ greatly from that practiced by the Indians. It consisted of the production of corn and potatoes for home use. The settlers depended on wild game, which was then plentiful, for their supply of meat. Garden vegetables, grains, and some domestic livestock and poultry were introduced early. By 1840 the production of cotton was receiving considerable attention, and cotton was already the principal cash crop. A number of large plantation homes were built during the 1830's and 1840's, several of which are still in use. By 1860 many large plantations were in full operation under slave labor. On most plantations the number of slaves ranged from 50 to 500, and, according to local reports, several plantation owners had more than 1,000 slaves each.

Transportation was chiefly by water. The Tombigbee River offered excellent connections with outside markets. Cotton was brought to the river ports and landings direct from the plantations, overland by wagons, or down the small tributaries by boats and rafts. It was then shipped by river steamers to outside markets, where it was sold for cash or exchanged for supplies. Some planters made regular trips by steamboat once or twice a year to the outside markets to sell their cotton and buy their own supplies. The county was rich in timber, but lumbering did not become important, except for local use, until later. Many planters had their own sawmills and cut the lumber they needed, but much excellent timber was destroyed when the land was cleared for cultivation.

By 1830 the people of Perry, Dallas, and other counties in the prairie belt had learned that cotton, corn, and various other crops could be grown successfully on what they called the black prairie soils, or the Black Belt. The black prairie soils were some of the first to be bought and opened for cultivation. They were extensively used for the production of cotton and corn. Under intensive cultivation these soils were subjected to very severe sheet erosion and gullying because they were underlain by an impervious layer of soft limestone. It is presumed that under the plantation system, with slave labor, these destructive agencies were more successfully combated; but under the tenant system, later introduced, erosion became so destructive that large areas of once productive land were abandoned. The abandoned land was used more and more for pasturing livestock, especially beef cattle.

After the Civil War the status of labor was so greatly changed that the plantation system was no longer entirely successful. Most of the land continued to be held in large holdings but was operated under the tenant system. Very little change was made in the crops grown, and the production of row-cultivated crops without the close supervision of the planter or his overseers exaggerated the destructive forces of erosion. Most of the land still is in large holdings acquired in later years, nearly all of which are operated by tenants. In the prairie or mixed prairie sections some large holdings, as well as smaller ones, are used almost exclusively for raising livestock. They are operated by the owners or by the owners with the help of a few tenants.

Before the infestation of the boll weevil, the most desirable lands for the production of cotton were the heavy clay and silty clay soils of the prairies, the flatwoods, and the bottom lands, because these heavy soils would produce fair to good yields of cotton without the use of any fertilizers, or, in places, with the use of a side dressing of nitrate of soda. The sandy soils, although used for the production of cotton when fertilized, were not considered good soils for cotton. After the advent of the boll weevil, in 1914, some very important and lasting changes occurred in the agricultural practices, especially in the use of both the sandy and the clay or silty clay soils of the Southern States. From the first, the damage to cotton was very great, especially on the heavy soils, but as the planters became more accustomed to the habits of the boll weevil, they learned that if the cotton crop could be matured early a good share of it would escape damage. The heavy soils remain wet longer in the spring, warm more slowly, and produce a larger and more leafy stalk than do the sandy soils. Therefore, the cotton crop on the heavy soils comes into fruiting much later than the crop on the sandy soils and at a time when the boll weevils are most numerous. On the other hand, by the liberal use of fertilizers, the sandy soils can be made to produce a fairly satisfactory crop that matures early enough to escape much damage from weevils. Many areas of the heavy soils were thrown out of use entirely; but after a grass cover had established itself, especially on the calcareous prairie soils, and the flat bottom lands, they were added to the hay and pasture lands.

Another important change in the agriculture of the county came with the increased demand for fresh vegetables in the larger centers of population, together with improved facilities for marketing such crops from greater distances. Many large areas of sandy land, previously used chiefly for the production of cotton, were planted to truck crops and to strawberries. These crops are harvested in the spring and early summer and shipped by rail to northern markets. According to the county agent, from 10 to 12 carloads of crated beans are shipped annually. Peas and cabbage are marketed by truck. Cabbage is considered a catch crop, which depends on the weather and other conditions, and it occupies from 2 to 60 acres a year. The average acreage in strawberries is 20 acres. When the demand for truck crops and strawberries was better, these crops were grown on a much larger acreage near Cuba. The areas were extended to York and Livingston, and to some extent to the northern part of the county near Geiger.

Table 2, compiled from the Federal census reports, shows the trend of agriculture since 1879.

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

Crop	1879	1889	1899 [1]	1909	1919	1929 [1]	1934 [1]
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
Cotton	80,662	82,657	97,536	80,494	52,048	59,092	34,204
Corn	51,402	45,808	59,051	41,914	38,265	34,167	46,671
Hay	132	677	790	4,985	9,991	5,189	17,824
Oats (threshed)	2,706	2,109	913	981	153	155	197
Sugarcane	32	376	473	543	289	205	460
Sorghum	----------	641	342	494	1,840	924	----------
Sweetpotatoes	1,056	1,079	997	744	1,728	1,391	2,262
Potatoes	----------	21	230	320	105	51	115
Peanuts	----------	113	232	509	3,523	1,211	3,170
Dry peas	----------	----------	1,485	1,482	1,855	706	3,400
Dry edible beans	----------	----------	11	43	11	185	165
	Trees	*Trees*	*Trees*	*Trees*	*Trees*	*Trees*	*Trees*
Peaches	----------	1,427	15,296	29,580	7,987	3,604	12,686
Pecans	----------	----------	161	215	1,042	15,131	----------

[1] The numbers of trees are for the years 1900, 1930, and 1935, respectively.

The United States census of 1880, based on the crop year of 1879, reports cropland, including fallow land, as 172,100 acres, of which 80,662 acres were devoted to cotton, producing 22,211 bales, and 51,402 acres to corn, producing 699,833 bushels. The production of cotton and corn reached its peak in 1899, when 97,536 acres were in cotton and 59,651 acres in corn, which produced 31,906 bales and 856,830 bushels, respectively. The destruction caused by the boll weevil is apparent in the small cotton crop of 1919, when 52,048 acres produced only 7,419 bales. In 1899, 790 acres were in tame and wild hay. Cropland, including 20,526 acres of fallow land, covered only 123,979 acres in 1934, of which 34,204 acres were devoted to cotton, 46,671 acres to corn, and 17,824 acres to tame and wild hay, producing 10,635 bales, 670,588 bushels, and 17,796 tons, respectively. The production of oats declined from 2,706 acres in 1879 and 2,109 acres in 1889 to 197 acres in 1934.

The growing of pecans and peaches has become important in recent years. In 1930 there were 15,131 bearing pecan trees, which produced 24,291 pounds of nuts in 1929, and 3,604 bearing peach trees, which produced 1,472 bushels of fruit. The number of peach trees increased to 12,686 in 1935, and the production in 1934 was 17,064 bushels. Pecans were not reported by the 1935 census.

Table 3 gives the number of livestock in census years.

Table 3.—*Number of livestock on farms in Sumter County, Ala., in stated years*

Livestock	1880	1890	1900	1910	1920	1930	1935
Horses	2,770	3,290	4,777	4,126	3,883	2,570	2 135
Mules	4,204	4,172	5.179	5,204	4,335	6.145	5,304
Cattle	15,843	18,783	20,158	21,325	26.819	24,191	29,920
Swine	26,311	29,750	29.818	21,728	23.209	13,422	16,432
Sheep	4,137	2,806	1,947	2,201	2,682	1,077	1,006
Goats	----------	----------	1,649	1.467	3.828	970	988
Poultry	[1] 84,102	118,942	97,326	72,839	77,060	[1] 67,080	87,409

[1] Chickens only.

No definitely comparable figures can be given for the livestock industry, because the number of cattle sold annually is not shown. In 1920 the numbers of cattle kept for beef production and for dairy purposes were about equal. Since then there has been a decided decrease in the number of dairy cattle and an increase in the number of beef cattle. The decline from 1920 to 1930 was in dairy cattle. Almost all of the increase in the number of cattle from 1930 to 1935 represents cows and heifers 2 years old and over. Part of this increase can be credited to the increase in breeding stock, but some of it must be attributed to the fact that many cattle were not sold in 1934, owing to the very low prices offered, but were held over for the 1935 season in expectation that prices would be better. In 1929, 5,599 cows were milked and produced 1,428,365 gallons of milk. The value of dairy products sold was $45,472. The principal items sold were 67,918 pounds of butterfat, valued at $29,205, and 41,852 gallons of whole milk, valued at $12,137. In 1934, 6,662 cows were milked and produced 1,400,154 gallons of milk.

The poultry raised and eggs produced in 1929 were valued at $215,308. The 133,347 chickens raised were valued at $89,432 and the 6,388 turkeys at $18,206. Somewhat less than one-fourth of the chickens raised are sold. The county agent estimates that from 6 to 10 carloads of live turkeys are shipped by rail or carried by truck, annually, from Sumter County to Birmingham and other nearby markets or to markets farther north and east. The 368,401 dozen chicken eggs produced in 1929 were valued at $106,836, of which about one-third were sold. In 1934, 124,593 chickens and 4,800 turkeys were raised and 261,902 dozen eggs were produced.

The use of commercial fertilizers is becoming more and more common. In 1919, 516 farms reported the purchase of fertilizers at a cost of $43,908; and in 1929, 2,253 farms reported $179,763 paid for fertilizers. The county agent states that about 25 percent of the fertilizer is mixed at home. The most popular ready-mixed fertilizers are 4-8-4,[3] 3-8-3, and 6-8-4. Except for the small quantity used in the production of commercial truck crops, practically all of the complete fertilizers are used in the production of cotton. About 5 percent of the farmers use winter legumes, usually vetch or Austrian Winter peas, as cover crops or green manures. The amount of seed used for these purposes increased from 30,000 pounds in 1930 to 105,000 pounds in 1934.

The supply of farm laborers, mostly Negroes, is ample to meet the demand for labor. On an average, those farmers who use extra labor during the busy season employ it for about 7 months. Wages have been very low since 1930, but they showed a decided upward trend in 1934 and 1935 over those paid in 1933 and 1934.

The census for 1935 gives the following sizes of farms: 32 percent contain less than 20 acres, 42 percent from 20 to 49 acres, 19 percent from 50 to 174 acres, and 5 percent from 175 to 499 acres; and the remaining 2 percent includes 58 farms between 500 and 999 acres in size and 39 farms of 1,000 acres or more. This percentage includes about one-third of the total land in farms. In addition there are large holdings of timberland owned by lumber companies or private persons. There has been a gradual decrease in the percentage of land held in farms. In 1880, 76.1 percent of the total area was in farms, but in 1935 only 57.9 percent was included. The most rapid drop was between 1920 and 1930, when it fell from 62.2 percent to 50.5 percent, because of the large amount of land abandoned and allowed to revert to forest. During this period many people left the farms for work in the industrial centers or at neighboring sawmills. The average number of acres per farm decreased from 151 in 1880 to 66.6 in 1930. This decrease was temporarily checked during the World War, when all available land was put into the production of crops, in order to supply the demand and to take advantage of the prevailing high prices. The 1935 census report gives the largest number of farms—4,697—operated since 1900 and an increase in the average size of farm to 71.7 acres. This change is due to the back-to-the-farm movement after the depression reached the industrial centers in 1929.

According to the Federal census of 1935, 19 percent of the farms were operated by owners, 80.8 percent by tenants, and 0.2 percent by managers. There were 763 white and 3,934 colored operators. At

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

the present time, based on information furnished by the county agent, about 50 percent of the sharecroppers rent for one-half of the products, where the owner furnishes the land, equipment, seed, and one-half of the fertilizer and the tenant furnishes the labor, one-half of the fertilizer, and, under some arrangements, part of the equipment; 10 percent rent under a third-and-fourth contract, that is, the landlord receives one-third of the cotton and one-fourth of the corn; and about 40 percent rent under special arrangements whereby they pay the landlord a specified number of pounds of lint cotton an acre or a specified number of bales of cotton for a certain piece of land per year, regardless of the crop yield or the price the cotton brings. In general, good fairly level sandy uplands, well-drained sandy second bottoms, tillable black prairie, gray limy prairie, and red and yellow prairie lands rent for about $2.50 an acre, rolling tillable uplands and tillable bottom lands for $1.50 to $2, and pasture lands from 50 cents to $1, depending on productivity and water facilities. These rents are from 50 cents to $1.50 less an acre than those paid in better times.

Most of the farms operated by the owners have good dwellings. The larger farms have barns and sheds for the livestock and are fairly well to well equipped with farm implements and machinery. Some of the buildings have electric lights and running water. On the tenant farms, as a rule, the buildings are poor and the farm equipment is simple. A few farms have equipment, such as tractors, tractor plows, harrows, and disks, but most farmers depend on mules, horses, and work cattle for draft power. The use of power machinery is increasing. Most of the mules and horses are brought into the county and sold to the farmers, as only a few are raised locally.

SOIL SURVEY METHODS AND DEFINITIONS

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

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures, such as those in road or railroad cuts, are studied. Each excavation exposes a series of distinct soil layers or horizons, called, collectively, the soil profile. Each horizon of the soil, as well as the parent material beneath the soil, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone, are noted. The reaction of the soil[4] and its content of lime and salts are determined by simple tests. The drainage, both internal and external, and other external features, such as the relief, or lay of the land, are taken into consideration, and the interrelation of the soil and vegetation are studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. On the basis of these characteristics, soils

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

are grouped into classification units. The three principal units are (1) series, (2) type, and (3) phase. In places, two or more of these principal units may be in such intimate or mixed pattern that they cannot be clearly shown separately on a map but must be mapped as (4) a complex. Areas of land, such as coastal beach or bare rocky mountainsides, that have no true soil are called (5) miscellaneous land types.

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

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

A phase of the soil type is recognized for the separation of soils within a type which differ from the type in some minor soil characteristic which has, nevertheless, an important practical significance. Differences in relief, stoniness, and the degree of accelerated erosion frequently are shown as phases. For example, within the normal range of relief for certain soil types, some parts are adapted to the use of machinery and the growth of cultivated crops and other parts are not. Even though no important differences can be traced in the soils themselves or in their capabilities for the growth of native vegetation throughout the range in relief, important differences may exist in their capabilities for the growth of cultivated plants. In such instances, the more sloping parts of the soil types are segregated on the map as sloping or hilly phases. Similarly, soils having differences in stoniness are mapped as phases, even though these differences are not reflected in the character of the soil or in the growth of native plants.

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

SOILS AND CROPS

The soils of Sumter County include a large number of distinct soil types, which differ widely in texture, structure, chemical composition, moisture, and natural productiveness. There are some large bodies of comparatively uniform soils, but, in general, the individual types are developed in small bodies and in complex associations. In many places, abrupt changes in texture and other soil characteristics occur within short horizontal distances, although the different soils exhibit the usual intergradations. The variable character and the number of distinct soils are attributed to the great variety of topographic forms, to the natural drainage, and to the amount of erosion that has taken place.

Five main geologic formations, Selma chalk, Sucarnoochee clay, Naheola, Tuscahoma sand, and Hatchetigbee, cross or enter the county in a northwest-southeast direction. These geologic formations, which are discussed in detail in the section on morphology and genesis of soils, have a direct influence on the soils.

The soils have been developed in a warm temperate and humid climate under forested conditions, except the calcareous prairie soils which, predominantly, have developed under a grass and brier vegetation. A soil developed in a humid climate under forest cover generally is acid and has a light-colored surface soil with a much heavier textured subsoil. The subsoil is somewhat heavier than the underlying soil material from which the soil is developed, especially where internal drainage has been good. In the poorly drained swampy lands the surface soils range from gray to black, depending on the quantity of organic matter accumulated. In the grasslands of the calcareous prairie soils the surface soil in general is dark, unless erosion has kept pace with the soil-forming agencies, and the surface layer is merely an accumulation of soil material consisting largely of partly weathered or crumbled Selma chalk.

The agriculture practiced shows to some extent a relationship between the soil and the crop or product produced. The farms that include calcareous soils formed from the soft limestone, or a fair proportion of them, produce most of the beef cattle, dairy products, and hay; those that include well-drained sandy uplands or well-drained sandy second-bottom lands are principally cotton farms; and those that include large areas of flat fairly well drained bottom lands and low-lying medium well drained second bottoms produce corn mainly. All tillable lands, however, are used to greater or less extent for the production of cotton and corn. Cattle are pastured on bottom lands and woodlands that are not influenced by the lime formation, although not so extensively as in the prairie sections. Most of the heavy flatwoods and the flat poorly drained sandy lands bordering them are kept in forest.

Prior to the infestation of the boll weevil, cotton was grown principally on the calcareous prairie soils, the heavy post oak prairie soils, and the sandy soils; but since that time many of the true prairie areas have been turned into pasture lands or when cultivated have been devoted largely to the production of hay, corn, and other feed crops for livestock. The soils of the heavy flatwoods are principally in forest; but here and there, especially south of Emelle, large tracts of Lufkin clay and Eutaw clay are in cultivation, principally to cotton. Corn is grown to some extent on them with fair success. New areas of the heavy clay lands have been opened very recently, but the areas of Lufkin clay selected for cultivation generally have more favorable relief than do the uncultivated areas. Cotton is said to grow very well on these soils during average years but may return rather small yields during wet years. The forested areas support mainly post oak, but there are also scattered growths of other oaks, hickory, hackberry, shortleaf pine, and longleaf pine.

The tillable sandy lands scattered over the county are largely in cultivation. Cotton is the principal crop, followed by corn. These lands are most commonly chosen for home gardens and home orchards, but there are some excellent gardens on the calcareous soils, and some pecan orchards are on well-drained Catalpa clay—a first-bottom soil in the prairie area. In certain localities especial use, such as truck farming near Cuba, is made of the sandy soils.

The soils of Sumter County may be classed in six main groups, based on their capability for use, which depends on their physical characteristics and chemical composition. These in turn determine responsiveness to management, crop adaptations, land use, tillage requirements, rapidity of warming in the spring, and, to a certain extent, drainage. These groups are as follows: (1) Soils suited to general farm crops; (2) soils suited to peanuts, fruits, cotton, oats, winter legumes, and corn; (3) calcareous soils suited to pasture, corn, oats, and hay; (4) acid soils suited to forest, pasture, and farm crops; (5) soils suited mainly to forest, kudzu, and cover crops; and (6) imperfectly and poorly drained soils suited mainly to forest and range-land pasture.

Even though each group includes soils that vary widely in regard to certain features, they have physical and chemical characteristics more or less in common. The physical characteristics have a very marked influence on the moisture supply that is available for the production of crops and consequently determines the crop adaptation of the soil, its response to fertilization, and susceptibility to erosion. The physical characteristics are very difficult to alter by farm practices. The unfavorable chemical characteristics may be overcome in a large measure for the production of most general farm crops by the addition of mineral fertilizers.

In the following pages the soil groups are discussed, the soils are described in detail, their agricultural relationship and adaptation and response to fertilizers are discussed, and their susceptibility to erosion is explained; their location and distribution are shown on the accompanying soil map; and their acreage and proportionate extent are given in table 4.

TABLE 4.—*Acreage and proportionate extent of the soils mapped in Sumter County, Ala.*

Soil type	Acres	Percent	Soil type	Acres	Percent
Red Bay fine sandy loam	3,584	0.6	Eutaw loam	3,456	0.6
Orangeburg fine sandy loam	1,536	.3	Wilcox clay	15,616	2.7
Ruston fine sandy loam	21,248	3.7	Lufkin clay	51,520	8.9
Vaiden fine sandy loam	23,296	4.0	Vaiden loam, terrace phase	832	.1
Cuthbert fine sandy loam	6,784	1.2	Eutaw clay, terrace phase	6,656	1.1
Norfolk fine sandy loam	2,880	.5	Eutaw loam, terrace phase	1,856	3
Pheba loam	7,936	1.4	Wilcox fine sandy loam	13,824	2.4
Amite fine sandy loam	576	1	Wilcox clay, rolling phase	11,008	1.9
Cahaba fine sandy loam	6,848	1.2	Ruston fine sandy loam, rolling phase	25,792	4.4
Wickham fine sandy loam	6,656	1.1	Ruston loamy fine sand, rolling phase	4,672	.8
Kalmia fine sandy loam	7,552	1.3	Cuthbert fine sandy loam, hilly phase	27,712	4.8
Vaiden fine sandy loam, terrace phase	768	1	Vaiden fine sandy loam, rolling phase	6,208	1.1
Altavista loam	5,952	1.0	Sumter clay, eroded phase	28,096	4.8
Leaf fine sandy loam	9,280	1.6	Sumter-Vaiden complex, hilly phase	11,520	2.0
Ochlockonee fine sandy loam	16,000	2.8	Guin soils, undifferentiated	13,760	2.4
Ruston loamy fine sand	6,144	1.1	Pheba fine sandy loam	512	.1
Cahaba loamy fine sand	6,848	1.2	Pheba loam, flat phase	8,704	1.5
Kalmia loamy fine sand	3,776	.6	Augusta silt loam	1,152	.2
Houston clay	5,888	1.0	Kalmia Myatt fine sandy loams	2,688	.5
Sumter clay	16,000	2.8	Leaf clay	9,728	1.7
Sumter-Oktibbeha clays	6,336	1.1	Leaf fine sandy loam, flat phase	7,808	1.3
Sumter-Oktibbeha clays, rolling phases	1,728	.3	Ochlockonee silt loam	50,560	8.7
Bell clay	14,528	2.5	Chastain very fine sandy loam	2,496	.4
Bell clay, flat phase	2,496	.4	Myatt fine sandy loam	7,552	1.3
Catalpa clay	24,512	4.2	Alluvial soils, undifferentiated	13,440	2.3
Catalpa clay, sanded phase	2,044	5	Swamp	1,984	.3
Catalpa clay, high-bottom phase	8,320	1.4			
Vaiden loam	3,904	.7			
Vaiden silty clay	19,392	3.3			
Eutaw clay	8,256	1.4	Total	581,120	-----

SOILS SUITED TO GENERAL FARM CROPS

The soils best suited to general farm crops constitute 20.9 percent of the county. They are the most friable, the most easily tilled, the most responsive to management, and the most suitable for diversified farming. Their color ranges from yellow to red.

The soils occupy smooth broad divides, flat hilltops, narrow winding ridges, and practically level benchlike positions on stream terraces, and they lie favorably for agricultural purposes. Erosion is not a serious problem. Most of the soils of the uplands, however, should be and are terraced. Winter cover crops aid in the control of erosion and improvement of the soil. Natural surface drainage and internal drainage are good. The soils warm early in the spring and are among the first on which agricultural operations are begun. The subsoils are sufficiently heavy textured to retain moisture and fertilizer; yet they are sufficiently pervious to allow free movement of moisture in the surface soil and subsoil and ample penetration of plant roots. They can be built to a high state of productivity, which, however, is not permanent, as fertilizers must be applied annually, either in mineral or organic form, for the economical production of crops.[5]

[5] The estimated productivity of the soils for certain crops is shown in the productivity-rating table (p. 63). More complete information regarding the use of fertilizers is brought forth in the section on land uses and agricultural methods.

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SOILS OF THE UPLANDS

Of the soils adapted to general farm crops, the following are developed on the uplands: Red Bay fine sandy loam, Orangeburg fine sandy loam, Ruston fine sandy loam, Vaiden fine sandy loam, Cuthbert fine sandy loam, Norfolk fine sandy loam, and Pheba loam.

Red Bay fine sandy loam.—Red Bay fine sandy loam is recognized as the reddest upland soil in the county and also as one of the best soils for the production of cotton, oats, and legumes. It was one of the first soils to be utilized for farming and has been in constant cultivation during the last 100 years. The ridges and plateaulike positions, on which it is developed, are surrounded by steep slopes, and in many places deep gullies are invading the fields. A profile of Red Bay fine sandy loam in this county shows the following characteristics:

0 to 8 inches, dark-brown or reddish-brown friable fine sandy loam containing enough organic matter to give it a darker appearance when wet.

8 to 12 inches, dark brownish-red fine sandy clay that is fairly friable but shows considerable stickiness when wet. This transitional zone is not everywhere present.

12 to 60 inches, brownish-red or red friable fine sandy clay, slightly sticky when wet.

Below this red layer both the color and texture become lighter, and at a depth ranging from 72 to 96 inches the material is reddish-yellow loamy sand containing streaks or pockets of yellowish-gray sand. Below a depth of 8 feet the texture in general is sand, but in places the open layer is gravel or gravel and sand. In many places this underlying material has been used for road building. Where Red Bay fine sandy loam is underlain with gravelly material, the open layer is reached at a depth ranging from 5 to 15 feet but in general is from 6 to 9 feet below the surface. In most places where this soil is underlain by a gravelly layer, both the texture and the color of the subsoil continue with little change down to the gravelly layer; whereas in the absence of a gravelly layer both color and texture gradually become lighter with depth.

Included in mapping are areas of Orangeburg fine sandy loam and Ruston fine sandy loam that are too small to separate. These inclusions have the same general land utilization as typical Red Bay fine sandy loam.

Red Bay fine sandy loam occupies nearly flat or gently undulating small well-drained plateaus and fairly broad divides. It is subject to considerable sheet erosion where not well terraced. The principal bodies are west of Memorial Bridge, northeast and northwest of Boyd, southeast of Whitfield, northeast of Derby, southeast and west of Panola, northeast of Epes, and north of Ward. The total area is not large.

Red Bay fine sandy loam is used almost entirely for the production of cotton, oats, and cowpeas. It is considered one of the best soils for the production of cotton, oats, corn, and winter cover crops and is satisfactory for the production of other crops. Practically all of the land is in cultivation. It is especially well adapted to the growth of legumes. Probably alfalfa would do well if a large quantity of basic slag or lime and phosphate were applied. Good yields of several crops have been obtained on Red Bay fine sandy loam at the Prattville experiment field of the Alabama Agricultural Experiment Station. In this field the 5-year average yield for cotton is 1,117 pounds of seed cotton per acre when fertilized with 600 pounds of a 6–8–4 fertilizer. Corn, when rotated with cotton, produced an average of 34 bushels an acre in a 6-year period when 225 pounds of nitrate of soda were applied as a side dressing. Other crops, including oats, soybeans, cowpeas, lespedeza, kudzu, and truck crops do proportionally well. The growth of winter cover crops or summer legumes is very beneficial to this soil, and the most economical yields generally are obtained by using either vetch, Austrian Winter peas, or crimson clover as a cover crop.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam has a brownish-gray surface soil, a yellowish-red upper subsoil layer, and a bright-red lower subsoil layer. This soil is developed on high well-drained plateaus or wide gently rounded ridge tops. It is associated with the Norfolk, Ruston, and Red Bay soils and is intermediate in soil characteristics between the latter two soils. It is an important agricultural soil even though of small extent.

In cultivated areas it has the following profile characteristics:

0 to 6 inches, brownish-gray loamy fine sand containing some organic matter.
6 to 15 inches, brownish-yellow or brown friable loamy fine sand or light fine sandy loam.
15 to 60 inches, bright-red or red firm but friable fine sandy clay that breaks into lumps of irregular size and is easily crushed to a friable mass.
60 inches +, yellow or brown loose loamy sand or moderately light sandy clay more or less mottled with red, yellow, and brown. The mottlings become more distinct with depth.

The reaction is medium to strongly acid throughout.

As mapped, Orangeburg fine sandy loam includes some small eroded areas in which the upper subsoil layer has become mixed with the surface soil, producing a brown or reddish-brown color, and the red subsoil lies only 5 or 6 inches below the surface. This included soil tends to be droughty and is not so responsive to good management as the typical soil. Small areas of Red Bay fine sandy loam, Ruston fine sandy loam, and Ruston loamy fine sand also are included.

This soil is developed in small disconnected areas, which are remnants of the higher plain, and in a few scattered well-drained sandy clay areas in association with the heavier soils. Small bodies are north and northwest of Woodford, south and west of Derby, 5 miles northwest of Gainesville, and northwest of York near Oxford Church and northward. The total area is small.

Practically all of this soil is devoted to general farm crops. Owing to the sandy surface soil and a friable upper subsoil layer, the land is easy to till, warms early in the spring, gives up moisture readily to growing plants, and is very responsive to the use of commercial fertilizers, barnyard manure, and green-manure crops. Probably 75 percent of it is used for the production of cotton, and the rest for the production of oats, corn, and hay. Cotton yields from ½ to 1 bale per acre when liberally fertilized, and corn yields from 25 to 35 bushels under good management. In an experimental field on Orangeburg fine sandy loam at Monroeville, the cotton yield over a 4-year period averaged 1,060 pounds of seed cotton per acre when fertilized with 600 pounds of a 6-8-4 fertilizer. The average yield of corn, when grown in rotation with cotton that received a large application of mixed fertilizer the preceding year and when fertilized with 225 pounds of nitrate of soda an acre as a side dressing, was 31 bushels an acre. When corn follows a green-manure crop no additional fertilizer is needed. Other of the commonly grown crops are well suited to this soil.

Ruston fine sandy loam.—Ruston fine sandy loam is an excellent agricultural soil and is very closely associated with the Norfolk, Orangeburg, and Red Bay soils. It is intermediate between the Norfolk and Orangeburg soils and has a darker colored subsoil than the former and a lighter colored subsoil than the latter.

The following profile characteristics are observed in cultivated areas:

0 to 6 inches, brownish-gray or yellowish-gray loose loamy fine sand.
6 to 10 inches, grayish-yellow or brownish-yellow loamy fine sand.
10 to 15 inches, yellowish-brown or brownish-yellow friable fine sandy loam.
15 to 30 inches, yellowish-red or rusty-brown friable fine sandy clay
30 inches +, compact fine sandy clay material streaked and mottled with light red and yellow. It is brittle and compact but breaks down readily to a friable mass.

The reaction is medium to strongly acid throughout.

Included with areas of Ruston fine sandy loam are areas of Pheba loam, Orangeburg fine sandy loam, Ruston loamy fine sand, Vaiden fine sandy loam, and Cuthbert fine sandy loam, which are too small to separate on a small-scale map. In the sand hills and on some of the redeposited sandy areas in the northern part of the county, the surface soil is deeper and more sandy than elsewhere. In the areas bordering Vaiden fine sandy loam, the subsoil is stiffer and shallower than the typical subsoil. In most of the places where the soil is formed on the sandy redeposits over the Sucarnoochee clay formation, the surface soil and subsoil are shallower and the subsoil more definitely mottled. The surface soil and subsoil contain a larger proportion of very fine sand and silt in the southwestern part. The lower part of the subsoil generally is very much heavier in the areas on the slopes west, north, and northeast of Cuba.

This is a fairly extensive soil. The principal areas are in the central and eastern parts known as the sand hill area, and near Cuba.

Ruston fine sandy loam is one of the principal agricultural soils. This is due to its favorable physical characteristics, excellent moisture conditions, and level to gently sloping surface. It is subject to some erosion, but this can be controlled by terraces in most places.

Practically all of this soil is cleared and most of it is tilled. It is well suited to a diversified system of farming and produces large yields of crops under good management. Any cropping system suited to the locality may be used on this soil with excellent results. It is well adapted to all the crops commonly grown, with the exception of the lime-loving crops. Winter legumes have proved very beneficial in building and mantaining the fertility of this soil. Its responsiveness to good management, its productivity, its crop adaptations, its land use, and its fertilizer requirements are about the same as for Orangeburg fine sandy loam.

Probably 80 percent of the tilled area of this soil is in cotton, which yields from 1/3 to 1 bale per acre, depending on the season and on the quantity of fertilizer used. The average production is more than one-half bale on the better operated farms. Corn, next in importance, yields from 10 to 35 bushels, with an average of about 26 bushels. If winter legumes are plowed under and followed by corn, the yield is considerably increased. Other crops grown principally for home use are peanuts, sweetpotatoes, potatoes, cowpeas, beans, soybeans, pecans, and peaches. Bright-leaf tobacco may also be grown on this soil. A large proportion of the acreage near Cuba is used for production of commercial truck crops. In this area the soil is fertilized with from 1,000 to 2,000 pounds of 4-8-4 fertilizer, or a home mixture of 800 pounds of cottonseed meal, 400 pounds of superphosphate, and 100 pounds of potash for the truck crops. The truck crop is followed by corn or cotton. No additional fertilizer is used for corn, but some farmers side dress the cotton with 100 pounds of nitrate of soda. In this particular area the average yields for both cotton and corn are higher than on the soil as a whole.

Vaiden fine sandy loam.—Vaiden fine sandy loam is one of the most important agricultural soils in this county. Fairly large areas and numerous small ones are scattered over the northeastern half. It is a yellow prairie soil having a sandy surface soil.

It has the following profile characteristics in cultivated areas:

0 to 5 inches, gray or brownish-gray fine sandy loam or loamy fine sand.
5 to 10 inches, brownish-yellow friable fine sandy loam.
10 to 20 inches, dark-yellow or brownish-yellow heavy fine sandy clay that is sticky when wet.
20 inches +, yellow stiff sticky clay mottled with pale yellow, gray, rust brown, and red. The mottlings increase with depth, until the Selma chalk formation is approached, which generally lies at a depth ranging from 4 to 6 feet. The color becomes more uniformly yellow immediately above the chalk.

The reaction is very strongly acid down to the Selma chalk formation.

The most typical areas of Vaiden fine sandy loam occur northeast and southeast of Emelle, in the vicinity of Belmont, and north of Brewersville. Several areas are included with this soil, in which the surface soil is deep loamy fine sand and the subsoil is light loose fine sandy loam to a depth ranging from 20 to 24 inches, where the heavy subsoil layer is reached. Some of these areas are near Geiger, ½ to 3 miles southeast of Livingston, 3 miles northeast of Livingston, and in the vicinity of Nelson School southwest of Geiger. The areas with the deep loose surface covering compare very favorably with the typical soil, because the stiff heavy subsoil retains moisture well and retards leaching. Some shallow-rooted crops, such as grasses and oats, will not do so well on these deep soil areas as on the typical soil in hot dry weather, but the deeper feeding crops suffer less. Also included in mapping are small areas of Vaiden clay, Vaiden loam, Ruston fine sandy loam, and Oktibbeha fine sandy loam, which are too small to be shown on a map of the scale used. Small bodies of chalk are exposed in many places.

A large area of Vaiden fine sandy loam southwest of Geiger contains many small depressions or shallow flat swales, which would have been separated as Eutaw loam, had their size warranted such separation.

Vaiden fine sandy loam occurs on broad undulating ridges and has a slope ranging from 1 to 5 percent and averaging about 3 percent.

Surface drainage ranges from good to excessive, whereas internal drainage at a depth ranging from 20 to 30 inches is slow, owing to the heavy texture of the subsoil.

About 85 percent of this land is in cultivation. It originally produced excellent timber, such as shortleaf pine and oaks and other hardwoods. It is a productive soil and responds readily to the use of fertilizers or green-manure crops in the form of leguminous winter cover crops. It is fairly easy to maintain in a productive condition.

Most of this soil is used for the production of cotton and corn. The yields of cotton range from ⅓ to 1 bale per acre, depending on weather conditions, management, and quantity of fertilizers used, and yields of corn range from 15 to 30 bushels. Hay crops, peanuts, sweetpotatoes, home gardens, and other crops occupy smaller acreages. On farms containing both Vaiden fine sandy loam and calcareous prairie soils or bottom lands influenced by the lime formation occurring under the Vaiden soils, livestock raising or dairying generally is one of the important enterprises. Some small areas of Vaiden fine sandy loam are pastured, but most of the uncultivated land is in forest, principally shortleaf pine. This soil and Norfolk fine sandy loam have essentially the same crop adaptations and fertilizer requirements. They also produce comparable yields under similar management.

Cuthbert fine sandy loam.—Cuthbert fine sandy loam occurs in close association with the Ruston soils on small flat plateaus, on broad ridge tops, and on some gentle slopes, principally in the southwestern part of the county. The subsoil, in contrast to the friable subsoil of the Ruston soils, is compact. In this county, this soil is deeper and much better for agriculture than it is in other parts of the State.

In cultivated areas it has the following profile characteristics:

0 to 7 inches, brownish-gray loamy fine sand.
7 to 10 inches, yellowish-brown friable fine sandy loam.
10 to 20 inches, reddish-brown or brownish-red compact tough heavy clay containing some very fine sand and a small amount of finely divided mica.
20 to 50 inches, reddish-brown compact tough clay intensely mottled with yellow, brown, and gray.
50 inches +, laminated gray clay and red and yellow fine sand.

The reaction is strongly acid to very strongly acid throughout.

This soil includes small areas that would be mapped as Ruston fine sandy loam, Wilcox fine sandy loam, and Luverne fine sandy loam, if they were larger. The last-mentioned soil is similar to Cuthbert fine sandy loam, except that the subsoil has a more intense and uniform red color.

About 90 percent of the land has been cleared for cultivation, but probably one-fifth has reverted to forest and range land. The forest growth is principally old-field pine, post oak, and blackjack oak. Lespedeza and carpet grass supply most of the grazing, and their period of growth is limited largely to spring and early summer. Cotton is the principal crop. Some oats, corn, and hay are also grown. Yields of one-half to four-fifths of a bale of cotton per acre and from 10 to 25 bushels of corn are normally obtained. Oats and winter cover crops return fairly good yields under good management. The primary essentials for the improvement of this soil are well-constructed terraces, deep plowing, and heavy phosphate fertilization, followed by a legume crop to be turned under. This will not only supply plant nutrients but also will help conserve moisture which is very necessary for the production of crops. Cotton should be fertilized with from 300 to 600 pounds per acre of a 6–8–4 mixture. Corn should be rotated with cotton and fertilized with from 150 to 225 pounds of nitrate of soda or its equivalent. Oats should follow cotton and should receive from 150 to 200 pounds of nitrate of soda or its equivalent.

Norfolk fine sandy loam.—Norfolk fine sandy loam is an upland sandy soil with a yellow loose and friable fine sandy clay subsoil. It is closely associated with Vaiden fine sandy loam, Pheba loam, and Ruston fine sandy loam. It differs from Pheba loam in having more uniformly colored and somewhat more friable surface and upper subsoil layers. The Ruston soils are brown, whereas the Norfolk soils are yellow.

Where cultivated it shows the following profile characteristics:

0 to 7 inches, gray fine sandy loam or loamy fine sand.
7 to 14 inches, yellow or grayish-yellow fine sandy loam.
14 to 32 inches, yellow friable fine sandy clay that is very uniform in color.
32 inches +, yellow fine sandy clay containing some mottlings of yellow, gray, and rust brown. The texture becomes lighter and the yellow color becomes less pronounced with depth.

The soil is medium acid to strongly acid throughout.

Norfolk fine sandy loam as mapped includes some small areas of Ruston fine sandy loam, Vaiden fine sandy loam, and Pheba loam that are too small to separate on a small-scale map.

The total area of this soil is small. The principal bodies are north of Factory Creek, near Nelson School, in the vicinity of Panola, south of Geiger, east of Brewersville, and southeast of Coatopa. The relief is very favorable for agriculture as the slope in most places does not exceed 3 percent. A few areas occur on slopes with a 5- or 6-percent gradient. Because of the favorable relief and porosity of the soil, water is absorbed readily and erosion is not serious. Most of the land, however, should be and is terraced.

Practically all of this soil is in cultivation year after year. This is due to its excellent physical characteristics and its relief. All locally grown crops, including tobacco, are well adapted to this soil. About 60 percent of the land is used for the production of cotton, and the rest is devoted to corn, oats, and hay. Yields of cotton normally range from one-third to two-thirds of a bale per acre, and yields of corn range from 8 to 30 bushels, depending on fertilization and management. Other crops make proportionally good yields. Some farmers use cover crops preceded by liberal application of phosphate or basic slag, or they use a liberal application of complete fertilizer in order to obtain larger yields.

Pheba loam.—Pheba loam is closely associated with the Norfolk and Ruston soils. It resembles the Norfolk more closely, except that it is not so well drained in the lower part of the subsoil, is more mottled, and has a compact lower layer.

In cultivated areas it has the following profile characteristics:

0 to 5 inches, gray loam that contains a large quantity of fine sand and is darkened in many places by the presence of organic matter.
5 to 18 inches, pale grayish-yellow loose friable loam or heavy fine sandy loam, containing a few faint mottlings of gray and yellow.

18 to 30 inches, yellow or brownish-yellow friable very fine sandy clay faintly mottled with shades of gray, yellow, and brown. This material is somewhat compact in place, but when removed it crushes easily to a friable mass.

30 to 40 inches, mottled yellow, yellowish-gray, and reddish-brown light very fine sandy clay, which is hard and compact when dry but somewhat sticky when wet.

In most places, at a depth ranging from 40 to 84 or more inches, is a zone composed of rather impervious layers of mottled yellow, brown, and pale-gray fine sandy loam, very fine sandy loam, or sandy loam, alternating more or less with bluish-gray tough and slightly plastic clay.

The reaction is strongly acid or very strongly acid throughout.

Small areas, which would be mapped as Ruston fine sandy loam, Norfolk fine sandy loam, and Pheba loam, flat phase, had they been larger, are included with Pheba loam.

The principal areas are in the south-central and southern parts of the county, and smaller areas are near Geiger and Panola in the northern part.

The land is nearly flat, gently sloping, or gently undulating, except adjacent to some of the drainageways where the relief is more pronounced. Surface drainage ranges from fair to good but internal drainage from fair to slow. In general, erosion is not a serious problem, but in places terracing should be used to prevent erosion of both the sheet and gully types.

Probably 65 percent of this soil is in cultivation. Cotton is the main crop, and corn ranks second in importance. Small acreages of the common food and feed crops are grown for consumption in the home. Crop yields are normally slightly less on this soil than on Ruston fine sandy loam or Norfolk fine sandy loam, but, under similar management, it is comparable to these soils for the production of sorghum and soybeans. Normally, yields ranging from one-third to two-thirds of a bale of cotton per acre and 8 to 30 bushels of corn are obtained. Sugarcane does well, and the sirup is of excellent quality. Cotton should be fertilized with from 300 to 600 pounds per acre of a 6–8–4 mixture, or its equivalent. Corn should follow a winter legume that has been fertilized with from 200 to 400 pounds of superphosphate, or its equivalent of basic slag; or it should follow a cotton crop and receive from 150 to 225 pounds of nitrate of soda, or its equivalent. Bright-leaf tobacco may also be grown on this soil.

The water supply in this soil for home use generally can be obtained from shallow open wells dug through the sandy layer into the heavy clay. Where the water table is high, it is not necessary to reach the clay, but ordinarily the clay catches and holds the water, which seeps into the well at the junction of the sandy covering and the impervious clay.

SOILS OF THE TERRACES AND OVERFLOW BOTTOMS

Of the soils suited to general farm crops, the following occur in terrace positions: Amite fine sandy loam, Cahaba fine sandy loam, Wickham fine sandy loam, Kalmia fine sandy loam, Vaiden fine sandy loam, terrace phase, Altavista loam, and Leaf fine sandy loam. Ochlockonee fine sandy loam occurs in overflow bottoms.

Amite fine sandy loam.—Amite fine sandy loam is similar to Red Bay fine sandy loam except that it occurs in terrace or second-bottom positions rather than in upland positions. This is possibly the best soil in the county for general farm crops.

Amite fine sandy loam has the following profile characteristics in cultivated areas:

0 to 7 inches, brown or reddish-brown friable fine sandy loam.
7 to 12 inches, reddish-brown friable heavy fine sandy loam.
12 to 40 inches, brownish-red or dark-red firm but friable fine sandy clay, which is readily crushed to a mealy mass, is uniform in color, and is somewhat sticky when wet.
40 inches +, light-red or reddish-yellow fine sandy clay mixed with coarse gravel, sand, and gray and yellow clay.

As most areas of this soil are associated with Wickham fine sandy loam in this county, small bodies of the latter soil are included in mapping. The soil on the outer edges of the areas is heavier textured than is typical, as it is influenced by the associated heavy-textured Wickham soils.

This soil is inextensive. The land is practically level or gently undulating. The principal areas are near McDowell and northwest of Gainesville.

Practically all of this soil is in cultivation. It is one of the most highly prized soils in the county and is used largely for the production of cotton, oats, cowpeas, and, to less extent, corn. Cotton yields normally range from ½ to 1 bale or more per acre when liberally fertilized. Yields of other crops are proportionally good.

Recommendations relative to crops, fertilization, and management of Red Bay fine sandy loam are applicable to this soil. Amite fine sandy loam is possibly slightly better suited to the production of corn than Red Bay fine sandy loam, as it absorbs and gives up moisture a little better than that soil. The Red Bay and Amite soils possibly are better suited to the production of legumes than most of the sandy upland soils, as they contain some lime and magnesium, which are very beneficial for the production of legumes. Alfalfa has been grown successfully on a similar soil in Hale County where an application of 1 to 2 tons per acre of basic slag, or an equivalent amount of lime and phosphate, has been used.

Cahaba fine sandy loam.—Cahaba fine sandy loam is an excellent agricultural soil. It is similar to Ruston fine sandy loam of the up lands, but it is associated with the Kalmia, Amite, and Wickham soils of the terraces. It is intermediate in color and development between the Kalmia and Amite soils. It is very similar in color to the Wickham soils but has a much looser and more friable subsoil.

The cultivated areas of Cahaba fine sandy loam show the following profile characteristics:

0 to 6 inches, brownish-gray loamy fine sand.
6 to 14 inches, brownish-yellow friable fine sandy loam or loamy fine sand.
14 to 30 inches, reddish-brown or rusty-brown friable fine sandy clay.
30 inches +, yellowish-brown fine sandy clay, which grades, in many places, into loose fine sand at a depth ranging from 40 to 50 inches.

The soil is strongly acid throughout.

The soil in areas near Cuba differs from typical Cahaba fine sandy loam in that the subsoil, at a depth ranging from 20 to 40 inches, is brownish-red moderately stiff and somewhat compact very fine sandy clay mottled with some yellow and brown, grading at greater depth into mottled gray and bluish-gray clay. This subsoil layer breaks into irregular blocky lumps along well-defined planes, which are coated with brown colloidal material. The included soil is developed from material washed from the surrounding Cuthbert soils, causing it to be more compact than typical Cahaba fine sandy loam. This variation is included with the Cahaba soil as it has the same kind of surface soil and upper subsoil layer and for this reason is suited to the same agricultural uses.

Practically all of Cahaba fine sandy loam is under cultivation. Areas are on the terraces here and there along the Tombigbee River; along the Sucarnoochee River, especially near Bellamy, Livingston, and Boyd; along Alamuchee Creek, especially near Cuba; and along Kinterbish Creek and its tributaries, especially near Ward.

In general, this soil is not very susceptible to erosion. The use of green-manure crops, especially winter legumes, is recommended for the improvement of both the fertility and the physical condition, which enable the soil to resist erosion.

This is one of the most productive soils in the county and is very responsive to fertilization. It is well suited to general farm crops, but the greater part is used for the production of cotton. Corn and hay crops generally are grown on the associated soils. Under good management cotton yields from one-half to more than 1 bale per acre and corn, 20 to 35 bushels.

Wickham fine sandy loam.—Wickham fine sandy loam is similar to Cahaba fine sandy loam, except for its tighter stiffer subsoil. It occupies the low rounded or slightly elevated situations or terrace positions along the principal streams.

The cultivated areas show the following profile characteristics:

0 to 5 inches, brownish-gray friable loamy fine sand.
5 to 10 inches, yellowish-brown fine sandy loam.
10 to 24 inches, reddish-brown smooth firm brittle compact fine sandy clay.
24 to 40 inches, yellowish-brown heavy fine sandy clay mottled with some red, yellow, and gray.
40 inches +, yellow and brown friable fine sandy loam or loamy fine sand, containing a large amount of mica.

The reaction is strongly acid throughout.

Included with this soil are several small areas of Altavista fine sandy loam, Augusta silt loam, and Cahaba fine sandy loam, which are too small to map separately.

The largest areas occur along the Tombigbee River southwest and northeast of McDowell, near Gainesville, and near Lake Hollolla. Smaller areas are along the Sucarnoochee River near Bellamy and Boyd.

The land is practically level, but in a few places, where the slope is as much as 2 or 3 percent, some sheet erosion has taken place. The surface soil has also been removed in a few places by the river, during periods of extremely high water. Since this soil occurs in comparatively large and level areas, it is well adapted to the use of power machinery. Cotton, oats, and corn are the principal crops, of which the yields are from one-third to two-thirds of a bale per acre, 16 to 30 bushels, and 8 to 25 bushels, respectively. An application ranging from 300 to 600 pounds per acre of a 6–8–4 fertilizer probably is best for the production of cotton, whereas an application ranging from 150 to 225 pounds of nitrate of soda is sufficient for the production of corn or oats following a cotton crop that has been fertilized heavily.

Kalmia fine sandy loam.—Kalmia fine sandy loam is closely associated with Cahaba fine sandy loam, from which it differs mainly in the color of the subsoil and in occupying slightly lower positions farther back on the flat terraces. Although drainage is slower than in the Cahaba soil, this is a well-drained soil. The profile of Kalmia fine sandy loam is very similar to that of Norfolk fine sandy loam of the uplands.

In cultivated areas it has the following profile characteristics:

0 to 6 inches, gray loamy fine sand or loamy very fine sand, darkened by organic matter in places.
6 to 12 inches, grayish-yellow or brownish-gray fine sandy loam.
12 to 24 inches, yellow or brownish-yellow friable fine sandy clay.
24 inches +, firm friable yellow fine sandy clay, dominantly gray and somewhat plastic below a depth of 32 inches.

The soil is strongly acid to medium acid throughout.

Most of Kalmia fine sandy loam in Sumter County contains a high proportion of fine sand and silt in both the surface soil and subsoil. In the areas near Cuba and those along Kinterbish Creek the subsoil, below a depth of 24 inches, is a pale yellowish-gray very fine sandy clay mottled with reddish brown, brownish yellow, and gray. It is somewhat compact in place. At a depth ranging from 30 to 40 inches this material gives way to a splotched grayish-yellow and red stiff plastitc clay mottled with some gray and rusty brown.

Areas of Kalmia fine sandy loam are scattered over the terraces along the Tombigbee, Sucarnoochee, and Noxubee Rivers and Alamuchee and Kinterbish Creeks.

The level to slightly undulating surface of the land is very favorable for cultivation. Terraces are helpful in many places for the prevention of erosion, but they are seldom needed. Practically all of the land is farmed. It is well suited to all the crops commonly grown and responds well to good farm practices. Although the greater part is used for cotton, other crops may be produced satisfactorily if the soil is well managed. The natural deficiency in mineral plant nutrients must be supplied either in the form of commercial fertilizers or by turning under cover crops that have been fertilized with phosphate or basic slag. Under good management cotton normally yields from ½ to 1 bale per acre and corn, 20 to 30 bushels. On the experiment field at Aliceville, in Pickens County, the 5-year average yield of cotton, when the land was fertilized with 600 pounds of a 6–10–4 fertilizer, was 990 pounds of seed cotton per acre. When corn was fertilized with 225 pounds of nitrate of soda in rotation with cotton, 30.5 bushels per acre were produced. Other crops, including oats, hay crops, bright-leaf tobacco, winter cover crops, and truck crops should make corresponding yields. Sugarcane and sorghum are especially suited to this soil.

Vaiden fine sandy loam, terrace phase.—Vaiden fine sandy loam, terrace phase, is very similar to Vaiden fine sandy loam on the uplands, except that it has developed from material brought down by the streams. This soil is essentially the same agriculturally, economically, and agronomically as Vaiden fine sandy loam.

The profile characteristics are as follows in cultivated areas:

0 to 5 inches, gray or brownish-gray fine sandy loam.
5 to 10 inches, grayish-yellow or dark grayish-yellow fine sandy loam or light fine sandy clay.
10 to 20 inches, yellow or brownish-yellow heavy fine sandy clay or clay, which is sticky when wet. Some gray and brown mottlings are present in the lower parts.
20 inches +, yellow sticky stiff clay mottled with pale yellow, gray, rusty brown, and red.

Chalk is present at a depth ranging from 3 to 6 feet.

This soil includes small areas of Eutaw loam, terrace phase; Vaiden loam, terrace phase; Bell clay; Leaf fine sandy loam; and Kalmia fine sandy loam, which are too small to map separately.

This soil occupies a small total acreage, most of which borders Bodka Creek west of Bodka.

The land ranges from level to gently sloping and, in general, is not subject to severe erosion. Terracing, however, is beneficial in most places. Practically all of it has been cleared, and most of it is now being used for the production of farm crops, especially cotton, oats, corn, and sugarcane. Some of the areas are being used for pasture, as it also is fairly well suited to the production of pasture grasses, principally carpet grass, lespedeza, and Dallis grass. Yields of cotton normally range from one-third to two-thirds of a bale per acre, and yields of corn from 8 to 25 bushels. Under good management, hay crops, peanuts, oats, sweetpotatoes, okra, and most of the other crops ordinarily grown produce satisfactory yields on this soil.

Altavista loam.—Altavista loam occurs in terrace positions, closely associated with Wickham fine sandy loam. It differs from the Wickham soil in having a yellow rather than a reddish-brown subsoil.

In cultivated areas it has the following profile characteristics:

0 to 5 inches, gray or dark grayish-brown fine or very fine sandy loam.
5 to 7 inches, pale-yellow friable fine sandy loam.
7 to 24 inches, yellow or light brownish-yellow heavy stiff firm smooth fine sandy clay.
24 inches +, mottled yellow, gray, and brown fine sandy clay containing some finely divided mica. Below a depth of 30 inches the material generally becomes more friable, and in places the underlying material changes to friable loamy fine sand.

The reaction is strongly acid throughout.

As this soil is associated with Wickham fine sandy loam and Augusta silt loam, a few small areas of each are included in mapping. A few small bodies of Altavista silt loam also are included. Some areas north of Bellamy have a surface soil, from 8 to 14 inches thick, of pale brownish-gray or gray loamy fine sand over brownish-yellow slightly plastic smooth clay.

Small scattered bodies of this soil occupy the terraces of the larger streams, principally the Tombigbee, Sucarnoochee, and Noxubee Rivers.

About 65 percent of this soil is in cultivation, and most of the rest is used for pasture. Cotton and oats are the chief crops, but sugarcane, sorghum, corn, and hay are grown also. Cotton yields from one-fourth to one-half of a bale per acre; corn, 7 to 20 bushels; and oats, 12 to 30 bushels under common farm practices, but these yields can be increased under improved agricultural methods. An application ranging from 300 to 500 pounds per acre of 6–8–4 fertilizer is most satisfactory for cotton, and oats or corn should be grown in rotation with cotton and receive an application ranging from 150 to 225 pounds of nitrate of soda, or its nitrogen equivalent.

Leaf fine sandy loam.—Leaf fine sandy loam occupies low terrace positions along the streams flowing from areas of Wilcox fine sandy loam, Cuthbert fine sandy loam, Vaiden fine sandy loam, and Oktibbeha fine sandy loam, and it is composed of heavy materials washed from these soils.

The cultivated areas show the following profile characteristics:

0 to 5 inches, gray or pale-gray fine sandy loam.
5 to 10 inches, grayish-yellow or pale-yellow friable fine sandy loam.
10 to 20 inches, mottled gray, yellow, and rusty-brown sticky fine sandy clay.
20 inches +, mottled gray, yellow, and red plastic or sticky fine sandy clay.

This soil is strongly acid to very strongly acid throughout.

Included with mapped areas of this soil are several small strips or depressions that would be separated as Leaf fine sandy loam, poorly drained phase, if they were large enough. The soil in these strips is inferior to the typical soil. Along Kinterbish Creek there are included a few areas of a soil intermediate in development between Leaf fine sandy loam and Kalmia fine sandy loam. This inclusion is far superior to the typical soil.

Fairly large areas are developed along Kinterbish Creek south and west of Ward and along the Tombigbee River northwest of McDowell and northwest of Belmont. Smaller areas occur along some of the larger creeks.

Drainage is poor, owing to the nearly level surface and heavy subsoil that checks the downward movement of water. The soil is therefore best suited to crops that grow during the drier season and to those crops that withstand a high degree of acidity. This soil is very acid in reaction.

Less than 50 percent of the land is in cultivation, and the rest is mostly in pasture or range land. The principal crops are sugarcane, soybeans, corn, and cotton. Cotton yields from one-fifth to one-half of a bale per acre. The best utilization of the land is for the production of soybeans and sugarcane, although the other crops mentioned may be grown on areas where drainage has been provided. Areas in pasture and range land produce largely carpet grass, Dallis grass, and lespedeza. The quality of the pasture grasses may be improved by a liberal application of superphosphate and lime, or basic slag. Dallis grass, hop clover, and other legumes may be grown satisfactorily when thus fertilized. In many fields it is necessary to remove sweetgum sprouts, blackberry vines, and sedge grass from the pastures, as they tend to crowd out the pasture grasses.

Soybeans should be fertilized with from 200 to 400 pounds of superphosphate or an equivalent amount of basic slag. For the production of corn, from 100 to 200 pounds of nitrate of soda, or its equivalent, is generally considered sufficient, although a small amount of superphosphate and muriate of potash would no doubt be profitable unless the crop is grown in rotation with cotton. Except in a few well-drained areas, winter legumes are not very satisfactorily grown on this soil, owing to excessive moisture in the spring. The principal trees growing on this soil are sweetgum, black gum, and post oak.

Ochlockonee fine sandy loam.—Ochlockonee fine sandy loam is a brown sandy soil occupying the first bottoms along the major streams, and it is subject to overflow during periods of high water. It is an alluvial soil composed of outwash from the Red Bay, Orangeburg, Ruston, and other soils and is variable, depending on the amount of deposition that has taken place from the overflows.

The cultivated areas show the following profile characteristics:

0 to 8 inches, brown friable mellow fine sandy loam
8 to 30 inches, brown friable fine sandy clay containing a few yellow and gray mottlings in the lower part of the layer.
30 inches +, gray and brown mottled fairly friable fine sandy clay.

This soil is strongly acid in reaction throughout.

Along the Tombigbee River the surface soil is brown very fine sand that passes at a depth ranging from 12 to 24 inches into brown friable silty clay mottled with some gray and rusty brown. Very little of this included soil is cultivated.

An almost continuous area borders Alamuchee Creek, and fairly large bodies occur along the Sucarnoochee River, the Tombigbee River, Kinterbish Creek, and Cotohaga Creek. The main areas along the Tombigbee River are near Pace Landing, northwest and south of lock No. 3, and west of Merryweathers Ferry.

Ochlockonee fine sandy loam is a productive soil but in some locations is subject to hazardous overflows. It is used largely for the production of corn, ribbon cane, sorghum, peanuts, field peas, and some cotton. Corn and hay crops do especially well. Yields of all these crops are usually very good. Fertilizers are seldom used. About 50 percent of the land is in cultivation, and most of the rest is used for open pasture and range-land pasture. It is well suited to carpet grass, Dallis grass, lespedeza, Bermuda grass, and hop clover.

Very little is known about the fertilizer requirements for the crops grown on this soil, but an application ranging from 100 to 150 pounds of nitrate of soda no doubt would be profitable for the production of corn, and a 3-8-5 mixture probably would be profitable for the production of cotton. The nitrogen supply in this soil is comparatively high.

SOILS SUITED TO PEANUTS, FRUITS, COTTON, OATS, WINTER LEGUMES, AND CORN

Ruston loamy fine sand, Cahaba loamy fine sand, and Kalmia loamy fine sand comprise the group of soils suited to peanuts, fruits, cotton, oats, winter legumes, and corn and represent 2.9 percent of the area of the county. The soils are extremely sandy, can be tilled with light equipment, are level to gently sloping, and are the earliest soils on which farm operations can be started. On the other hand, the plant nutrients are readily leached and an insufficient supply of moisture is retained for maximum yields of summer-growing crops. They are best suited to the production of peanuts, peaches, velvetbeans, oats, cotton, winter legumes, and corn.

Ruston loamy fine sand.—Ruston loamy fine sand differs from Ruston fine sandy loam in that the subsoil is lighter in texture and more subject to leaching. This soil occurs in close association with the fine sandy loams of the Red Bay, Orangeburg, Ruston, and Norfolk series.

It has the following profile characteristics:

0 to 6 inches, grayish-brown or dark grayish-brown loamy fine sand, in many places containing a dark coloration imparted by organic matter.
6 to 24 inches, brownish-yellow loose friable loamy fine sand.
24 to 32 inches, rusty-brown loose loamy fine sand.
32 inches +, yellow or light brownish-yellow fine sand. In some locations the material in this layer is brown fine sandy loam. Loamy sand probably extends to a depth of 8 or more feet before the underlying sand, or, in some places, sandy clay is reached.

The reaction is medium acid to strongly acid.

This soil includes small areas of Ruston fine sandy loam and a number of areas of Norfolk loamy fine sand too small to show separately on the map. The latter inclusions are chiefly within the areas southeast of Chestnut Grove Church. In this county the Norfolk and Ruston loamy fine sands are too intricately associated to justify their separation, and there is very little economic or agronomic difference between them. Some small depressions, few of which exceed one-half acre in size, are within the area 7½ miles southeast of York. These depressions receive wash from the surrounding soils, and the soil contains a large quantity of organic matter. They are, therefore, productive and are used mainly for the production of corn, sugarcane, hay crops, and sorghum.

The principal areas of this soil are southwest, south, and southeast of York, northeast of Brewersville, and in the vicinity of Coatopa.

Since the slope of the land in few places exceeds 3 percent and rainfall is absorbed very rapidly, erosion is a minor problem, but terraces are helpful in some places. The greatest drawback to the soil is its sandy and porous character that allows rain water to percolate through it rather rapidly, removing part of the soluble plant nutrients before the plants can utilize them. The supply of moisture is not sufficient for maximum yields of crops, although fair to good yields are obtained under good management.

Probably 75 percent of Ruston loamy fine sand has been brought into cultivation. Many areas are fallowed every 3 to 5 years to allow weeds and lespedeza to grow, which are turned under. Cotton, corn, peanuts, oats, and hay are the chief crops. Cotton yields from one-fourth to five-eighths of a bale per acre, corn 6 to 20 bushels, and hay one-half to 1 ton. Peanuts, early vegetables, melons, potatoes, peaches, berries, velvetbeans, grapes, and oats also do well.

Large quantities of organic matter should be turned under each year, or at least in alternate years, in order to maintain the productivity of this soil. The organic matter aids in the retention of moisture as well as supplies plant nutrients. Liberal applications of fertilizer are needed when cover crops are not grown.

An application of 300 to 600 pounds of a 6–8–4 or 6–8–6 fertilizer should be used for cotton, and an application of 150 to 225 pounds of nitrate of soda, or its equivalent, should be used for corn or oats when used in rotation with cotton. Peanuts possibly need no fertilization following cotton that has been heavily fertilized.

Cahaba loamy fine sand.—Cahaba loamy fine sand differs from Cahaba fine sandy loam principally in texture and to a certain extent in color. The loamy fine sand is slightly lighter colored and contains much less clay than the fine sandy loam.

In cultivated areas Cahaba loamy fine sand has the following profile characteristics:

0 to 6 inches, brown loamy fine sand containing enough organic matter in places to impart a dark coloration.
6 to 32 inches, light yellowish-brown loose friable loamy fine sand.
32 inches +, dark grayish-yellow or brown fine sandy clay in some places, and in other places yellowish-gray loamy fine sand that continues to a depth of several feet.

The soil is medium acid to strongly acid throughout.

Some areas of Kalmia loamy fine sand and some spots of Cahaba and Kalmia fine sand are included in mapping. The soil in areas along the Tombigbee River is lighter textured than typical, as it has a loamy very fine sand or very fine sand surface soil over a loose very fine sand subsoil.

From 50 to 60 percent of the land is cultivated annually. The larger areas are along the Tombigbee and Sucarnoochee Rivers, and smaller scattered areas are along the smaller streams.

Cahaba loamy fine sand, occurring as it does in level positions, is not subject to erosion. Its loose sandy character allows the rapid percolation of water and ready leaching of soluble plant nutrients.

Cahaba loamy fine sand is closely associated with the fine sandy loams of the Wickham, Cahaba, and Amite series, and in general it occupies slightly higher positions than those soils. It is, therefore, used for building sites, truck gardens, and some general farm crops. This soil is best suited to the early spring crops, peanuts, small fruits, watermelons, peaches, cotton, oats, and velvetbeans. Fairly good yields of corn, cotton, and other farm crops may be obtained following winter cover crops or when the land has been liberally fertilized. Cotton yields from one-fourth to five-eighths of a bale per acre, and corn, from 8 to 20 bushels under good management. This soil responds readily to fertilization, but plant nutrients are lost by leaching during prolonged rains.

Cotton should be fertilized with from 250 to 600 pounds of a 6 8-4 or a 6-8-6 fertilizer per acre, and corn should be grown in rotation with cotton and fertilized with from 150 to 225 pounds of nitrate of soda, or its equivalent, unless it follows a winter cover crop, when no fertilizer is needed. Oats should receive about the same application of fertilizer as corn.

Kalmia loamy fine sand.—Kalmia loamy fine sand differs from Kalmia fine sandy loam in that it does not have so much clay in the subsoil and does not retain moisture and plant nutrients so well.

In cultivated areas it has the following profile characteristics:

0 to 6 inches, gray loamy fine sand containing a small quantity of organic matter
6 to 32 inches, grayish-yellow or yellow loamy fine sand.
32 inches +, yellow light fine sandy loam containing some mottlings of gray and pale yellow.

The entire soil is medium acid to strongly acid throughout.

Included with this soil are a few areas that would be separated as a deep phase of Kalmia loamy fine sand if they were larger. In these areas the soil differs from the typical soil in that the subsoil becomes light fine sandy loam at a depth ranging from 15 to 18 inches. In some areas the loamy fine sand extends to a depth of more than 40 inches.

This is not an extensive soil. Small bodies border the bottom lands along streams, principally the Sucarnoochee River, especially near Bellamy, along the Tombigbee River north of Belmont, and along the Noxubee River.

About 80 percent of this soil is cleared of its forest growth. Possibly 50 percent of the cleared areas is used for farm crops, and the rest is used for building sites, pasture, woodland, and other purposes. In general, Kalmia loamy fine sand occurs in slightly higher positions than the surrounding soils. Cotton and corn are the principal crops, and they yield from one-fourth to five-eighths of a bale and 8 to 20 bushels, respectively, per acre. These yields of cotton are obtained when from 200 to 300 pounds of a 3-8-5 or 4-8-4 fertilizer are used with a side dressing of 100 to 150 pounds of nitrate of soda, and the yields of corn are obtained with applications of 75 to 200 pounds of nitrate of soda as a side dressing. The soil is suited also to peanuts, melons, peaches, oats, soybeans, and cowpeas.

The incorporation of organic matter by growing winter legumes or summer legumes, or by summer fallowing, is the most economical method of improving this soil. Some of the farmers fallow the land 1 or 2 years out of every 4 to 6 years, allowing the native vegetation to enrich the soil. The use of winter legumes is preferred for this purpose, especially where farm land is scarce. Yields of corn are increased from 10 to 20 bushels per acre following a winter cover crop.

CALCAREOUS SOILS SUITED TO PASTURE, CORN, OATS, AND HAY

The calcareous soils suited to pasture, corn, oats, and hay constitute 14.2 percent of the total area of the county. They are true Black Belt soils and are the only alkaline soils in the county. Chalk and marl are the parent materials from which these soils have developed. Strong work animals are required to till them satisfactorily. These soils are suited only to the crops that are adapted to calcareous soils; they are best suited to pasture grasses, hay, and grain crops.

SOILS OF THE UPLANDS

The Black Belt soils developed on the uplands include Houston clay, Sumter clay, Sumter-Oktibbeha clays, and Sumter-Oktibbeha clays, rolling phases. Sheet erosion is a serious problem on these soils.

Houston clay.—Houston clay, commonly known as black prairie land or black crawfish land, is the only black or dark-brown upland soil in the Black Belt.

In open areas the following profile characteristics are observed:

0 to 25 inches, dark-brown heavy clay that appears black when wet. When moderately dry the soil breaks into fine granules under pressure, but when wet it is very sticky. Some fine lime nodules are present in places.

25 to 36 inches, dark olive-drab or greenish-yellow heavy plastic clay. Some lime nodules are present in the lower part.

36 to 50 inches, dark grayish-yellow plastic clay with an olive-green cast containing many lime nodules. Near the underlying chalk, which lies from 50 to 72 inches below the surface, the soil becomes a brighter yellow and the lime nodules are more abundant.

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Although the reaction of the entire soil is slightly alkaline, that of the subsoil is about neutral.

Included with this soil are a few small areas of Bell clay and some bodies of eroded Houston clay. The Bell clay areas occur in depressions and basins, and the eroded Houston clay occurs on knolls or low-lying ridges, where erosion has been active.

The typical relief of Houston clay is nearly level, gently undulating, or very gently sloping. Surface drainage ranges from fair to good, but internal drainage is rather poor. The heavy texture of the soil, which hinders the percolation of water, together with the slightly sloping relief, is conducive to severe sheet erosion when the soil is used for clean-cultivated crops. Terraces and a cover crop or sod are necessary measures for the control of sheet erosion in most areas.

The largest areas of this soil are south and southwest of Gainesville, northwest and northeast of Panola, and northwest of Geiger. Smaller bodies are scattered over the northern part of the county. Most of the areas, especially the larger ones, are infested to a great extent with crawfish, which are very detrimental to crops.

This soil is well suited to the production of Johnson grass, Dallis grass, black medic, partridge-peas, white Dutch clover, and hop clover. Lespedeza grows in a few locations, but it tends to develop chlorosis. Many areas are used for the production of general farm crops, principally corn, oats, cotton, and some hay. Before the boll weevil became prevalent this soil was considered the best in the county for the production of cotton, as yields ranging from ½ to 1 bale per acre were obtained without the use of fertilizers. Cotton usually is planted later than on the sandy soils, as this soil can be worked satisfactorily only under a very narrow range of moisture conditions. It also warms slowly and produces large stalks, which make the crop susceptible to injury from the boll weevil.

Sumter clay.—Sumter clay, locally known as gray lime prairie, is formed from partly weathered and crumbled limestone or chalk, generally known as rotten limestone. In a few areas the surface soil somewhat resembles Houston clay or Bell clay, but, in general, it is much lighter colored, owing to the higher content of lime in the surface soil as well as in the subsoil. The reaction is strongly alkaline throughout.

In most areas it has the following profile characteristics:

0 to 6 inches, dark-gray calcareous granular clay.
6 to 20 inches, creamy-gray highly calcareous clay.
20 to 36 inches, weathered crumbled chalk material.
36 inches +, partly weathered chalk grading into blue or grayish-blue hard chalk at a depth ranging from 3 to 6 feet.

The surface layer varies from place to place, according to the extent to which erosion has taken place and the cultural methods. The depth ranges from 2 to 8 inches and the color from nearly white to almost black. In places where the soil has been cropped continually and very little organic matter has been returned to the land or where the surface soil has been allowed to erode more rapidly than the organic matter accumulates, the surface soil ranges from gray to almost white; but where it has been kept largely in grasses or where erosion has been controlled so as to allow the soil to accumulate organic matter from decaying roots and surface vegetation or from added vegetable materials, the surface soil is dark gray or black.

This soil is granular and friable under favorable moisture conditions, but it is sticky and slippery when wet. It is the only soil of the Black Belt that will scour off a plow when moist.

Included with this soil in mapping are outcrops of chalk where the soil material has been completely removed by erosion. A few small areas of Vaiden clay and Oktibbeha clay, too small to separate on the map, also are included.

Sumter clay is fairly extensive. It is developed principally within a belt extending from Epes through Sumterville to Emelle. Other areas are north of Panola and west of Geiger. The slope ranges from 1 to 6 percent, giving the soil excellent to excessive surface drainage. Internal drainage is good. The gently undulating to sloping relief, together with the slowly pervious character of the soil, makes it very susceptible to sheet and gully erosion. Terracing is the first requirement for conservation of this soil. After erosion has been checked by terraces, the soil can be improved by turning under leguminous crops that have been heavily fertilized with phosphate fertilizers.

The predominant agricultural enterprise on Sumter clay is the raising of beef cattle. Dairying also is important in a few areas in the northern part of the county and near Epes. Such crops as corn, oats, hay, and pasture grasses, therefore, are very important to the farmers. This soil is well suited to alfalfa under proper management, but it is best suited to Dallis grass, white Dutch clover, Johnson grass, and black medic for pasture.

Like Houston clay, Sumter clay at one time was considered a desirable soil for the production of cotton, but infestation of the boll weevil and erosion resulting from clean tillage have changed the utilization of this soil.

Sumter-Oktibbeha clays.—Sumter-Oktibbeha clays represent a condition in places where Sumter clay is so closely associated with Oktibbeha clay, Vaiden clay, and, to less extent, Houston clay, Eutaw clay, and Bell clay that no definite type separation is possible. Sumter clay is associated also with Vaiden fine sandy loam and Oktibbeha fine sandy loam. In the areas north and northeast of Livingston and north of Epes, the relief is undulating to gently sloping. The color of a newly plowed field generally ranges from the very light gray of Sumter clay to the brownish gray of the Vaiden soils, the reddish brown of the Oktibbeha, or the black of Houston clay and Bell clay. The total area of this complex of soils is not large. Most of the individual areas are in the northern part of the county.

The slope ranges from 1 to 7 percent and averages about 3 percent. Surface drainage ranges from good to excessive. Internal drainage is good in the areas of Sumter clay and is fair to good in the other soils composing this classification. The heavy texture of the soil, together with the relief, causes it to erode very rapidly. The growing of sod crops or close-growing crops is necessary to check erosion. Terracing is helpful, even in sodded areas, as the terraces not only aid in preventing erosion but also help in conserving moisture for vegetation.

The Sumter-Oktibbeha clays occur in two fairly distinct situations: one is the result of erosion and the other is the result of deposition. The first situation is on the broad flat divides or gentle slopes where the Sumter clay or chalk material has been exposed in spots or strips, principally by sheet erosion. The second is a spotted colluvial deposition of Sumter clay or fragmented chalk material over lower lying Vaiden and Oktibbeha soils. In places, the second process has deposited both calcareous and acid material in more or less distinct spots. The soil in the eroded situations resembles the soil formed over deposited material. Agriculturally, however, it is inferior because it has been impoverished by the loss of part of or all the surface soil, some of the more available plant nutrients, and practically all of the accumulated organic material; whereas the latter soil has been enriched in these respects. About 35 percent of the soils resulting from erosion and about 75 percent of those resulting from deposition are under cultivation. The principal crops are cotton, corn, sugarcane, and hay. Cotton is the main crop on the higher ground, and yields range from one-fifth to three-fifths of a bale an acre, depending on the season and the cultural methods. Corn, sugarcane, and hay are grown on the lower areas. Corn yields from 10 to 20 bushels an acre under ordinary care and from 20 to 35 bushels when it follows a green-manure crop of winter legumes. Hay, especially Johnson grass, does very well in fields where the weeds and broomsedge are kept out. Yields of sugarcane are satisfactory.

Most of the uncultivated areas of this soil are used for pastures in which various clovers, Johnson grass, Bermuda grass, Dallis grass, lespedeza, and broomsedge grow. In places, fairly large abandoned areas, formerly under cultivation, are now covered with broomsedge and lespedeza in the areas of the Vaiden and Oktibbeha soils, and with various clovers, Johnson grass, and other lime-loving plants in the areas of the Sumter soils. A few small areas are growing up to forest, with shortleaf and loblolly pines predominating on the acid soils and cedars, hackberry, and redbud on the calcareous soils.

The soils composing this classification range from acid to alkaline, and the crop adaptations and to a certain extent the fertilizer requirements vary considerably. The management of individual areas should be governed by the predominating soil, the requirements of which are discussed in other parts of this report.

Sumter-Oktibbeha clays, rolling phases.—Sumter-Oktibbeha clays, rolling phases, differ from Sumter-Oktibbeha clays in that they have more rolling relief. This mixture of soils occurs north and northwest of Emelle, north of Epes, and west of Sumterville, and consists largely of Sumter clay, Vaiden loam, Vaiden fine sandy loam, Vaiden silty clay, and small areas of Oktibbeha soils. Only a small total area is mapped, of which only about 15 percent is in cultivation and most of the rest is in open pasture or woodland pasture.

The best agricultural use of this mixed soil is in the production of hay and pasture in support of livestock raising. Clean-cultivated crops, particularly cotton and corn, should not be grown. The production of cedar posts is probably the best utilization of the more severely sloping to hilly or badly eroded areas. Pines and lespedeza are grown on the red clay areas. Some of the more gently sloping areas can be terraced economically and planted to pasture grasses. Heavy phosphate fertilization is necessary for legumes.

SOILS OF THE BASINS AND OVERFLOW BOTTOMS

The second subgroup of Black Belt soils comprises Bell clay and Bell clay, flat phase, developed on terraces, and Catalpa clay, Catalpa clay, sanded phase, and Catalpa clay, high-bottom phase. These soils are not subject to erosion but are subject to more or less flooding.

Bell clay.—Bell clay is a dark-colored soil occurring at comparatively low elevations in association with Sumter, Houston, Vaiden, and to some extent the Eutaw and Lufkin soils. It occupies gentle converging slopes around the heads of drainageways, which in places extend nearly to the crests of the low flat divides; it occurs also near the bases of gentle slopes and in places at the bases of steep slopes in benchlike positions just above the bottom lands of adjoining streams. It is formed partly from colluvial and partly from alluvial materials brought down by excess run-off water from the neighboring uplands. It has developed predominantly under a grass cover and to less extent under a forest cover of hackberry, hickory, elm, and redbud, together with some water oak, cottonwood, and poplar along the shallow natural drainageways.

Bell clay in general has the following profile characteristics:

0 to 18 inches, very dark gray or nearly black clay that is plastic when wet but crumbles easily to coarse granules when dry. Lime fragments are present in places in the areas surrounded by Sumter clay.

18 to 30 inches, dark olive-drab or dark-brown plastic clay. The material in this layer is slightly more plastic than that in the layer above. Some small nodules and lime fragments are present in places. The material in this horizon is variable and in many places is the same as the surface soil.

30 to 40 inches, yellowish-gray or greenish-yellow plastic clay. This material continues to a depth ranging from 4 to 6 feet, where it grades into the underlying chalk.

The reaction is alkaline to neutral throughout.

The depths of the different horizons vary greatly, especially where the adjoining upland soil is Sumter clay. On very gentle slopes the soil boundaries between Sumter clay and Bell clay and, in some places, between Houston clay and Bell clay are arbitrarily drawn. Adjoining the areas of Sumter clay, the outer rim of Bell clay has a very shallow covering of soil material over the chalk, whereas the middle part of the area has a covering several feet thick. In the large fairly flat areas of Bell clay the depth of the soil material over the chalk is generally 40 or more inches, but on slopes the depth in few places reaches 40 inches and more commonly ranges from 15 to 30 inches.

This is a very desirable soil for agriculture. The larger areas are scattered throughout the northern part of the county and in the section east of Coatopa Creek, extending to the Tombigbee River.

This soil, in part, is subject to flooding by the streams, and a considerable part of it is subject to flooding by run-off from nearby slopes during heavy rains. Surface drainage and subsoil drainage tend to be slow, although they are ample for summer crops and generally ample for winter crops. Artificial drainage may be necessary in some locations for winter and early spring crops.

This is an excellent soil for the production of pasture grasses, corn, and hay crops and is used largely for these purposes. The crop and fertilizer recommendations are about the same as for Houston clay. Yields in general are higher than those obtained on Houston clay.

Bell clay, flat phase.—Bell clay, flat phase, occupies very gently sloping to nearly level areas at slightly higher elevations than the adjoining bottom lands (Catalpa clay). These areas are subject to overflow for short periods during times of very high water. They receive wash from highly calcareous material or overflow waters from lateral streams that originate in the chalk areas. This soil is not so well drained as is Bell clay.

It has the following profile characteristics:

0 to 18 inches, very dark gray or almost black clay, which is plastic when wet but crumbles into a coarse-granular structure when dry. Lime fragments are present in some areas closely associated with Sumter clay.
18 to 30 inches, material similar to that above but slightly lighter in color and more sticky.
30 inches +, greenish-gray or olive-drab sticky clay. Chalk lies at a depth ranging from 4 to 6 feet.

This flat soil is predominantly a clay, but some areas that receive wash from fine sandy loam areas contain enough fine sand in the surface soil to make the texture loam or clay loam. In a few places the subsoil is heavy plastic fine sandy clay. North of Bodka Creek 5 miles north of Emelle, the following profile is representative:

0 to 6 inches, heavy black loam.
6 to 10 inches, black silty clay loam.
10 to 16 inches, black clay faintly mottled with brown and containing small proportions of fine sand and very fine sand, which decrease with depth.
16 to 34 inches, black heavy somewhat plastic clay containing some mottlings of brown.
34 inches +, dark bluish-gray material with the same texture as that above.

In plowed fields the dry surface soil is dark gray.

The principal bodies are along Bodka Creek, Factory Creek, Fenache Creek, and Coney Creek. Soil of this phase is much less extensive than the typical soil.

Surface drainage is normally fair to good, except during overflows, and internal drainage is sufficient for the production of most summer crops. From 50 to 75 percent of the area is used for the production of corn, soybeans, Johnson grass, and cotton, and the rest is used for pasture, for which the land is particularly well suited. The pasture grasses are largely Dallis grass, black medic, hop clover, and white Dutch clover.

Catalpa clay.—Catalpa clay is an alluvial bottom-land soil composed of material washed largely from the Houston and Sumter soils of the true Black Belt areas and deposited along the stream channels. The Vaiden and Oktibbeha soils also have influenced this soil in places. It is subject to frequent overflows during winter and to occasional overflows during spring and summer. Its position is lower than that of Bell clay, with which it is associated in many places.

It has the following profile characteristics:

0 to 5 inches, dark grayish-brown clay or silty clay that appears black with a green cast. The material is sticky when moist or wet and checks and cracks when dry.
5 to 36 inches, dark brownish-gray or dark olive-drab heavy clay that appears black in places. This material also is plastic and sticky when wet and checks to a blocky structure when dry.

36 inches +, light grayish-yellow heavy clay mottled with light gray and rusty yellow. This soil rests on chalk at a depth ranging from 6 to 8 feet.

The reaction is neutral to slightly alkaline.

On account of their small individual size a few areas of Catalpa clay, high-bottom phase, are included with this soil on the map.

Catalpa clay occurs on rather broad bottoms along the streams that head or flow out of the true Black Belt soils. Most of Catalpa clay has been influenced in color and to some extent in texture by the color and texture of the surrounding soils from which the material is derived.

Areas border the drainageways throughout the northern two-thirds of the county. The broadest ones are along Bodka, Factory, and Looksookolo Creeks and southeast of Epes. The total area is large.

This is one of the important agricultural soils in the prairie section. Probably more than 25 percent is improved by drainage and is used in the production of such crops as cotton, corn, sorghum, and peas. In the narrow bottoms, drainage is best improved by straightening the channels and in the wide bottoms, by both shortening the main channel and putting in side ditches.

Yields of cotton are uncertain because the crop is later on the heavy soils and therefore is subject to greater damage from the boll weevil. Floods in early fall also may cause severe losses. Because the yield is good in favorable seasons, considerable cotton is planted on Catalpa clay despite these hazards. Corn yields range from 20 to 50 or more bushels per acre depending on the season. Fertilizers are seldom used. Hay, especially Johnson grass, is produced on nearly 50 percent of the area of Catalpa clay, and the yields are very good. The rest of the land is devoted principally to improved pasture of Dallis grass, carpet grass, white Dutch clover, and other clovers and grasses. A few of the well-drained areas are planted to pecan orchards. Small areas of Catalpa clay in woodland pasture support a forest growth, chiefly of hackberry, various oaks, hickory, elm, ironwood, sycamore, poplar, and cottonwood. Except for those crops subject to drowning during winter, the crop and fertilizer requirements of this soil should be the same as for Houston clay.

Catalpa clay, sanded phase.—Catalpa clay, sanded phase, is very similar to typical Catalpa clay except that it has received an overwash of sandy material. The depth of the sandy deposit ranges from about 3 to 10 or more inches and averages about 5 inches. In most places this soil occupies the upper parts of the bottom lands near the heads of streams or drainageways, but in a few places, especially where the streams originate in the so-called sand hills east and north of Livingston, it occurs on the wide bottoms farther down the streams. At the heads of the drainageways it is used principally for the production of the same crops as those planted on the typical soil, but a larger proportion is used for cotton and the yields average better than on that soil. Corn, hay, and other crops return excellent yields. The land is seldom fertilized, but an application ranging from 200 to 300 pounds of a commercial fertilizer high in phosphate and potash and low in nitrogen probably should be used in preparation for cotton. Farther down the stream, high water is very destructive to the soil when tilled, and here the land is best utilized in the production of soybeans and Johnson grass and for pasture. Dallis grass, lespedeza, and hop clover supply most of the grazing in these locations. An application ranging from 200 to 400 pounds of superphosphate should be profitable for the pasture crops and soybean hay.

Narrow strips of this soil border the smaller drainageways, principally in the central part of the county. Their total area is not large.

Catalpa clay, high-bottom phase.—Catalpa clay, high-bottom phase, occurs in the areas where Sumter clay, eroded phase, and Sumter-Vaiden complex, hilly phase, predominate. It occupies comparatively small bodies within the areas extending southward from Bodka Creek to the Sucarnoochee River and eastward to the Tombigbee River. This soil occupies narrow strips of bottom lands along the upper end of small fingerlike drainageways that originate in the chalk formation, and it consists principally of the raw crumbled chalk material washed from the uplands. The depth of this newly deposited material ranges from less than a foot in places to more than 15 feet in others. It is subject to overflow during very heavy downpours, but the water does not remain long on the surface. Ordinarily, the stream channels lie from 4 to more than 10 feet below the surface. Drainage is fairly good or good, both externally and internally, owing to the crumbly character of the soil material and to the depth of the drainage channels.

The surface soil is gray or dark-gray clay consisting of recent deposits of crumbled chalk material. In some places the material has had time to accumulate organic matter, but in other places it has not. The subsoil is gray chalky clay consisting principally of crumbled chalk or soft limestone, together with accumulations of organic matter.

This soil is not so extensive as the typical soil. Only a small proportion of it is in cultivation because of the great danger of erosion during heavy downpours. The cultivated part generally is around the upper ends of the drainageways, where the channel ordinarily takes care of the run-off, especially during the growing season. The principal crops are corn, soybeans, and Johnson grass. Diversion ditches cut near the bases of the hills in many places are sufficient for the reclamation of this soil.

This soil is well suited and is used largely for pasturing livestock. It is highly calcareous and favorable for the production of Dallis grass, hop clover, white Dutch clover, and black medic. Alfalfa also is well adapted in the better drained areas. The soil has essentially the same crop adaptations as Houston clay, and it is better suited to alfalfa and oats than that soil.

ACID SOILS SUITED TO FOREST, PASTURE, AND FARM CROPS

The acid soils suited to forest, pasture, and farm crops, locally called post oak prairie, are recognized as the heaviest and most sticky in the county, and they constitute 19.1 percent of the total area. Their high content of clay also makes them difficult to till (requiring strong work animals); and farm operations are delayed in the spring, pending favorable moisture conditions. They check and crack to a great extent on drying, are very acid in reaction, and require a large quantity of lime for the satisfactory production of crops. Phosphate fertilizers are fixed readily when placed in contact with the soils. Despite the nearly level to gently sloping surface, sheet erosion is a problem in cultivated areas, owing to the heavy texture of the soil. Terracing is not generally practiced on these soils, but it is needed even on nearly level land when used for clean-cultivated crops. Otherwise, the land should be well sodded to pasture grasses. It is often necessary to ridge Eutaw clay for the production of oats and winter cover crops, as these crops are subject to drowning on the soils of this group.

SOILS OF THE UPLANDS

The acid soils that are developed on the uplands include Vaiden loam, Vaiden silty clay, Eutaw clay, Eutaw loam, Wilcox clay, and Lufkin clay.

Vaiden loam.—Vaiden loam differs from Vaiden fine sandy loam mainly in the thinner sandy covering over the subsoil. Most of the subsoil was at one time more deeply covered, but enough of the loose, fine sandy surface material has been washed away to leave the soil in its present condition.

In cultivated areas Vaiden loam has the following profile characteristics:

0 to 5 inches, gray or grayish-brown friable very fine sandy loam or loam.

5 to 14 inches, yellow heavy rather stiff fine sandy clay, plastic and somewhat sticky when wet.

14 inches +, yellow or grayish-yellow plastic clay mottled with red, brownish red, and gray. The gray increases as the yellow fades with depth. Chalk is present at a depth ranging from 30 to 60 inches.

The soil is very strongly acid down to the underlying chalk, which is alkaline.

Small areas of Vaiden fine sandy loam, Vaiden clay, and Sumter-Oktibbeha clays, too small to separate on the map, are included with Vaiden loam.

The principal bodies of Vaiden loam are closely associated with areas of Vaiden fine sandy loam in the vicinities of Emelle, Hamner, Mount Pilgrim School, and Livingston, but their total area is not large.

The heavy texture of the subsoil, together with the gently sloping relief, makes this soil very susceptible to sheet erosion. Well-constructed terraces are needed for conservation of the soil.

Probably from 50 to 60 percent of this soil is cultivated. Cotton, hay, and oats are the principal crops, and most of the rest of the land is used for pasture. Cowpeas, velvetbeans, sorghum, peanuts, Johnson grass, and some corn are grown. The principal pasture vegetation includes lespedeza, carpet grass, Bermuda grass, Dallis grass, and hop clover. The few wooded areas support largely shortleaf pines.

Experiments on crops, grasses, and fertilizers have been conducted on Vaiden clay and other associated soils at the Black Belt Substation of the Alabama Agricultural Experiment Station at Marion Junction and the results are discussed in group 4 of the section on land uses and agricultural methods of this report. Vaiden loam is easier to handle and somewhat more responsive to fertilizers than is Vaiden silty clay, but the same recommendations apply to both soils.

Vaiden silty clay.—Vaiden silty clay is locally known as yellow prairie. It is closely associated with Vaiden fine sandy loam, Vaiden loam, Oktibbeha clay (mapped in the Sumter-Oktibbeha clays complex), and the true Black Belt, or lime soils. It differs from Oktibbeha clay principally in color and in depth to the underlying chalk. The Vaiden soils are yellow, whereas the Oktibbeha soils are brownish red.

The profile characteristics of Vaiden silty clay in cultivated areas are as follows:

0 to 6 inches, brownish-yellow or brownish-gray clay or silty clay, which is plastic and sticky when wet.
6 to 12 inches, yellow slightly plastic clay faintly mottled with gray and shades of brown.
12 to 30 inches, yellow plastic clay intensely mottled with gray and brown. The gray increases with depth.
30 inches +, gray very heavy plastic clay intensely mottled with shades of brown and yellow. Lime is present at a depth ranging from 40 to 60 inches.

In some places small areas of Oktibbeha clay are included with Vaiden silty clay because of the small total area of Oktibbeha clay occurring in this county. This clay can be seen near Epes, northeast of Panola, and north of Belmont. A few small areas of Vaiden loam and Eutaw clay are included.

Some bodies of this soil are fairly large; others are small and scattered. The larger ones are near Gainesville, Bodka, and Panola.

Vaiden silty clay occupies practically level to gently undulating broad divides. Surface drainage, therefore, ranges from good to excellent; internal drainage, however, is slow, owing to the heavy-textured subsoil. The slightly sloping to sloping relief, together with the high clay content, makes this soil susceptible to erosion. Most of it should be terraced carefully and, in addition, should be kept in sod or planted to some close-growing crop.

The most important use of this soil is for pasture. If protected from weeds and coarse sedge grasses, a fairly good sod of Dallis grass, lespedeza, carpet grass, hop clover, and Johnson grass will establish itself. About one-third of this soil lies idle in so-called straw fields or is grown up to brush and young post oak. Some areas support a fair to good stand of timber, mainly loblolly pine, post oak, water oak, hickory, and sweetgum. Probably less than 20 percent is in cultivation. Cotton and oats are the principal crops grown. Yields of cotton range from one-fifth to one-half of a bale an acre, and of oats from 10 to 30 bushels, depending on the soil management. Corn seldom is planted alone, but when it is planted at all it is planted in rows across the cottonfields at wide intervals. Considerable experimental work has been done on this soil by the staff of the Black Belt Substation at Marion Junction. The results as obtained by this station regarding adapted crops and fertilizers for this soil are discussed in detail in group 4 of the section on land uses and agricultural methods.

Eutaw clay.—Eutaw clay commonly is known as gray post oak prairie. It is also known as hog-wallow land because of the numerous small depressions, which range in depth from 6 to 18 inches and in diameter from 3 to 8 feet.

In cultivated areas it has the following profile characteristics:

0 to 4 inches, brownish-gray plastic clay, which is sticky and plastic when wet, checks and cracks when dry, but is easily tilled under favorable moisture conditions.

4 to 6 inches, grayish-yellow plastic clay, which is sticky when wet but fairly friable under favorable moisture conditions. This layer is generally present in all except the eroded areas.

6 to 30 inches, gray plastic clay mottled with yellow, rusty brown, and red.

30 inches +, bluish-gray plastic clay mottled with yellow, red, and brown. This material is underlain by chalk at a depth ranging from 4 to 8 feet.

The reaction is very strongly acid throughout.

As mapped, this soil includes small areas of Vaiden clay, Lufkin clay, and Eutaw loam that are too small to separate on a small-scale map. In some places, especially south and southwest of Emelle, it also includes small bodies of Eutaw silt loam or Eutaw silty clay that are too intricately mixed with the clay to make a separation practical.

Eutaw clay occurs as large continuous areas south and west of Emelle and 3 or 4 miles southwest of Gainesville. A few small areas are in the extreme northwestern part of the county and near Coatopa.

This soil occurs in broad flat to gently sloping areas. External drainage is good in some places, but internal drainage invariably is slow. In the gently sloping areas there is sufficient movement of water to cause considerable sheet erosion and some gully erosion. Practically all of the cultivated areas should be carefully terraced, as terraces not only check erosion but also aid in the uniform distribution of water.

This soil is difficult to manage, as it has a narrow range in moisture content. Very little fertilizer is required to produce a fair crop of cotton during favorable years, and considerable areas are devoted to that crop despite the difficulty experienced in tillage. Corn, hay crops, sorghum, sugarcane, garden vegetables, and field peas are grown. Approximately 20 percent of the land is in cultivation, 30 percent in open pasture, and 50 percent in forest and range-land pasture. Winter cover crops and oats are subject to injury from drowning and freezing, but these hazards may be overcome in part by ridging or terracing the soil. The largest areas in cultivation are those south and southwest of Emelle. The soil in these areas differs from typical Eutaw clay in having a covering of silt loam or silty clay loam, which makes it more easily tilled; but the primary reason for its better adaptation to cultivation is its better natural surface drainage. Lespedeza, Dallis grass, carpet grass, and hop clover supply most of the grazing. In the forested areas are sweetgum, old-field pine, post oak, blackjack oak, water oak, southern red oak (Spanish oak), and hickory, together with several other varieties of trees.

Eutaw clay has a rather wide crop adaptation, but its practical utilization is somewhat handicapped by the fact that it warms slowly in the spring. The maturity of cotton is delayed as the result of this, thereby increasing damage from the boll weevil. A large part of this soil has reverted to forest and pasture since the infestation by the boll weevil.

The fertilizer and crop recommendations based on the results obtained from experiments on this and related soils at the Black Belt Substation at Marion Junction are discussed in detail in group 4 in the section on land uses and agricultural methods.

Eutaw loam.—Eutaw loam differs from Eutaw clay principally in the texture of the surface soil. It, also, is known as gray post oak prairie and in a few locations as hog-wallow land. Eutaw loam is intermediate between Eutaw clay and such sandy soils as Vaiden fine sandy loam or Ruston fine sandy loam. The texture ranges from fine sandy loam near the sandy areas to clay loam near the clayey areas. The depth of the sandy or loamy material ranges from 4 to 8 inches. In the main, the soil has the following characteristics:

0 to 5 inches, grayish-brown loam or fine sandy loam.
5 to 7 inches, grayish-yellow friable heavy fine sandy clay, which is somewhat sticky when wet.
7 to 30 inches, gray plastic clay mottled with yellow, rusty brown, and red. More fine sand is present in this layer than in the comparable layer of Eutaw clay.
30 inches +, bluish-gray plastic clay mottled with red, yellow, and brown. Chalk is present at a depth ranging from 5 to 10 feet.

The soil is strongly acid throughout.

Surface and internal drainage are poor and limit the agricultural utilization of this soil. Ordinarily, Eutaw loam is slightly more desirable for cultivation than Eutaw clay, but the latter soil occurs in larger and more uniformly better drained bodies. In the tilled areas, which comprise only a small proportion of the total area, the cropping and tillage practices are similar to those followed on Eutaw clay. Cotton, sugarcane, and soybeans are the principal crops, and some corn, peanuts, and velvetbeans are grown. Many areas that were at one time in cultivation are now being used as range land, forest, or pasture. Carpet grass, Dallis grass, lespedeza, and hop clover are the principal pasture plants. The forested areas produce largely post oak, together with some old-field pine, sweetgum, water oak, hickory, and a few other hardwoods.

Recommended crops and fertilizer practices for Eutaw loam are essentially the same as for Eutaw clay. A large amount of experimental work has been done on Eutaw clay on the Black Belt experiment station at Marion Junction, the results of which are discussed in detail in group 4 of the section on land uses and agricultural methods.

Wilcox clay.—Wilcox clay occurs as a border soil surrounding large areas of Lufkin clay or as a better oxidized soil on the knolls or slopes, which are within the Lufkin clay area. The soil is developed from the indurated clay that also gives rise to the Lufkin soil. In color, general soil characteristics, and utilization, Wilcox clay is very similar to Susquehanna clay as mapped in nearby counties.

In cultivated areas it has the following profile characteristics:

0 to 5 inches, brown clay or clay loam.
5 to 20 inches, red plastic clay containing some yellow, gray, and brown mottlings.
20 inches +, gray plastic clay intensely mottled with brown, red, and yellow. At a depth ranging from 40 to 50 inches it grades into the partly decomposed hard clay.

The soil is very strongly acid to strongly acid in reaction.

Included with this soil are a few small areas of Lufkin clay and Wilcox fine sandy loam, which are too small to show on the map.

Wilcox clay lies mainly within a belt beginning at the point where the Sucarnoochee River enters the county and continuing southeastward past York to the Tombigbee River. The relief is undulating to gently sloping and subjects the cultivated soil to considerable erosion. Terracing and close-growing crops are needed for the conservation of this soil in those places where it is not sodded for pasture or used for forest.

Much of this soil was in cultivation, principally to cotton, from 20 to 30 years ago. Practically all of the farmed areas have been abandoned and are now producing excellent stands of young shortleaf pine and loblolly pine, together with some hardwoods, principally sweetgum and post oak. In the uncleared areas, there is considerable post oak, loblolly pine, and hickory, also some white oak, red oak, and other trees. The areas used for pasture support largely carpet grass, Dallis grass, and lespedeza, also some partridge-peas. Crop yields on this soil are normally low, and, in general, it is best utilized for forest or pasture.

Lufkin clay.—Lufkin clay is somewhat similar to Eutaw clay. It differs from that soil principally in that the subsoil is lighter gray and is less highly mottled than the corresponding layer of the Eutaw soil, and the underlying material is heavy clay instead of Selma chalk. Neither of these two formations, however, affects the use or fertilization of the soil. Like the Eutaw soil, Lufkin clay is known as gray post oak prairie and hog-wallow land.

In cultivated areas it has the following profile characteristics:

0 to 4 inches, gray-brown or brownish-gray clay, which is sticky and plastic when wet but granular under favorable moisture conditions.

4 to 6 inches, grayish-yellow clay, which is sticky when wet but fairly friable under favorable moisture conditions. This layer is not everywhere present.

6 to 40 inches +, light-gray heavy plastic clay containing some mottlings of red, brown, and yellow, but the mottlings are not so abundant as in Eutaw clay. At a depth ranging from 4 to 6 feet, this material grades into indurated heavy clay of the Sucarnoochee formation.

The reaction is very strongly acid.

Small areas of Wilcox clay and Vaiden clay are included with areas mapped as Lufkin clay. Also, the line of demarcation between this soil and Eutaw clay is in many places difficult to locate; consequently some areas of Eutaw clay are mapped as Lufkin clay.

This soil occurs in large areas in the belt that enters the county southwest of Emelle and continues southeastward toward the Tombigbee River. It is the most extensive soil in the county.

This soil occupies nearly level to gently sloping areas; consequently surface drainage is poor. Internal drainage also is poor, owing to the heavy texture of the soil. In the gently sloping areas there is sufficient movement of water to cause some sheet and gully erosion. The erodibility is attributed to a high content of clay, causing the soil to remain in suspension a long time and to absorb water slowly.

Lufkin clay is a difficult soil to manage, and only the better drained areas are selected for cultivation. Cotton is the major crop and returns fair yields during favorable years, with very small applications of fertilizer. This was particularly true before infestation by the boll weevil, but since the appearance of this pest the use of fertilizer to hasten the development and maturity of cotton has become necessary. Delayed crops are injured seriously by the boll weevil. Since the appearance of the boll weevil large areas of this soil have been converted into pasture, range land, and some forest land. At present approximately 10 percent of the land, mainly southwest of Emelle and north of Boyd, is farmed. In the southern part of the county this land comprises a large part of a forest and game preserve. The virgin forest consists mainly of post oak and other hardwoods, together with both shortleaf and longleaf pine. In addition to cotton, some corn, soybeans, sorghum, sugarcane, and garden vegetables are produced. In most of the areas winter cover crops and oats are subject to injury by drowning and freezing, but these hazards may be overcome in part by ridging or terracing the soil.

Some areas of this soil are used for pasture, in which the principal plants are lespedeza, Dallis grass, hop clover, carpet grass, and partridge-peas. In the forested areas post oak and hickory, together with sweetgum and other hardwoods, are the principal trees, but some shortleaf pine and longleaf pine also grow.

Considerable experimental work has been done on Lufkin clay on a field at Gastonburg, the results of which are discussed in detail in group 4 of the section on land uses and agricultural methods of this report.

SOILS OF THE TERRACES

The terrace phases of Vaiden loam, Eutaw clay, and Eutaw loam comprise the second subgroup of acid soils suited to forest, pasture, and farm crops.

Only a small total area is mapped, mainly north of Bodka Creek 5 miles north of Emelle.

Vaiden loam, terrace phase.—Vaiden loam, terrace phase, differs from Vaiden loam in that it occurs on terraces or in low-lying positions, adjacent to the creeks or first bottoms. Most of it lies above overflow, but some areas along Bodka Creek and other large streams are overflowed during periods of very high water.

This soil has the following profile characteristics:

0 to 5 inches, gray or grayish-brown friable loam.
5 to 14 inches, brownish-yellow friable clay loam, containing a large quantity of fine sand; somewhat more friable than the corresponding layer of Vaiden loam. The material is plastic when wet.
14 to 30 inches, yellow plastic clay mottled with gray and brown.
30 inches +, mottled gray, yellow, and brown plastic clay. Chalk generally is present at a depth ranging from 40 to 60 inches.

The soil is very strongly acid to strongly acid down to the underlying chalk, which is alkaline.

Mapped areas of this soil include small bodies of Vaiden fine sandy loam, terrace phase, Vaiden silty clay, Eutaw loam, terrace phase, Leaf clay, and Leaf fine sandy loam, which are too small to show separately.

Even though this soil occupies nearly level to gently sloping areas, it is subject to considerable erosion in clean cultivated fields because the heavy texture of the subsoil hinders the penetration of water.

Terraces generally are needed, as they aid in controlling erosion and also help in conserving moisture. The conservation of moisture is recommended in areas devoted to pasture as well as those used for general farm crops.

Probably 50 percent of this soil is in cultivation, and most of the rest is in pasture. Cotton is the predominating crop, and some corn, oats, velvetbeans, soybeans, peanuts, and other crops are grown. Yields of cotton normally range from one-fourth to three-fifths of a bale per acre; corn, from 10 to 20 bushels; and soybeans, from ½ to 1½ tons of hay. These yields may be increased by improved methods of cropping and fertilization. Areas used for pasture support principally lespedeza, carpet grass, Dallis grass, Bermuda grass, and hop clover. These crops should be fertilized with a liberal application of superphosphate or basic slag.

Experiments on crops, grasses, and fertilizers have been conducted on Vaiden clay and other associated soils on the Black Belt Substation at Marion Junction, and the results are discussed in group 4 of the section on land uses and agricultural methods of this report. Vaiden loam, terrace phase, is easier to manage, owing to its sandy surface soil, it absorbs rainfall more readily, and it probably is more responsive to management than typical Vaiden clay; otherwise the recommendations contained in the section referred to should be applicable to this soil.

Eutaw clay, terrace phase.—Eutaw clay, terrace phase, differs from Eutaw clay in that it occupies flat or very gently sloping areas situated slightly higher than the first bottoms along Bodka Creek, Factory Creek, and the Noxubee River and its branches. In places the areas are subject to overflow during very high waters.

A very small percentage of this soil is in cultivation. Most of it is in forest, range land, or pasture. Post oak, sweetgum, old-field pine, hickory, and other hardwoods constitute the principal forest growth, and a few other trees are common. In places, scattered cedars indicate the influence of lime. The most extensive pasture areas are north of Bodka Creek. These areas support good stands of carpet grass, Dallis grass, Bermuda grass, lespedeza, and some hop clover.

Recommendations regarding pasture grasses, crops, and fertilizer should be the same as for Eutaw clay, as crop adaptations and crop yields are similar to those of Eutaw clay.

Eutaw loam, terrace phase.—Eutaw loam, terrace phase, differs from Eutaw loam principally in the position that it occupies. Eutaw loam occurs on low-lying upland positions, whereas Eutaw loam, terrace phase, occupies low flat second bottoms that are subject to flooding during periods of high water.

This soil, like Eutaw loam, has a 4- to 6-inch surface soil of grayish-brown loam or fine sandy loam, underlain by a gray plastic clay subsoil that is intensely mottled with brown, red, and yellow. The soil is extremely acid throughout.

Some of the areas north of Jones Creek and along Turkey Creek are more sandy than typical but are included with this soil as their size does not warrant separation. These areas are better suited for agricultural use than the rest of the land.

Bodies of Eutaw loam, terrace phase, occur along Bodka Creek, Factory Creek, Jones Creek, and a few other streams. Their total area is small.

From 20 to 30 percent more of this soil than of Eutaw loam is in cultivation. About 50 percent is in pasture. Carpet grass, Dallis grass, and lespedeza supply abundant pasturage. The principal crops are sugarcane, sorghum, Johnson grass, soybeans, corn, and some cotton. Post oak, sweetgum, together with some old-field pine, compose the forest growth.

SOILS SUITED MAINLY TO FOREST, KUDZU, AND COVER CROPS

The soils of the group suited mainly to forest, kudzu, and cover crops represent 24.6 percent of the area of the county. They are sloping to rolling, ranging from 6 to more than 25 percent in gradient and are very subject to erosion, especially in cultivated areas. Before these soils were so severely eroded they were inherently good, and they still may be used satisfactorily for certain farm crops, especially kudzu or any crop that does not encourage further erosion. The more gentle slopes may even be used for clean-cultivated crops, provided the land is carefully terraced and strip crops are used. Most of the areas are well suited to the production of timber.

This group comprises Wilcox fine sandy loam; Wilcox clay, rolling phase; Ruston fine sandy loam, rolling phase; Ruston loamy fine sand, rolling phase; Cuthbert fine sandy loam, hilly phase; Vaiden fine sandy loam, rolling phase; Sumter clay, eroded phase; Sumter-Vaiden complex, hilly phase; and Guin soils, undifferentiated.

Wilcox fine sandy loam.—Wilcox fine sandy loam is closely associated with the Lufkin soils and, like those soils, is developed from the indurated clays of the Sucarnoochee formation. It is somewhat similar to Susquehanna fine sandy loam as mapped in nearby counties.

In cultivated areas it has the following profile characteristics:

0 to 5 inches, gray loamy fine sand or fine sandy loam containing a little organic matter in the upper part. Erosion has thinned the surface soil in many places.

5 to 22 inches, brownish-red clay, stiff and brittle when dry or moist but plastic and sticky when wet.

22 to 30 inches, reddish-brown plastic clay mottled with yellow, gray, red, and brown.

30 inches +, mottled yellow, red, rusty-brown, and gray very fine sandy clay or clay. This material is fairly friable but is extremely smooth and plastic. Partly weathered indurated clay occurs at a depth ranging from 3 to 5 feet.

The reaction ranges from strongly acid to very strongly acid.

Included with this soil on the map are many small areas of Wilcox clay. These were at one time Wilcox fine sandy loam but have lost their surface soil by erosion. The included soil is not so productive as the typical soil as it is more droughty and more difficult to till. Small areas of Cuthbert fine sandy loam also are included.

Wilcox fine sandy loam is developed principally south and west of the flatwoods within the belt extending from the point where the Sucarnoochee River enters the county southeastward to the Choctaw County line. It occupies some of the small plateaus and the more gently sloping ridge tops northwest of York and principally the lower more gentle slopes or fan-shaped areas that are below the steeper slopes north and west of York and throughout the rest of the belt.

The relief is choppy, undulating, and gently rolling. The surface configuration appears very irregular, even where the slope ranges from only 3 to 7 percent. Farm terraces should be short and irregular shaped, in order to conform to the surface features, and they should be extremely high to impound sufficient water for absorption by the heavy-textured subsoil. Only a small proportion of the land, however, is terraced.

Practically all of this soil on the high ridge tops and small plateaus and a large proportion of that in the lowest positions has once been farmed, but only 25 or 30 percent is now in cultivation. The crops grown are largely cotton, corn, and subsistence crops. Cotton yields from one-fifth to one-half of a bale per acre, depending on the depth of the surface soil and the quantity of fertilizer used. In general, farming practices are not conducive to large crop yields. The forest growth is principally old-field pine, together with some post oak, blackjack oak, and sweetgum. Many areas are used for range-land pasture, as carpet grass and lespedeza make fair growth on this soil in places where the trees have been removed.

Because the surface soil of Wilcox fine sandy loam is shallow and rests immediately on a heavy tough clay subsoil, the soil is very droughty under present cultural methods and is not well suited to crops that make their growth during the summer, particularly corn. It is best adapted to crops that make their growth during the period of high rainfall, as do oats, winter cover crops, or cotton. Cotton sheds its fruit to a great extent as a result of the extreme variations in the supply of moisture, and it normally returns low yields. Fair yields of oats and other winter cover crops are obtained under good management. Cotton should be fertilized with from 300 to 600 pounds per acre of a 6–8–4 mixture or its equivalent. If corn is grown, it should follow cotton and receive from 150 to 225 pounds per acre of nitrate of soda or its equivalent. Corn is more economically produced following a winter legume, such as Austrian Winter peas or vetch. Oats should be fertilized with from 100 to 200 pounds per acre of nitrate of soda, or its equivalent.

Wilcox clay, rolling phase.—Wilcox clay, rolling phase, differs from Wilcox clay in relief, susceptibility to erosion, and land use. The slope ranges from 5 to 20 percent, whereas that of the typical soil ranges from 1 to 5 percent. Both soils are used largely for forestry, but the more rolling soil is even more susceptible to erosion and is more extensively forested.

In forested areas this soil has the following profile characteristics:

0 to 6 inches, brown or reddish-brown clay or clay loam, in many places containing some fine sand. In cultivated areas this layer is thinner.

6 to 24 inches, red heavy tough clay, firm in place. When wet it becomes plastic and sticky. There are some mottlings of gray and yellow in the lower part of this layer.

24 inches +, mottled gray, red, and yellow plastic clay, the gray increasing with depth. The underlying indurated clay of the material of the Sucarnoochee formation is present at a depth ranging from 3 to 5 feet.

The soil ranges from acid to very strongly acid throughout.

Wilcox clay, rolling phase, includes small areas of a soil that would be separated as Cuthbert fine sandy loam, rolling phase, if it were more extensive. These two soils are very closely associated, are developed largely from the same type of parent materials, and have the same land use and capabilities for future use.

Wilcox clay, rolling phase, occurs in the section underlain by the Sucarnoochee clay formation, especially northwest and southeast of York and southwest of Whitfield.

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This soil is very susceptible to erosion, and it should be used for forestry or range-land pasture. At present, it is used almost entirely for the production of timber, with a few small areas left open for pasture land. The best grazing land is along the lower slopes and along small stream bottoms. Carpet grass, Dallis grass, and lespedeza supply most of the pasturage. These areas can be used to a certain extent for game preserves, as considerable feed grows on this soil. The management of forests is discussed in group 5 of the section on land uses and agricultural methods.

Ruston fine sandy loam, rolling phase.—Ruston fine sandy loam, rolling phase, has a more uneven relief, is much more susceptible to erosion, and is less uniform in soil characteristics than the typical soil. The slope ranges from 5 to 15 percent, and the soil characteristics range from those of the Ruston soils to those of the Cuthbert.

In cultivated areas the soil profile is as follows:

0 to 5 inches, brownish-gray or yellowish-gray loamy fine sand.
5 to 8 inches, grayish-yellow or brownish-yellow light fine sandy loam.
8 to 12 inches, yellowish-brown or brownish-yellow firm fine sandy loam, which is somewhat heavier than that in the corresponding layer of typical Ruston fine sandy loam.
12 to 30 inches, brown or rusty-brown friable fine sandy clay that contains somewhat more clay and is slightly heavier than the overlying material.
30 inches +, compact streaked light-red or yellow sandy clay.

The soil is strongly acid throughout.

Included with Ruston fine sandy loam, rolling phase, are small areas of soils that would be mapped as rolling phases of Red Bay fine sandy loam, Akron fine sandy loam, and Cuthbert fine sandy loam if their total area warranted the separation. The more prominent of these areas are those of the Red Bay soil, which differs essentially from Ruston fine sandy loam, rolling phase, in having a brown or reddish-brown fine sandy loam surface soil and a red heavy firm fine sandy clay subsoil. The Akron and Cuthbert soils have much heavier textured subsoils than Ruston fine sandy loam, rolling phase.

This rolling soil occurs on ridge crests and on slopes, in close association with typical Ruston fine sandy loam. Large areas are southeast of Cuba and northeast of Ward, and smaller ones are scattered over the southern part of the county. The included small areas of Red Bay fine sandy loam, rolling phase, are developed on the small high plateaus east and southeast of New Prospect Church. On account of the sloping to rolling relief, drainage ranges from good to excessive. Under clean cultivation, the soil is subject to severe sheet erosion and gullying.

From 20 to 30 percent of Ruston fine sandy loam, rolling phase, is under cultivation. A larger proportion of this soil is cultivated in the vicinity of York and northwest of Ward than elsewhere. The crops produced are similar to those grown on Ruston fine sandy loam, but yields generally are lower. The fertilizer requirements for this soil are discussed in the section on land uses and agricultural methods. A well-devised system of terraces is recommended on this rolling land, in order to control the run-off of excessive rainfall. Terraces are not recommended for the steeper parts, which should be used only for forestry. Kudzu should furnish excellent grazing on this soil and would completely control erosion when once established. The present tree growth consists of old-field pine (a shortleaf pine locally called loblolly), rosemary pine, red oak, white oak, black oak, and sweetgum. Most of it is second growth, as the original growth of merchantable timber has been cut.

Ruston loamy fine sand, rolling phase.—Ruston loamy fine sand, rolling phase, differs from typical Ruston loamy fine sand in that it occurs on slopes ranging from 5 to 15 percent.

The surface soil to a depth ranging from 14 to 20 inches is gray loamy fine sand or loamy sand, which grades into a brownish-yellow or light-brown loamy fine sand subsoil, which in most places continues to a depth of 48 or more inches but in places grades into reddish-brown fine sandy clay at a depth ranging from 30 to 35 inches. This soil is strongly acid throughout.

This soil includes small areas that would be separated as Norfolk loamy fine sand, rolling phase, and Norfolk fine sand, rolling phase, if they were larger, as well as a few small areas of hilly phases of Ruston loamy fine sand and Ruston loamy sand.

This soil is associated with the other Ruston soils in the southwestern part of the county, especially west of York, east of Cuba, and north and east of Ward.

The principal utilization of this soil is for the production of timber, mostly loblolly pine and scrub oak, together with considerable hickory, sweetgum, post oak, red oak, and poplar, as it is well suited for forestry. A small proportion of the land is in cultivation. The cultivated areas are in the more favorable situations where the slope in few places exceeds 8 percent. Crops and fertilizers are the same as for Ruston loamy fine sand.

Cuthbert fine sandy loam, hilly phase.—Cuthbert fine sandy loam, hilly phase, differs from Cuthbert fine sandy loam in that it occurs in broken to hilly areas where the slopes range from 6 to 25 percent, whereas the typical soil occurs in areas where the slopes range from 1 to 6 percent.

Erosion has been very active; consequently the surface soil ranges in thickness from a mere film to as much as 5 inches. The surface soil is grayish-brown sandy loam. This changes rather abruptly to brown, brownish-red, or reddish-yellow compact firm smooth clay containing many finely divided mica flakes. At a depth ranging from 20 to 30 inches the subsoil becomes mottled with some yellowish gray and gray, and at a depth ranging from 30 to 35 inches the compact clay subsoil becomes intensely marbled and mottled yellow, brown, and gray.

Several areas of Wilcox fine sandy loam, hilly phase, are included with this soil on the map, as the two soils are too similar in the broken areas to justify making separations. To some extent Wilcox fine sandy loam, hilly phase, predominates in the areas bordering areas of Wilcox clay and Lufkin clay, and Cuthbert fine sandy loam, hilly phase, predominates in the areas to the south and west of these soils; but the profiles vary from place to place and make it impractical to separate the soils. Some small areas of Wilcox clay, Wilcox fine sandy loam, Cuthbert fine sandy loam, and Guin soils, undifferentiated, which are too small to separate on a map of the scale used, are also included. Several small bodies within the large area south of Cuba and west of Ward have a deeper surface covering and more favorable relief than the hilly phase as a whole. These included areas can be placed in cultivation wherever accessible, and their value for the production of crops is very nearly the same as that of typical Cuthbert fine sandy loam.

This is a fairly extensive soil. The larger areas are south and northwest of Cuba, west of Ward, and southeast of Friendship Church.

Probably 90 percent of the land is in forest including principally old-field pine, rosemary pine, post oak, blackjack oak, and dogwood, together with some sweetgum and black gum. Most of the cultivated areas and small fields have not been terraced sufficiently, and erosion has destroyed a large part of them for farming. Erosion is also active in the forested areas. The principal areas in cultivation are used largely for the production of cotton, cowpeas, and some oats. Crop yields are very low. This soil is best used for forestry except on the more gentle slopes where the fields are small. It is droughty for crops, particularly those grown during the summer.

The crops and fertilizers for those areas in cultivation should be the same as for Cuthbert fine sandy loam, except that more attention should be given to close-growing crops. Kudzu is difficult to establish on this soil.

Vaiden fine sandy loam, rolling phase.—Vaiden fine sandy loam, rolling phase, includes areas of Vaiden clay, rolling phase, Oktibbeha fine sandy loam, rolling phase, and Oktibbeha clay, rolling phase. These soils are grouped in one classification because the fine sandy loam, which predominates, and the clay types are so closely associated that a definite separation was impractical. In general, the fine sandy loam occupies the flatter parts of rolling ridge tops, the fan-shaped areas, and areas near the bases of gentle slopes. The clays occur on the breaks and on the steeper slopes where erosion has been too active to allow a sandy covering to accumulate.

This soil occupies rolling to steeply rolling areas, ranging in slope from 7 to 30 percent, east and south of Parker. The broken ridges and divides south and west of Sumterville are gently rolling and range from 5- to 15-percent gradient; whereas the areas northeast and southeast of Geiger are gently sloping to fairly steeply sloping.

Small areas of this rolling land, especially of the fine sandy loam, on the ridge tops, on some of the more gentle slopes, and on fan-shaped areas at the bases of the slopes are in cultivation, but such areas combined do not represent more than 15 percent of the total area. The principal crops are cotton, corn, sweetpotatoes, and peanuts. A small part of the land is used for pasture. The more common grasses are Bermuda grass, Dallis grass, lespedeza, and Johnson grass. Perhaps 75 or 80 percent of this soil is used for forest or for woodland pasture. The tree growth is principally old-field pine, post oak, and sweetgum. A liberal application of phosphate should be helpful to Dallis grass and lespedeza.

Sumter clay, eroded phase.—Sumter clay, eroded phase, is recognized as chalk land and is easily identified by the white landscape. The material is mainly cream-white partly weathered chalk. The soil profile and the surface configuration vary widely.

Included with this soil on the map are small areas of Sumter clay, Vaiden clay, Bell clay, and Sumter-Oktibbeha clay.

This eroded soil is fairly extensive. The larger areas occur along the Tombigbee River in a more or less continuous strip from Epes to Belmont and from the river northwestward toward Emelle. Other areas are along Bodka Creek and east of Livingston.

The roughest, steepest, and most severely eroded or gullied slopes are north and east of the sand-hill area toward the Tombigbee River. They have practically no agricultural value even for grazing or forestry. There are other rough, broken, and nearly bare areas; but most of the land is more gently rolling or gently sloping, and some areas are nearly flat.

The more gently rolling to rolling areas at one time were in cultivation and produced principally cotton, in addition to some corn, grain, and hay. Continuous cropping over a long period induced extreme erosion of the surface soil or loose surface material, which in many places rested on the rather impervious Selma chalk. Practically all of the surface soil and loose material suffered from sheet erosion, and gullies formed on nearly all slopes and around all the heads of natural drainageways. The gullies range from fairly deep V-shaped ones in the areas underlain by the claylike chalk or rotten limestone to shallow generally rather wide ones in the areas underlain by the harder semi-indurated chalk. In many places the gullies reach nearly to the crests of the low rounded ridge tops.

Only a very small proportion of this soil is in cultivation. It is used largely for pasture and hay in connection with the production of beef cattle. Under present conditions this soil produces a small amount of grazing per acre as it is too droughty for all crops except those that grow in early spring. Furthermore, erosion is so rapid that grasses are difficult to establish. Sweetclover is best established on the more eroded areas, and Johnson grass and black medic become established on many of the shallow highly calcareous smooth spots. White Dutch clover, which is not very abundant in most places, grows only in the deeper and better spots. The sedge grasses grow naturally on the more acid brown and reddish-brown clay spots.

Numerous trees and shrubs that are either lime-loving or tolerant to lime have come in since the land has been taken out of cultivation. Cedar comes in very rapidly if the land is not mowed for hay or pastured too closely. In places cedars have become established where only bare parent material remains and is too shallow to maintain a growth of grasses. Redbud, hackberry, and cottonwood are common along the bottom of slopes where moisture conditions are more favorable. Shortleaf and loblolly pines grow on the somewhat brown clay spots. Plum thickets are common, especially where the trees have spread from abandoned orchards around old house sites.

From 75 to 90 percent of the surface is covered or partly covered by grasses, trees, briers, or brambles, which greatly reduce run-off and erosion. Destructive sheet erosion has been checked and the active gully erosion greatly reduced on probably 50 percent of the land that has been abandoned for a period ranging from 5 to 10 years. Measures are still needed, however, to control active gullying.[6]

The land is held or controlled in large bodies by cattlemen. Very few tenants are located on this soil or in the areas where it predom-

[6] Considerable work has been done by personnel of the Civilian Conservation Corps near Gainesville to control erosion on this type of land.

inates, and only enough tenants remain to assist in the care of the cattle, to harvest the hay, and to produce the corn generally grown on the smoother soils and bottom lands that occur in close association with this soil. Small selected areas are farmed, and some cotton is produced, as well as a few other crops. The crops produced are the same and the yields average about the same as those on typical Sumter clay. A liberal application of superphosphate should prove beneficial for the production of pasture grasses.

Sumter-Vaiden complex, hilly phase.—Sumter-Vaiden complex, hilly phase, includes hilly to rolling areas of Sumter clay, Vaiden fine sandy loam, Oktibbeha fine sandy loam, Vaiden clay, and Oktibbeha clay, together with a few small areas of Ruston fine sandy loam on the higher hills.

This complex is developed largely throughout the section between Belmont in the eastern part of the county and Emelle in the western part. In the southeastern part, where the elevations are highest, this classification does not include the soils on the upper part of the ridges and small plateaus, which are developed from the sandy clay mantle and are not influenced by the calcareous material of the Selma chalk. Here, the hilly phase of the Sumter-Vaiden complex occurs principally on the slopes below that mantle and continues down the rough slopes as far as the mixed condition of sandy and calcareous material extends.

From New Prospect Church northwestward to a point about 2 miles west of United States Highway No. 11, this mixed soil occupies rolling to steeply rolling broken ridges and hills. Most of the ridges are capped by gray fine sandy loam (Vaiden fine sandy loam and some Oktibbeha fine sandy loam) or yellowish-brown to reddish-brown clay (Vaiden clay and some Oktibbeha clay). Only on a few of the broader ridges are the sandy spots large enough to separate as distinct soil types or phases on the scale of mapping used. This sandy capping is more than 15 feet thick on a few of the included higher hills, but it thins out abruptly on the slopes that have predominantly a Sumter clay surface soil. The thickness of the covering on most of the ridges and hills ranges from less than 1 foot to about 7 feet.

Westward beyond this central area the elevation is lower and the dissection is not to so great a depth. The sandy covering becomes very much thinner. In places the sandy material has been washed from the ridges and small peaks and deposited on the slopes or at the bases of the slopes. This is true especially in small saddlelike positions between the low knobs of sandy soils on either side.

The crumbled chalk material, or the Sumter soil, forms probably not more than 40 percent of the total area of this mixed soil. The covering of sands and clays on much of it is merely a thin layer, from 6 to 12 inches thick, over partly weathered chalk. Colluvial sands and sandy clays are common along the bases of many slopes.

Approximately 50 percent of this land northwest of New Prospect Church has been cleared and farmed. The loss of almost all of the surface covering by erosion has led to abandonment of the land for cultivation, and at present only patches of 1 or 2 acres on the smoother ridge tops, benches, and lower slopes are farmed. The best use for this mixture of soils is for forest and pasture.

Those areas southeast of New Prospect Church and between that place and Belmont are steeper and more broken than the rest. They support very little tree growth, and their main use is for pasture, especially on the more gentle slopes and narrow bottoms. The use of that part of this phase northwest of New Prospect Church and extending to United States Highway No. 11 is about equally divided between forest and pasture.

The sandy and clay materials on the crests or deposits on the slopes and at the bases of the slopes are generally well covered with shortleaf pines and hardwoods. Most of the calcareous spots are in grass. A few of the smoother ridge tops, benches, and slopes are cultivated. West of United States Highway No. 11 the predominant use is pasture, but some spots support good stands of pines, cedars, and hardwoods.

The principal crops are cotton and corn, and some small areas are used for home gardens, sweetpotatoes, and peanuts. The yields on these selected spots are about the same as those obtained on Vaiden fine sandy loam or Sumter clay.

Over the area as a whole the forest growth is mixed hardwood, pine, and red cedar. Red cedar, shortleaf pine, and loblolly pine are the common evergreens; and hickory, hackberry, various oaks, poplar, sweetgum, and black gum are the more common hardwoods.

This area of soils, together with adjoining or contiguous areas of the rough lands, would form a sufficient acreage for the development of forest resources and for upland game preserves. The present natural reforestation could be assisted in developing the more desirable species of trees. Forest management is discussed in the section on land uses and agricultural methods.

Guin soils, undifferentiated.—Guin soils, undifferentiated, comprise hilly, badly broken, and eroded lands, predominantly in the sand hills northwest and southeast of Belmont and southeast of New Prospect Church. Smaller areas are northwest and west of York and in a few other places. They include areas of Ruston, Orangeburg, Red Bay, Wilcox, and Cuthbert soils so intricately mixed that no soil type or phase could be separated on the scale of mapping used.

Drainage is excessive, and erosion is very active. These soils are not suitable for the production of crops and are of very little value even for pasture. Their best use is for forestry and for game preserves. The tree growth varies from place to place depending largely on the character of the soil materials. Shortleaf and loblolly pines and oaks are the principal trees. Sweetgum, poplar, hickory, and, in places, magnolia, bay, dogwood, holly, chestnut, longleaf pine, and persimmon are scattered over the area.

Some small flatter ridge tops, the smoother benchlike positions, and the more gentle slopes, ranging from less than an acre to about 5 acres in size, which are too small to map separately, are included with this classification. A few such areas are cultivated.

IMPERFECTLY AND POORLY DRAINED SOILS SUITED MAINLY TO FOREST AND RANGE-LAND PASTURE

The soils limited by imperfect or poor drainage and suited mainly to use for forest and range-land pasture comprise 18.3 percent of the area of the county. In their native condition these soils are either insufficiently drained or subject to frequent overflows. They range from heavy clays to fine sandy loams. A few areas have been cleared and utilized for corn, sorghum, and soybeans, and, when economic conditions justify expansion in production, more areas can be drained by ditches and devoted to general crops. Carpet grass does well on these soils after the trees have been removed. In the wooded areas considerable gray moss, canes, and underbrush afford some feed for cattle during the winter.

SOILS OF THE UPLANDS

The first subgroup of soils restricted mainly to forest and rangeland pasture because of imperfect natural drainage include Pheba fine sandy loam and Pheba loam, flat phase, both of which occur on the uplands.

Pheba fine sandy loam.—Pheba fine sandy loam is similar to Pheba loam, flat phase, in drainage and soil development.

In wooded areas it has the following profile characteristics:

0 to 5 inches, gray loamy fine sand containing a large quantity of organic matter in the upper part.

5 to 20 inches, pale-gray or yellowish-gray loamy fine sand containing a few yellow mottlings. This layer in many places extends to a depth of 30 or 32 inches.

20 to 30 inches, grayish-yellow fine sandy loam intensely mottled with yellowish brown and gray.

30 inches +, hard firm compact cemented fine sandy loam or light fine sandy clay, that is easily crushed when removed from place.

The soil is very strongly acid throughout.

Included with this soil are several small areas of Pheba loam, flat phase, and Pheba loam, that are too small to separate on the map.

Less than 1 square mile of Pheba fine sandy loam is mapped, chiefly in the vicinity of Geiger, near other Pheba soils.

In general, this soil occupies rather flat or gently sloping areas, but in some places, especially east of Geiger, it occupies slightly higher ridges with sufficient slope to provide better drainage than is typical. These better drained areas constitute most of the tillable land of this classification. Under present economic conditions this soil is best suited to forestry and pasture. Carpet grass makes excellent growth on the cleared areas and tends to crowd out other pasture grasses. Shortleaf pine and some longleaf pine, together with scattered hardwoods, mainly sweetgum, water oak, and post oak, constitute the principal forest growth.

Pheba loam, flat phase.—Pheba loam, flat phase, designates wet poorly drained areas closely associated with areas of the typical soil. During wet periods in winter, water sometimes covers the surface and stands for days in depressions so shallow that they would otherwise be unnoticed.

This soil has the following profile characteristics:

0 to 6 inches, gray light fine sandy loam, the topmost 2 or 3 inches of which contain enough organic matter to impart a dark-gray color. The material contains a fairly high percentage of silt.

6 to 18 inches, pale-yellow or grayish-yellow friable light fine sandy loam mottled with gray, yellow, and brown. This material also contains considerable silt.

18 to 30 inches, pale-yellow friable very fine sandy clay mottled with bright yellow and some very faint gray. It is somewhat compact in place but friable.

30 inches +, yellowish-gray compact very fine sandy clay mottled with gray and rusty brown. The compactness in this layer is noticeable even under wet conditions.

The percentage of clay is rather low throughout the surface soil and the subsoil.

The reaction is strongly acid to very strongly acid throughout.

In the swales and depressions within areas of Pheba loam, flat phase, and of other sandy soils in the county, are small bodies of Plummer fine sandy loam that are too small to be separated on a small-scale map. Such bodies represent the most poorly drained soil of the uplands. The surface soil of Plummer fine sandy loam is gray loamy fine sand to a depth ranging from 15 to 20 inches. It contains considerable organic matter in the topmost 2 or 3 inches. The subsoil is pale-gray sandy clay mottled with yellow and rusty brown. Some of the largest areas of this soil are southwest of Livingston.

Pheba loam, flat phase, is developed on the flat broad divides, in slight depressions, and on very gentle slopes in the sandy flatwoods areas, in both the southern and northern parts of the county. The largest areas are southwest of Livingston, northeast of York, east of Geiger, and in the vicinity of Bellamy. This soil is poorly drained. The greatest problem in its utilization is the removal of surplus water.

Only a small part of this flat land is under cultivation. The rest is forested to longleaf pine, sweetgum, water oak, black gum, bay, tupelo gum, water oak, shortleaf pine, and, in some places, an undergrowth of gallberry and sedge grasses. Carpet grass and lespedeza do well if the briers and gallberries are kept down and the excess water removed by ditches. The few areas under cultivation are in the better drained part of this soil and are used for the production of crops similar to those grown on Pheba loam. Pasture grasses could be greatly improved by liberal applications of phosphate, either superphosphate or basic slag, and lime. The best use for this soil is for pasture and forestry.

SOILS OF THE TERRACES AND FIRST BOTTOMS

The second subgroup of imperfectly and poorly drained soils suited mainly to forest and range-land pasture includes Augusta silt loam, Kalmia-Myatt fine sandy loams, Leaf clay, Leaf fine sandy loam, flat phase, Ochlockonee silt loam, Chastain very fine sandy loam, Myatt fine sandy loam, alluvial soils, undifferentiated, and swamp, all which are developed on the terraces and first bottoms.

Augusta silt loam.—Augusta silt loam is closely associated with the Wickham and Altavista soils. It occupies the more poorly drained positions of the association. Although the Tombigbee River, along which it occurs, does not flow out of the Piedmont area, the soil material has every evidence of having been brought out of this area either during some geological removal of material or by a shift in the courses of the rivers that flow from the Piedmont area. This soil is subject to overflow during winter.

The soil in uncultivated areas has the following profile characteristics:

0 to 4 inches, brownish-gray or grayish-brown silt loam. Iron concretions are present in most places.

4 to 14 inches, pale-yellow friable silty clay loam containing some yellow and brown mottlings and finely divided mica flakes.

14 to 36 inches, yellowish-gray or pale-yellow slightly compact but brittle silty clay mottled with rust brown, gray, and yellow. Soft iron concretions and fine mica flakes are abundant.

36 inches +, gray compact silty clay, which is so firm that it seldom becomes saturated even though water stands on the surface for long periods.

The reaction ranges from strongly acid to very strongly acid.

Bordering the surrounding Wickham and Altavista soils are good areas of Augusta silt loam, whereas bordering the drainage channels and in the centers of the depressions the soil is light gray throughout and is more poorly drained than the typical soil. This inclusion would be separated as Roanoke silt loam if the scale of mapping allowed.

This is an inextensive soil developed along the Tombigbee River chiefly southwest and northeast of McDowell and northwest of Gainesville.

Very little of the land is in cultivation, owing to the large included acreage of Roanoke silt loam, which requires artificial drainage for the successful production of crops. The land is, therefore, used largely for pasture. Carpet grass, lespedeza, and Dallis grass are the principal pasture grasses. Some is used for forestry. Sweetgum, water oak, bay, and other hardwoods constitute most of the tree growth. The outer edges of the areas are cultivated and are well suited to the production of corn, sorghum, sugarcane, and soybeans, and, if adequate drainage were provided, the central parts of the areas also could produce good yields of these crops. Very little fertilizer is used, as the natural fertility of these areas exceeds that of the associated Wickham and Altavista soils. The use of 100 to 150 pounds of nitrate of soda for corn and 200 to 400 pounds of superphosphate, or the equivalent of basic slag, however, should be profitable for the production of soybeans or for pasture. Phosphate fertilizers are very beneficial for the production of lespedeza and Dallis grass.

Kalmia-Myatt fine sandy loams.—Kalmia-Myatt fine sandy loams are intermediate in drainage between Kalmia fine sandy loam and Myatt fine sandy loam, and they comprise small areas of each soil. They are not nearly so well drained as the former and much better drained than the latter.

Some included areas have the following profile characteristics:

0 to 6 inches, gray fine sandy loam or loamy fine sand, containing some organic matter in the surface part.

6 to 15 inches, grayish-yellow friable fine sandy loam containing some splotches of yellow and gray.

15 to 24 inches, pale-yellow friable fine sandy clay containing many yellow and gray mottlings. Below a depth ranging from 24 to 30 inches this soil becomes grayer, stiff, and somewhat plastic.

The soil is very strongly acid throughout.

Small areas of Leaf fine sandy loam that are too small to separate are also included with this classification. The areas south of the Sucarnoochee River south of Livingston have a more sticky subsoil than the soil as a whole.

This soil has fair to slow surface drainage and slow internal drainage. Probably not more than 15 percent of the land is in cultivation. The areas selected for tillage lie somewhat more favorably in respect to surface drainage than does most of this soil. The rest is used in part for pasture but mainly for forestry and range land. The cultivated areas are best suited to corn, sorghum, sugarcane, and soybeans. The areas in pasture produce carpet grass largely, with some Dallis grass and lespedeza. The tree growth is predominately loblolly pine, rosemary pine, sweetgum, black gum, and water oak, together with some longleaf pine. On the cultivated areas liberal applications of phosphate should be helpful in the production of pasture grasses and hay, whereas mixed fertilizers containing a high percentage of nitrate should be profitable for corn, sorghum, and grasses. A liberal application of lime and phosphate should be very profitable on the tilled and pasture areas.

Leaf clay.—Leaf clay occupies flat low poorly drained areas, which in many places merge into the bottom land without any perceptible slope. This soil has been washed from such heavy upland soils as Vaiden clay, Eutaw clay, Lufkin clay, and Wilcox clay and redeposited by the streams in these low positions. Many of the areas are subject to overflow during the winter.

Leaf clay has the following profile characteristics in wooded areas:

0 to 2 inches, brownish-gray silty clay containing some organic matter.
2 to 6 inches, grayish-yellow heavy plastic clay mottled with brown and gray.
6 to 30 inches, gray sticky plastic clay intensely mottled with yellow, brown, and red.
30 inches +, gray heavy plastic clay mottled with rusty brown and bluish gray.

This soil is very strongly acid throughout.

This soil includes small areas of Augusta silt loam, Leaf fine sandy loam, Leaf loam, Eutaw clay, terrace phase, and Lufkin clay, which are too small to separate on a small-scale map.

Leaf clay occurs in fairly large bodies east and north of Belmont, southwest of McDowell, northwest of Gainesville, and 5 miles southeast of Gainesville. Smaller areas are along the Sucarnoochee River, especially near Boyd. Owing to the flat surface and heavy texture of this soil, both external and internal drainage are poor. Drainage ditches to remove most of the surface water have been provided in some places. The drained areas are frequently in cultivation to sorghum, soybeans, and corn or are used for pasture containing carpet grass, together with some Dallis grass and lespedeza.

Leaf fine sandy loam, flat phase.—Leaf fine sandy loam, flat phase, occurs in low terrace positions in close association with Leaf fine sandy loam and Leaf clay. It is more poorly drained than Leaf fine sandy loam and more sandy than Leaf clay. Small areas of Leaf fine sandy loam, Leaf clay, and Kalmia-Myatt fine sandy loams are included on the map.

In wooded areas it has the following profile characteristics:

0 to 12 inches, light-gray or pale-gray fine sandy loam.
12 inches +, gray plastic clay mottled with yellow, brown, and some red. This layer extends to a depth ranging from 36 to 50 inches without apparent change.

This soil is very strongly acid throughout.

The largest areas are northwest of Bennett, near Woodford, northwest of Belmont. Numerous smaller areas are along the Sucarnoochee River, Cotohaga Creek, and Kinterbish Creek.

A very small proportion—about 5 percent—of this soil is in cultivation as it is too poorly drained for the satisfactory production of crops, except in a few small areas where artificial drainage is provided. Sorghum, sugarcane, soybeans, and some corn are the major crops. Probably 60 percent of the land has been cleared, drained, and used for pasture, largely of carpet grass, with some Dallis grass and lespedeza. A liberal application of phosphate and lime would no doubt be helpful in the open areas, whether they are used for crops or pasture. The rest of the land is in forest, largely of post oak, white oak, sweetgum, black gum, and red oak, together with some old-field pine, shortleaf pine, and a pine locally called swamp pine. The undergrowth consists of young trees of the varieties mentioned and rattan vine, blackberry, and other vines and briers.

Ochlockonee silt loam.—Ochlockonee silt loam occurs in much larger areas than Ochlockonee fine sandy loam and at slightly lower elevations. The 3- or 4-inch surface soil is brown or grayish-brown heavy silt loam, which grades abruptly into light-brown or grayish-brown silty clay loam mottled with reddish brown, gray, and shades of yellow and rusty brown. This material continues to a depth of 3 feet or more. In many places the subsoil, below a depth of 15 inches, is distinctly mottled, heavier textured than the subsoil described, and slightly plastic and sticky. In some of the more poorly drained areas, the subsoil is bluish-gray or mottled blue and gray heavy silty clay at a depth ranging from 2 to 3 feet. Grading toward Ochlockonee fine sandy loam, the surface soil is thicker and in some places is a loam.

This soil is subject to frequent overflow, and in some places along the Tombigbee River, water stands on the surface for a considerable period during freshets. Some of the areas, such as those east of Belmont and northeast of Toms Creek, occupy slightly higher positions and are better drained than the soil as a whole.

Ochlockonee silt loam is the second most extensive soil in the county. Large areas occupy the first bottoms of the Tombigbee River, especially southeast of Whitfield, north and south of Memorial Bridge, northeast of Reeds Ferry, south and west of Merryweathers Ferry, in Swinners Bend, and east of Lake Hollolla. Smaller areas border the Noxubee River, the Sucarnoochee River, Alamuchee Creek, and many of the smaller tributaries of the two streams last mentioned.

About 5 percent of this soil is under cultivation, 50 percent is in forest, and the rest is used for pasture. The predominating trees are hardwoods, chiefly oak, hickory, hackberry, ash, birch, sweetgum, black gum, and ironwood, together with some loblolly pine, shortleaf pine, and swamp pine. In the swales and more poorly drained areas, tupelo gum and water oak are the principal trees. In some of the swampy areas, indicated by symbols on the map, the predominant growth is cypress and tupelo gum.

Ochlockonee silt loam is a fertile soil. It works to a fine mellow condition and is easy to cultivate when well drained. Corn and hay are the principal crops. The pastures support a good stand of carpet grass, Dallis grass, lespedeza, and some clover. Under present conditions, the great danger from overflow waters precludes the use of this soil for general crops.

Chastain very fine sandy loam.—Chastain very fine sandy loam is similar to Leaf fine sandy loam except that it occurs in first bottoms subject to frequent overflows. It has washed out from the surrounding heavy soils and been deposited along the streams.

In wooded areas it has the following profile characteristics:

0 to 4 inches, brownish-gray or gray fine sandy loam containing a dark coloration of organic matter in the topmost part.
4 to 22 inches, mottled gray and yellow rather heavy very fine sandy clay.
22 inches +, gray plastic clay mottled with light gray, yellow, and red. This material is underlain by bluish-gray plastic clay at a depth ranging from 30 to 40 inches.

The principal areas are along Alamuchee Creek south of Cuba. Others are along Yellow Creek southwest of Livingston and along Bodka Creek northwest of Emelle.

This soil is used largely for forestry. Several areas have been cleared and used for pasture. A few areas are used for crops, principally sorghum and soybeans. The forest growth consists largely of sweetgum, water oak, ironwood, and magnolia, with some shortleaf pine. Carpet grass, lespedeza, Dallis grass, and hop clover supply most of the grazing. Phosphate and lime should be very helpful for the growth of pasture grasses and hay crops.

Myatt fine sandy loam.—Myatt fine sandy loam is recognized as being among the poorest drained soils in the county. It occurs on stream terraces and is waterlogged or saturated throughout the winter and early spring.

It has the following profile characteristics:

0 to 6 inches, gray loamy fine sand containing considerable organic matter in the topmost part. Many of the dry areas appear very light gray.
6 to 24 inches, light-gray loamy fine sand or light fine sandy loam containing a few faint brown and yellow splotches.
24 to 36 inches, gray sandy clay mottled with rusty yellow and some brown. This material is slightly sticky but fairly friable.
36 inches +, slightly plastic clay mottled with yellow and rusty brown. This layer and the underlying material check the downward movement of water and do not allow this soil to dry until late in the season.

The reaction is strongly acid to very strongly acid throughout.

Myatt fine sandy loam occurs in fairly large to small areas northwest of Gainesville, west of Panola, south of Livingston, southeast of Ward, near Bellamy, and near Woodford. North of Gainesville it occupies flat wide depressions extending into long drainage areas, in which the drainage courses are very poorly developed. This soil varies somewhat in texture from place to place, but the very fine sand is noticeable in all areas. South and west of Lilita the subsoil is heavier textured than elsewhere and is somewhat plastic.

Less than 3 percent of this soil is in cultivation, principally to corn, sugarcane, and hay. A small percentage is in cleared pastures, largely of carpet grass, Dallis grass, lespedeza, and broomsedge. The rest of the land is forested with sweetgum, black gum, water oak, willow oak, swamp pine, some shortleaf pine, and loblolly pine, on the better drained areas, and swamp pine and bay in the very poorly drained areas.

Alluvial soils, undifferentiated.—Alluvial soils, undifferentiated, is a classification of alluvial-colluvial material deposited in the first bottoms, generally as narrow strips along the smaller streams, having no definite color, texture, or structure. In this county the classification has been limited to those bottom lands containing soil material derived from the sandy uplands. The texture ranges from sand to heavy fine sandy loam, and deposition is so recent that the material occurs in alternating layers of sand, sandy loam, and sandy clay. Because of the rapid flow of the water that deposits this material, the texture of the soil in few places is finer than heavy fine sandy loam. The color is influenced to some extent by the color of the materials washed in, but it ranges from light gray, yellowish gray, or reddish gray to dark gray or dark brownish gray.

This soil is subject to overflow during heavy rains, but all areas are not subject to destructive overflow. Most of the areas are best suited for pasture or forestry, but a fairly large percentage of the more favorably situated land is in cultivation. On the forested areas are many hardwoods, such as water oak, willow oak, cottonwood, sweetgum, and poplar, with willow and bay in the more poorly drained areas. In places rosemary pine and loblolly pine grow in large numbers. The principal grasses are carpet grass, Dallis grass, lespedeza, and broomsedge. The crops grown on the cultivated areas are corn, sugarcane, sorghum, beans, peas, peanuts, and grasses for hay. No fertilizers are used on this soil. In the well-situated areas, yields are generally good. A liberal application of phosphate, or its equivalent in basic slag, should be helpful for the pasture grasses and hay crops.

Swamp.—Swamp designates more or less permanently wet areas on the river bottom lands. The larger ones are separated and shown on the soil map, but many narrow swales, especially along the Tombigbee River, are too small to show on the map, and they are indicated by swamp symbols within the Ochlockonee silt loam areas. Very few of the swamp areas can be improved permanently by drainage. Their best use is for forest including such trees as cypress, tupelo gum, and other water-loving species. In most places organic matter accumulates in the surface soil, and in places it imparts a black color to a depth of 30 or more inches. Many of the swamp areas have only a thin covering of dark-brown or black organic matter over gray or grayish-brown heavy sticky tight clay, which passes into bluish-gray clay and continues to a depth of more than 3½ feet.

PRODUCTIVITY RATINGS

In table 5 estimated yields are reported for the more important crops for each of the soils on which they are grown in Sumter County.

TABLE 5.—*Productivity ratings of soils in Sumter County, Ala.*

Soil [1]	Approximate (estimated) yield [2] for—																					General productivity grade (based on present use in county) [6]	Principal crops or present use
	Cotton		Corn		Winter oats		Soybean or cowpea hay [3]		Peanuts		Sugar-cane sirup		Sorghum silage		Sweet-potatoes [4]		Potatoes [4]		Winter legumes [5]	Peaches [5]	Pasture [5]		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B					
Soils suited to general farm crops	*Lb. of lint*	*Lb. of lint*	*Bu.*	*Bu.*	*Bu*	*Bu*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Gal.*	*Gal*	*Tons*	*Tons*	*Bu*	*Bu.*	*Bu.*	*Bu.*					
Amite fine sandy loam	350	500	20	35	30	50	1	2	40	60	-----	-----	-----	-----	90	125	90	165	1	1	(7)	1	Cotton, oats, hay, corn.
Red Bay fine sandy loam	350	500	20	35	30	50	1	2	40	60	-----	-----	-----	-----	90	125	90	165	1	1	(7)	1	Do.
Orangeburg fine sandy loam	350	500	20	35	25	45	1	2	40	60	-----	-----	-----	-----	90	150	100	200	1	1	(7)	1	Do.
Ruston fine sandy loam	350	500	20	35	25	45	1	2	40	60	-----	-----	-----	-----	90	150	100	200	1	1	(7)	1	Do.
Vaiden fine sandy loam	300	500	20	35	25	45	1	2	40	60	-----	-----	-----	-----	90	150	100	200	1	1	(7)	1	Do.
Cahaba fine sandy loam	300	450	20	35	25	45	1	2	40	60	-----	-----	-----	-----	90	150	100	200	1	1	(7)	1	Do.
Wickham fine sandy loam	250	400	15	30	25	45	¾	1½	30	50	-----	-----	-----	-----	90	150	90	175	1	2	(7)	2	Do.
Cuthbert fine sandy loam	250	400	15	30	25	45	¾	1½	30	50	-----	-----	-----	-----	90	150	90	175	1	2	(7)	2	Do.
Norfolk fine sandy loam	250	400	15	30	25	45	¾	1½	30	50	-----	-----	-----	-----	90	150	90	175	1	2	(7)	2	Do.
Pheba loam	250	400	15	30	25	45	¾	1½	30	50	-----	-----	-----	-----	90	150	90	175	1	2	(7)	2	Do.
Kalmia fine sandy loam	225	275	15	30	25	40	1	1½	30	50	75	150	5	10	75	150	90	175	2	2	(7)	2	Do.
Vaiden fine sandy loam, terrace phase.	225	275	15	30	25	40	1	1½	30	50	75	150	5	10	75	150	90	175	2	3	3	2	Cotton, oats, pasture,corn.

[1] Soils are listed in each group in the approximate order of their general productivity under the prevailing current practices.

[2] It should be realized that the numbers used here for yields are given only as estimated averages. Each number should be interpreted as representing a range in yield. Thus, each number for cotton represents approximately a range of 25 pounds, whereas those for corn and hay represent, respectively, ranges of 5 bushels and ¼ of a ton. Yields in column A are those obtained under the more common practices of management that prevail in Sumter County and include the use of commercial fertilizers; those in column B refer to yields obtained under more intensive or recommended practices that include the greater use of legumes, green manures, manures, commercial fertilizers, and improved plant varieties. Results at State experiment fields have provided a basis for most of the estimated yields.

[3] The yield of cowpea hay generally is lower than that of soybean hay.

[4] Crops grown in small patches, few of which exceed 2 or 3 acres.

[5] These indexes are only comparative to indicate the adaptability of the various soils. Order of preference is 1, 2, 3, 4.

[6] This classification indicates the comparative general productivity of the soils according to their use in the county, the more productive having the smaller number.

[7] Has good possibilities as pasture land but is more economically used for the production of farm crops.

NOTE.—Leaders indicate that the crop is not commonly grown on the particular soil type.

TABLE 5.—*Productivity ratings of soils in Sumter County, Ala.*—Continued

Soil	Approximate (estimated) yield for— Cotton A	Cotton B	Corn A	Corn B	Winter oats A	Winter oats B	Soybean or cowpea hay A	Soybean or cowpea hay B	Peanuts A	Peanuts B	Sugar-cane sirup A	Sugar-cane sirup B	Sorghum silage A	Sorghum silage B	Sweet-potatoes A	Sweet-potatoes B	Potatoes A	Potatoes B	Winter legumes	Peaches	Pasture	General productivity grade (based on present use in county)	Principal crops or present use
Soils suited to general farm crops—Continued	*Lb. of lint*	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Gal.*	*Gal.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Bu.*	*Bu.*					
Ochlockonee fine sandy loam	225	275	25	40	----	----	1	2	30	50	100	200	8	15	75	150	90	175	----	----	3	2	Corn, hay, pasture, sorghum
Altavista loam	150	300	7	20	15	30	½	1	20	40	75	150	5	10	75	125	75	150	2	----	3	4	Cotton, oats, hay, corn.
Leaf fine sandy loam	150	300	7	20	15	30	½	1	20	40	75	150	5	10	75	150	75	150	2	----	3	4	Do.
Soils suited to peanuts, fruits, cotton, oats, winter legumes, and corn.																							
Cahaba loamy fine sand	175	325	10	25	15	30	½	1	25	40	75	150	5	10	75	150	90	175	2	2	----	4	Cotton, corn, peanuts, hay.
Kalmia loamy fine sand	175	325	10	25	15	30	½	1	25	40	75	150	5	10	75	150	90	175	2	2	----	4	Do.
Ruston loamy fine sand	175	325	10	25	15	30	½	1	25	40	75	150	5	10	75	150	90	175	2	2	----	4	Do.
Calcareous soils suited to pasture, corn, oats, and hay.																							
Bell clay	200	400	30	40	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	1	Pasture, corn, hay.
Houston clay	200	400	25	35	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	1	Do.
Catalpa clay, sanded phase	200	400	25	40	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	2	Do.
Catalpa clay, high-bottom phase	----	----	25	40	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	2	Do.
Bell clay, flat phase	----	----	25	40	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	2	Do.
Catalpa clay	200	400	25	40	----	----	1	2	----	----	----	----	8	15	----	----	----	----	----	----	1	2	Do.
Sumter clay	150	----	15	30	25	40	½	1½	----	----	----	----	5	10	----	----	----	----	----	----	2	3	Pasture, hay, oats, corn
Sumter-Oktibbeha clays	150	----	8	20	----	----	½	1½	----	----	----	----	----	----	----	----	----	----	----	----	2	4	Do.
Sumter-Oktibbeha clays, rolling phases	130	----	7	15	----	----	½	1½	----	----	----	----	----	----	----	----	----	----	----	----	3	6	Pasture, forest, oats.
Acid soils suited to forest, pasture, and farm crops																							
Vaiden loam, terrace phase	200	350	15	30	20	35	1	1½	30	45	75	150	5	10	75	150	60	125	2	----	2	3	Cotton, oats, pasture, hay.

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Vaiden loam	175	325	12	25	20	35	1	1½	30	45	75	150	5	10	75	150	60	125	2	----	2	4	Do.
Eutaw loam, terrace phase	175	300	10	25	20	30	½	1½	20	35	100	175	5	10	75	150	60	125	3	----	3	4	Forest, pasture, cotton.
Eutaw clay, terrace phase	175	200	10	25	20	30	½	1½	20	35	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Eutaw clay	175	300	10	25	20	30	½	1½	25	40	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Vaiden silty clay	175	300	10	25	20	30	½	1½	25	40	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Eutaw loam	150	250	10	25	20	30	½	1½	25	40	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Lufkin clay	150	250	10	25	20	30	½	1½	25	40	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Wilcox clay	150	250	10	25	20	30	½	1½	25	40	100	175	5	10	75	150	60	125	3	----	3	4	Do.
Soils suited mainly to forest, kudzu, and cover crops [8]																							
Wilcox fine sandy loam	100	250	10	25	20	30	½	1½	20	35	60	130	4	8	75	150	60	125	3	----	4	5	Forest, range land, pasture.
Ruston fine sandy loam, rolling phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	8	Do.
Vaiden fine sandy loam, rolling phase.	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	8	Forest, pasture.
Sumter-Vaiden complex, hilly phase.	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	9	Pasture, forest.
Wilcox clay, rolling phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	10	Forest, range land, pasture.
Cuthbert fine sandy loam, hilly phase.	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	10	Do.
Guin soils, undifferentiated	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	10	Do.
Ruston loamy fine sand, rolling phase.	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	10	Do.
Sumter clay, eroded phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	10	Pasture, forest.
Imperfectly and poorly drained soils suited mainly to forest and rangeland pasture. [8]																							
Augusta silt loam	----	----	12	25	18	30	½	1½	----	----	100	200	5	15	----	----	----	----	----	----	2	5	Do.
Kalmia-Myatt fine sandy loams	125	250	8	20	18	30	½	1½	25	35	75	150	5	10	----	----	----	----	----	----	3	5	Hay, forest, pasture, corn.
Ochlockonee silt loam	----	----	20	40	----	----	1	2	----	----	100	250	8	20	----	----	----	----	----	----	2	5	Pasture, forest, corn, hay.
Pheba loam, flat phase	----	----	8	20	20	30	¾	1½	25	35	100	175	6	12	----	----	----	----	----	----	3	7	Forest, range land, corn, hay.
Pheba fine sandy loam	----	----	8	20	20	30	¾	1½	25	35	100	175	6	12	----	----	----	----	----	----	3	7	Do.
Leaf fine sandy loam, flat phase	----	----	8	20	----	----	½	1½	20	30	75	150	5	10	----	----	----	----	----	----	3	9	Forest, range land, hay, corn
Leaf clay	----	----	----	----	----	----	½	1	----	----	75	150	5	10	----	----	----	----	----	----	3	9	Forest, range land, pasture.
Chastain very fine sandy loam	----	----	10	20	----	----	1	1½	----	----	100	200	7	15	----	----	----	----	----	----	3	9	Do.
Alluvial soils, undifferentiated	----	----	10	25	----	----	1	1½	----	----	100	200	7	15	----	----	----	----	----	----	3	9	Do.
Myatt fine sandy loam	----	----	8	20	----	----	----	----	----	----	75	150	8	15	----	----	----	----	----	----	3	10	Do.
Swamp	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	10	Forest.

[8] Crop estimates are based on small areas selected for farming. General productivity grade is based on common use of these soils, which is principally woodland pasture.

NOTE.—Leaders indicate the crop is not commonly grown on the particular soil type.

The principal factors determining the productivity of land are climate, soil, slope, drainage, and management. Consideration must be given to all these factors in setting up productivity ratings for soil types and in making an attempt to evaluate their influence. Crop yields over a long period of time offer the best available summation of the combined effect of the factors contributing to productivity. Because yield figures are more direct and simple to read than crop-productivity indexes, they are used in table 5. An estimated crop yield is given for each of the soils on which the more important crops of Sumter County are grown. The figures in column A refer to the yields estimated to be obtained under what are considered the prevailing practices of management, whereas those in column B refer to estimated yields obtained by more intensive and specialized practices, which include the greater use of legumes, green manures, manures, commercial fertilizers, rotations, and improved plant varieties.

Although single yield numbers are given for simplicity, they do not represent precisely the yields indicated. Each number should be interpreted only as an approximate yield with an accompanying range above and below the one cited. For example, yields of cotton are reported at 25-pound intervals and each number represents approximately that range, whereas those for corn cover a range of 5 bushels.

The soils are listed under the group headings used in the report. Within each group they are placed in the order of their general productivity. This is a departure from the form of productivity table commonly used, in which all the soils are arranged in the order of their general productivity for the crops commonly grown.

In this table, the column entitled "General productivity grade" refers only to the relative placement of the soils in this county. No attempt has been made to compare these soils with those in other parts of Alabama or elsewhere. The varied character of the crops and the use made of the soils prevent such an effort at this time.

Because of insufficient data on which to base estimates for yields, very general indexes—1, 2, 3, and 4—are used for winter legumes, peaches, and pasture. Although figs, grapes, pears, and pecans are other products grown in the county, the general indexes for peaches reflect in some degree the suitability of the soils for these other crops.

Since only a very few acres of bright-leaf tobacco are grown in the county, no yields or indexes are given for this crop. It is known, however, that Norfolk fine sandy loam, Kalmia fine sandy loam, and Pheba loam are the soils best suited for this crop.

Productivity-rating tables showing either indexes or crop yields do not in themselves present the relative roles that soil types play in the agriculture of a county; they indicate only the productive capacity of the individual soil types under the systems of management to which the information applies. The total agricultural production of a soil type will depend on its extent and geographic distribution as well as on its productivity as reported in the table.

Productivity indexes and estimated crop yields are meant to refer to the production of each crop or group of crops according to some stated method of management without consideration of the economy of such production. They cannot be interpreted into land values except in a very general way. The value of land depends on distance from market, the relative prices of farm products, and a number of other factors, in addition to the productivity of the soil.

LAND USES AND AGRICULTURAL METHODS

In the section on soils and crops the soils are described and discussed according to their natural adaptability to the crops commonly grown. The accompanying soil map shows the location, extent, and individual classification of each soil area. The purpose of the section on land uses and agricultural methods is to discuss recommended crops, varieties, fertilizers, soil improvement, and tillage of the soil. The soils within each group differ considerably from each other, but they are enough alike that, in general, they may be managed in a similar manner. On the other hand, the soils comprising each group have individual characteristics that may restrict them to the production of the crops commonly grown or make them highly desirable for specialized crops, which cannot be grown on other soils of the group. For instance, in the first group the Red Bay and Amite soils should not be considered the same as the other soils for the production of tobacco. On the other hand, these two soils are better suited than the others for the production of leguminous crops. For general farm crops, the soils in each group are expected to produce comparable yields under similar management and crop recommendations. In contrast the soils placed in different groups have widely different characteristics, crop adaptations, crop yields, fertilizer requirements, and in many places entirely different land use. The information in this section is largely from information obtained by the Alabama Agricultural Experiment Station and some from the experience of the better farmers.

In general, practically all of the soils in this county are deficient in plant nutrients, either organic matter, nitrogen, phosphate, lime, or potash, and most of the soils are deficient in all these plant nutrients. Phosphate and nitrogen are greatly needed on all the soils for most crops. Organic matter is needed on all the soils except those on low overflow bottoms and the black soils of the Black Belt. Lime is needed on all soils except those derived directly from or influenced by the lime of the Black Belt.

Most of the soils are very subject to erosion; therefore, carefully constructed terraces are needed and fewer clean-cultivated crops, such as cotton and corn, should be grown. More sod crops, pasture grasses, kudzu, and other crops that check erosion should be used in the farm program.

In subsequent pages the soil groups are shown and their agricultural significance is discussed.

SOILS SUITED TO GENERAL FARM CROPS

The fine sandy loams of the Red Bay, Orangeburg, Ruston, Vaiden, Cuthbert, Norfolk, Amite, Cahaba, Wickham, Kalmia, Leaf, and Ochlockonee series, the terrace phase of Vaiden fine sandy loam, and the loams of the Pheba and Altavista series compose the group of soils suited to general farm crops (group 1).

These soils are used mainly for general farm crops. Most of them have light-textured sandy surface soils and friable subsoils. Cuthbert fine sandy loam, Wickham fine sandy loam, and, to less extent, Vaiden fine sandy loam, however, have stiffer and more compact subsoils, but they are placed in the group because they are so closely associated agriculturally with the rest of its members. The soils of this group are the most friable, the most easily tilled, the most suitable for diversified farming, the most responsive to management, the least erosive, and the most desirable for general farm crops of the soils in the county. Moisture conditions are excellent for crops, and the yields produced are proportional to the fertilization and management practiced. In other words, moisture normally is not such a limiting factor as in other soils. They warm early in the spring and are among the first on which agricultural operations are begun. The subsoils are sufficiently heavy in texture to retain moisture and fertilizer and yet are sufficiently permeable to allow good movement of both gravitational and capillary water in the surface soil and subsoil.

Practically all of the experimental work done by the Alabama station is conducted on the soils of this group; therefore, a large amount of the information obtained is applicable to these soils. The Alabama station has found that the best varieties of cotton for the soils of Sumter County are D. P. L. 11, D. P. L. 10–11, Cook 1010, Stoneville No. 5, Clevewilt, and Cook 144. The land for cotton should be fertilized with 36 pounds of nitrogen, 48 pounds of phosphoric acid, and 24 pounds of potash to the acre. This may be obtained either as 600 pounds of a 6–8–4 mixture at planting time; or 225 pounds of nitrate of soda or the equivalent, 300 pounds of superphosphate, and 48 pounds of muriate of potash (one-fourth of the nitrate of soda applied at planting time with the phosphate and potash and the remainder as a side dressing after the first chopping); or 600 pounds of a 3–8–5 mixture and a side dressing of 112 pounds of nitrate of soda after the first chopping.

The fertilizer should be placed from 2½ to 3 inches below the seed in the drill. One of the best methods of doing this is to place the fertilizer and list or bed over it. This method is very satisfactory, or the listing or bedding may be done first and then the seed and fertilizer put in at the same time by placing the fertilizer 2½ inches or so below the seed.

Varieties of corn recommended for the county are Mosby, Hastings Prolific, Whatley Prolific, Indian Chief, and Mexican June. Mosby and Whatley Prolific are the most popular. The corn should be grown in rotation with cotton and side-dressed with 225 pounds of nitrate of soda, or the equivalent, when the corn is about knee high; or it should follow a winter cover crop that has received a liberal application of phosphate or basic slag.

As a winter cover crop either hairy vetch or Austrian Winter peas should be very satisfactory for soil improvement. They should be planted as early in the fall as weather conditions will allow, preferably in September or October. Inoculation of seed is necessary unless these crops have been grown on the land within the 2 preceding years. The seed may be broadcast or drilled, depending on the equipment owned by the farmer. Superphosphate should be applied at a rate ranging from 300 to 400 pounds an acre, or the equivalent of basic slag, at the time of planting unless the land has received annually the equivalent of this amount of phosphate for several years. Basic slag may be mixed with the inoculated seed at the time of planting without detriment to the inoculant, but superphosphate may injure the inoculant if it is mixed with the inoculated seed.

For soybeans and cowpeas, from 300 to 600 pounds of basic slag or 200 to 400 pounds of superphosphate should be used. The Ootootan and Laredo varieties of soybeans and the Clay variety of cowpeas are recommended for hay.

Oats should be grown in rotation with cotton that has been heavily fertilized and should be top-dressed with 150 to 225 pounds of nitrate of soda or the equivalent in the spring. Red Rustproof (Texas Red) and Fulghum varieties are recommended.

If peanuts are grown where no fertilizer has been used for the previous crops, 400 pounds of basic slag should be applied; and, if fertilizer is used, it should be applied at or before the time of planting. Following a cotton crop that has been heavily fertilized it is not necessary to use fertilizer for the peanut crop.

The adaptation of alfalfa to the Red Bay and Amite soils of this group has not been proved experimentally, but alfalfa has been grown successfully on similar soils by farmers. A liberal application of superphosphate and lime or basic slag, together with the incorporation of a large quantity of organic matter, is necessary for the growth of this crop. It is advisable that the county agent or experiment station agronomist be consulted relative to this crop and to the fertilization necessary for its successful growth.

In the vicinity of Cuba, some of the soils are used for the production of truck crops, principally beans. The common practice is to use an application of 1,000 to 2,000 pounds of a 4-8-4 fertilizer, or a home-mixed fertilizer consisting of 800 pounds of cottonseed meal, 400 pounds of superphosphate, and 100 pounds of muriate of potash applied before the time of planting. Cotton or corn are planted in the middles between the bean rows. When the bean crop is removed, the interplanted crop, either cotton or corn, is tilled. In many places beans are grown in close rows and corn is planted following the harvesting of the beans. No additional fertilizer is used for the corn, but cotton generally is side-dressed with an application of about 100 pounds of nitrate of soda.

SOILS SUITED TO PEANUTS, FRUITS, COTTON, OATS, WINTER LEGUMES, AND CORN

This group of soils suited to peanuts, fruits, cotton, oats, winter legumes and corn (group 2) includes the loamy fine sands of the Ruston, Cahaba, and Kalmia series, which are extremely sandy and very subject to leaching of the soluble plant nutrients. They retain an insufficient supply of moisture for the production of large yields of summer-growing crops. These soils are best suited to the production of spring-growing crops, and peanuts, grapes, peaches, cotton, winter legumes, oats, and velvetbeans. Cotton and corn may be grown economically if liberal quantities of manure or commercial fertilizers have been applied or in fields where winter cover crops have been turned under.

As no experimental work has been done on these soils, recommendations are based on field observations and interviews with farmers.

The crop varieties recommended for the soils of this group are the same as for those of the preceding group. The same types of fertilization also are recommended. Yields, however, are much less and fertilizers make lower economic returns than on those soils, owing to the fact that moisture and plant nutrients are readily lost by leaching as the result of the sandy, porous, and rather droughty character of the surface soils and subsoils. The greatest economic returns from fertilization are expected on the crops that make their growth during spring when moisture is most abundant.

CALCAREOUS SOILS SUITED TO PASTURE, CORN, OATS, AND HAY

The calcareous soils suited to pasture, corn, oats, and hay (group 3) are Houston clay; Sumter clay; Sumter-Oktibbeha clays; Sumter-Oktibbeha clays, rolling phases; Bell clay; Bell clay, flat phase; Catalpa clay; Catalpa clay, sanded phase; and Catalpa clay, high-bottom phase. They constitute the truly Black Belt soils, are neutral to alkaline in reaction, and have special crop adaptations. The Black Belt Substation at Marion Junction includes some of the members of this group, and conclusive results have been obtained for some of them. In view of the different moisture conditions of the soils, they are divided into two subgroups according to crop and fertilizer recommendations. Houston clay; Bell clay; Bell clay, flat phase; Catalpa clay; Catalpa clay, high-bottom phase; and Catalpa clay, sanded phase, constitute the first subgroup, and Sumter clay; Sumter-Oktibbeha clays; and Sumter-Oktibbeha clays, rolling phases, constitute the second subgroup.

The soils of each subgroup differ among themselves but have similar crop adaptations, fertilizer requirements, and land use. At the experiment station it has been determined that Houston clay and Bell clay are adapted to the production of Dallis grass, white clover, sorghum, sagrain (a hybrid of a kafir and a sorghum), soybeans, cowpeas, corn, and possibly peanuts. For best results the land for all these crops, except corn, should be fertilized with 375 pounds of superphosphate an acre. In addition to the phosphate, the land for Dallis grass should be fertilized with 225 pounds of nitrate of soda an acre and that for sorghum and sagrain should each be fertilized with 50 pounds of muriate of potash an acre. Corn did not respond sufficiently to fertilizers on Houston and Bell soils to warrant their application.

These results are based on a 5- or 6-year period. It has been observed that, in addition to the crops mentioned, Johnson grass, partridge-peas, and sensitiveplants do well on this soil. Lespedeza grows in a few locations but tends to develop chlorosis. Oats produce large yields where not waterlogged during the winter. Catalpa clay also is suited to the production of these crops, although in many places it is subject to hazardous overflows. In such areas it should not be used for the production of the grain crops.

According to results obtained at the Black Belt Substation, Sumter clay is best suited to the production of oats, Dallis grass, black medic, alfalfa, corn, sorghum, soybeans, sagrain, cowpeas, and possibly Kentucky bluegrass. These crops do not make satisfactory growth unless the land is liberally fertilized. Land for alfalfa should be fertilized with 375 pounds of superphosphate and 50 pounds of muriate of potash, or its equivalent, an acre annually. The fertilizers should be applied in the fall. Land for each of the other crops should be fertilized with 375 pounds of superphosphate and 50 pounds of muriate of potash, except that for oats and Dallis grass, which should be fertilized with 375 pounds of superphosphate and 225 pounds of nitrate of soda. No lime is needed on this soil. This soil is not considered suitable for the production of cotton, but, if cotton is grown, 375 pounds of superphosphate and 50 pounds of muriate of potash are recommended. If vetch is grown, the land should be fertilized with 375 pounds of superphosphate and 50 pounds of muriate of potash.

Livestock raising, mainly for beef, is carried on principally in the calcareous prairie and mixed prairie sections. Some of the herds are well cared for through the winter by feeding hay, usually Johnson grass hay, with or without a supplement of cottonseed meal, crushed corn, or silage. The animals generally are marketed in July, August, and September. About 60 percent go to the market as fall calves; the others as 2-and-3-year-olds. The cattle are sold on local yards at Epes, Demopolis, and Eutaw, and shipped to Atlanta, Birmingham, and Montgomery. A few go to markets farther north. The herds generally consist of grade or common cows headed by purebred Hereford bulls. Some owners of herds use purebred bulls of other breeds, especially the Shorthorn and Aberdeen Angus. There are, also, a few herds of high-grade and purebred cows. The tendency is toward bettering the herds by keeping higher grade cows for breeding purposes.

ACID SOILS SUITED TO FOREST, PASTURE, AND FARM CROPS

Included in the group of acid soils suited to forest, pasture, and farm crops (group 4) are Vaiden loam; Vaiden silty clay; Eutaw clay; Eutaw loam; Wilcox clay; Lufkin clay; Vaiden loam, terrace phase; Eutaw clay, terrace phase,; and Eutaw loam, terrace phase.

Even though these soils differ widely in many respects, they have many characteristics in common. They are very acid in reaction, very heavy, very sticky, and are very difficult to till. They need, therefore, a heavy application of lime for most economical yields. As experimental data has been obtained on Vaiden clay at the Black Belt Substation, and as crop and fertilizer recommendations are probably the same for all the soils of this group, the results obtained on this soil will be quoted as recommendations for the entire group.

Vaiden clay is best suited to the production of oats, peanuts, sorghum, sagrain, orchard grass, lespedeza, Dallis grass, cowpeas, soybeans, Austrian Winter peas, hairy vetch, velvetbeans, and possibly corn.

Land for cotton should be fertilized with from 400 to 600 pounds of a 6–10–4 fertilizer and 2 tons of lime an acre. That for other crops should receive 375 pounds of superphosphate. In addition to phosphate, land for cowpeas, hairy vetch, soybeans, Austrian Winter peas, lespedeza, and peanuts should receive 2 tons of lime. Land for sorghum should receive, in addition to the phosphate, 50 pounds of muriate of potash, 225 pounds of sodium nitrate, and 2 tons of lime. The requirements for Dallis grass apparently are the same as for sorghum, except the potash is not required. If corn is grown on this soil, 375 pounds of superphosphate, 225 pounds of nitrate of soda, or the equivalent, and 2 tons of lime should be used. Velvetbeans and orchard grass make maximum economical growth when superphosphate alone is used. An application of 2 tons of lime an acre usually is sufficient to supply the lime requirements of that area for many years.

More detailed information may be obtained on these soils by writing to the Black Belt Substation at Marion Junction or the State Agricultural Experiment Station at Auburn.

SOILS SUITED MAINLY TO FOREST, KUDZU, AND COVER CROPS

The group of soils suited mainly to forest, kudzu, and cover crops (group 5) includes Wilcox fine sandy loam, the rolling phases of Wilcox clay, Ruston fine sandy loam, Ruston loamy fine sand, Vaiden fine sandy loam, the hilly phases of Cuthbert fine sandy loam and Sumter-Vaiden complex, the eroded phase of Sumter clay, and Guin soils, undifferentiated.

Although the natural fertility of these soils is fair to good, their rolling relief and their susceptibility to erosion preclude their use for cropland unless extreme care is used in their management to check erosion. These soils are best suited to kudzu or some other crop that will prevent erosion. Clean-cultivated crops may be grown in small fields on the more gently sloping areas, provided adequate terracing and strip cropping is practiced. The more sloping areas should be used for forestry. The extreme range in slope is from 6- to 40-percent gradient, and the common range is from 8 to 20 percent.

Crops and fertilizers discussed for the first group should be applicable to the small cultivated areas of soils included with this group. Yields, however, generally are not so good as those obtained on the soils of the first group, owing to erosion.

For the highest economic returns from forested areas, according to the State extension forester, forest fires should be eliminated. The more merchantable timber, such as old-field pine, longleaf pine, slash pine, white oak, red oak, hickory, poplar, and ash, should be protected in their respective habitats, and a large part of the timber should be allowed to reach maturity. These soils also make fair to good game preserves, as they support enough underbrush and canes along the streams for some deer in the larger areas and enough nuts, beggarweed seeds, native vetch, native lespedeza, American beautyberry (French mulberry), dogwood, and other seeds to supply food for quails and wild turkeys. Game preserves may well be established where there are large associated areas of these soils. Deer, wild turkeys, quails, and squirrels thrive and multiply when protected.

IMPERFECTLY AND POORLY DRAINED SOILS SUITED MAINLY TO FOREST AND RANGE-LAND PASTURE

The group of imperfectly and poorly drained soils suited mainly to forest and range-land pasture (group 6) includes Pheba fine sandy loam; Pheba loam, flat phase; Augusta silt loam; Kalmia-Myatt fine sandy loams; Leaf clay; Leaf fine sandy loam, flat phase; Ochlockonee silt loam; Chastain very fine sandy loam; Myatt fine sandy loam; alluvial soils, undifferentiated; and swamp.

In their native condition the soils of this group are either insufficiently drained or are subject to frequent overflows, thereby handicapping them for farm use. In general, they are best suited for forestry and pasture, although some areas may be cleared, drained, and utilized for the production of corn, sorghum, soybeans, and, in a few places, cotton.

The soils of this group have good possibilities for pasture, provided the areas are drained, the trees are removed, and the underbrush, such as blackberry briers and sweetgum bushes, is kept down. Carpet grass is naturally adapted to the soils, and Dallis grass and lespedeza may be grown satisfactorily, provided from 200 to 400 pounds of superphosphate are applied annually. The better drained areas may be used for the production of corn. The use of 100 to 150 pounds of nitrate of soda for corn and sorghum would probably be economical.

MORPHOLOGY AND GENESIS OF SOILS

Sumter County lies within the region of Red and Yellow Podzolic soils and within the Gulf Coastal Plains physiographic region. The county is crossed in a general northwest-southeast direction by five geological formations. From north to south, these formations are Selma chalk and Selma chalk more or less modified, Sucarnoochee clay, Naheola, Tuscahoma sand, and Hatchetigbee. They are shown in figure 3.[7]

The Selma chalk formation consists of soft limestone and highly calcareous clays. It contains from 50 to 75 percent of lime carbonates, generally mixed with various quantities of fine sand, very fine sand, silt, and clay.

According to the report on geology of Alabama,[7] the sandy facies in the upper part of the chalk formation are developed chiefly in Sumter County. Below this layer is a layer of highly calcareous clays, locally known as rotten limestone. This limestone is exposed mainly on the slopes and small benches bordering the so-called sand hills. Selma chalk, a somewhat hardened limestone, is exposed at the surface or occurs near the surface in large areas near Epes, south of Factory Creek, east and north of Sumterville, west of Gainesville, and in many other places throughout that part of the county. The rotten limestone extends to considerable depth, and underlying it is a harder and more indurated limestone, which when dry is nearly white. This layer is about 900 feet thick near Livingston. It is this part of the formation that is generally thought of as Selma chalk.

The soils that have been derived from the Selma chalk formation through the soil-forming processes belong with the Rendzina group of soils and are included in the Houston and Sumter series. Other series in the Rendzina group are the Bell and Catalpa soils developed on gentle slopes and in bottoms, from local alluvium originating from the chalk formation.

Capping the Selma chalk is a mantle of unconsolidated sands and sandy clays. From these sandy materials deposited over the chalk area are developed the soils that are light-textured fine sandy loams in the A horizon and have a fine sandy clay B horizon. These soils are classed as Red Bay, Orangeburg, Ruston, and Norfolk on the uplands and as Amite, Cahaba, and Kalmia on the terraces.

The Sucarnooche clay formation borders Selma chalk on the southwest. It consists of layers of heavy, tough, or partly indurated and laminated clay, which is dark gray or almost black when moist. It dries to a light shade of gray and breaks into somewhat rounded lumps with conchoidal fracture. The part that is partly exposed covers about one-fourth of the county, and this area is locally known

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[7] Names and location of geologic formations are taken from the following publication: ADAMS, GEORGE I., BUTTS, CHARLES, STEPHENSON, L. W., and COOKE, WYTHE. GEOLOGY OF ALABAMA Ala. Geol. Survey Spec. Rpt 14, 312 pp., illus. 1926.

as the true flatwoods, whereas the adjoining flat sandy areas are commonly spoken of as the sandy flatwoods. Typical Lufkin clay develops from the Sucarnoochee clay formation in the true flatwoods. On the northern border, where this formation thins out near the

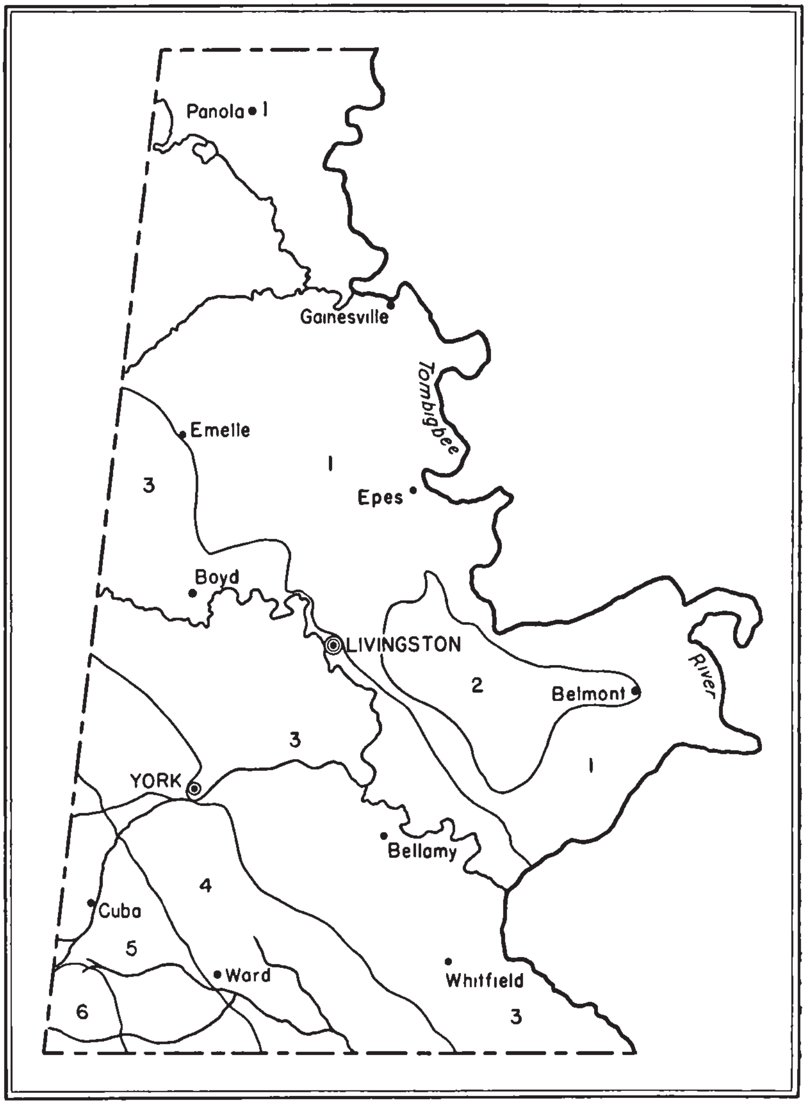

FIGURE 3.—Sketch map showing the geological formations in Sumter County, Ala.: 1, Selma chalk—chalky limestone with variable proportions of clay and sand. 2, Selma chalk more or less modified. 3, Sucarnoochee (Porters Creek) clay—dark-gray plastic clay that is calcareous in the lower part. 4, Naheola—reddish micaceous sand and light-colored sand and clays. 5, Tuscahoma sand—gray laminated sand. 6, Hatchetigbee—gray clay and laminated gray sand. NOTE—Alluvial materials on first bottoms and terraces have not been separated.

Selma chalk formation, some of the soils developed from the Sucarnoochee formation are included with the Eutaw soils; on the southern border, where the slopes rise above the flat areas, the soils have been classed as Wilcox. These soils are dominantly clays or silty clays.

The Naheola, Tuscahoma sand, and Hatchetigbee formations, which cover less than one-fourth of the county, comprise sandy clays or thin laminated fine sand, very fine sand, silt, and clay. These formations occupy positions higher than the true flatwoods and are comparable to the sandy materials that give rise to the Red Bay and related soils. The soils formed from the weathered products of these formations have rather shallow surface soils and stiff somewhat compact heavy clay subsoils. Wilcox fine sandy loam is apparently the most extensive soil developed from the Naheola formation, and Cuthbert fine sandy loam is developed from the other two formations.

The climate is warm, temperate, and humid. The mean annual rainfall is 57.39 inches, and the mean annual temperature is 64.8° F. As the soil rarely freezes, or at least to a depth of not more than 2 to 4 inches for only short periods, leaching is almost continuous throughout the year.

Geologic erosion is responsible for the various divisions of relief. Much additional erosion and gullying have taken place, owing to misuse of the land in general farming operations. Sheet erosion is particularly noticeable in areas underlain by the Selma chalk formation, and deep V-shaped gullies and gulches have formed in some other parts.

Podzolization and laterization are the soil-forming processes that affect the Red and Yellow Podzolic soils of this region, whereas calcification is the soil-forming process that influences the development of the calcareous Rendzina soils of the Black Belt.

In general, climate and vegetation are important factors in soil genesis, but the specific differences in the soils of a small area, such as a county, are due, in large measure, to the parent material and relief. The calcium carbonate of the Selma chalk formation, the heavy clay of the Sucarnoochee clay formation, and the high percentage of fine sand, very fine sand, and silt of the other formations have greatly affected soil development. Age and relief are important in relation to the various soils, and these relationships will be discussed with each important soil type.

The soils formed directly from the Selma chalk formation, such as the Sumter and Houston, were developed largely under a grass vegetation. The other soils have developed under a forest vegetation, including both conifers and hardwoods. The soils of the oak prairie and flatwoods were developed under deciduous forests, in which post oak predominated and other hardwoods and some pine were present.

The reaction of all the soils, with the exception of the Sumter, Houston, Bell, and Catalpa, ranges from slightly acid to strongly acid.

Table 6 give the pH values of the soil material from different horizons of several of the principal soils in various parts of the county.

TABLE 6.—*pH determinations*[1] *on several soil profiles from Sumter County, Ala.*

Soil type and sample No.	Depth	pH
Ruston fine sandy loam:	*Inches*	
417408	5-10	5.2
417409	10-13	4.8
417410	13-21	4.8
417411	21-25	4.8
417412	25-36	4.8
417413	36-48	4.5
417414	48-66	4.6
Cuthbert fine sandy loam		
417415	0- 2	5.0
417416	2- 7	4.9
417417	7-10	5.2
417418	10-16	5.0
417419	16-50	4.6
417420	50+	4.6
Pheba loam:		
417421	0- 5	4.7
417422	5-13	4.8
417423	13-17	4.9
417424	17-30	4.9
417425	30-50	4.9
417426	50-75	4.9
417427	75-83+	4.9
Houston clay		
417451	0- 4	7.8
417452	4-10	7.9
417453	10-25	8.0
417454	25-36	8.2
417455	36-50	8.2
417456	50-60+	8.2
Sumter clay:		
417457	0- 7	8.1
417458	7-16	8.2
417459	16-20	8.3
417460	20 +	8.0
Red Bay fine sandy loam:		
417401	0- 9	6.4
417402	9-13	6.1
417403	13-40	5.4
417404	40-53	5.0
417405	53-78	5.0
417406	78-96	4.8
Wilcox clay:	*Inches*	
417479	0- 1	4.9
417480	1- 4	4.3
417481	4-12	4.4
417482	12-30	4.2
Vaiden silty clay:		
417490	0- 2	5.7
417491	2- 6	4.9
417492	6-12	4.8
417493	12-22	4.9
417494	22-30	4.9
417495	30-42	4.9
Wickham fine sandy loam:		
417433	0- 5	5.2
417434	5-10	5.3
417435	10-24	5.0
417436	24-34	4.5
417437	34-46	4.5
Altavista loam:		
417438	0- 4	5.9
417439	4- 6	4.6
417440	6-11	4.4
417441	11-18	4.4
417442	18-28	4.3
417443	28-60+	4.3
Eutaw clay:		
417466	0- 5	6.5
417467	5- 7	4.7
417468	7-15	4.9
417469	15-30	5.0
417470	30-44	5.1
417471	44-57	5.5
417472	57-58	8.1
Lufkin clay:		
417473	0- 1	5.1
417474	1-12	4.4
417475	12-22	4.6
417476	22-58	4.4
417477	58-63	4.1
417478	63-96	4.1

[1] Determinations made by E. H. Bailey by the hydrogen electrode method in the laboratories of the Bureau of Plant Industry.

The soils of this county can be classified in zonal, intrazonal, and azonal groups. The following are zonal or the normally developed soils and belong to the Red and Yellow Podzolic soils group: The fine sandy loams of the Red Bay, Orangeburg, Ruston, and Norfolk series of the uplands and the fine sandy loams of the Amite, Cahaba, and Kalmia series of the terraces. The intrazonal group includes the calcareous soils derived from the Selma chalk, the heavy clay soils derived from the Sucarnoochee formation, the loamy sands, the poorly drained soils, and the gray post oak prairies. These intrazonal soils reflect the dominating influence of some local factor of relief, parent material, or age over the normal effect of the climate and vegetation. The azonal group includes the alluvial soils and the very shallow soils of the upland.

The mechanical analyses of several of the more important soils in the county are given in table 7.

TABLE 7.—*Mechanical analyses of several soil profiles from Sumter County, Ala.*

Soil type and sample No.	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
Ruston fine sandy loam:	*Inches*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
417407	0–5	0.1	0.7	3.1	30.4	29.3	31.4	5.1
417408	5–10	.0	7	3.4	26.5	22.6	38.4	8.4
417409	10–13	.0	.7	2.9	23.2	20.9	33.7	18.6
417410	13–21	.1	.7	3.0	24.8	20.7	28.9	21.7
417411	21–25	.1	.9	3.4	30.5	24.8	26.9	13.4
417412	25–36	.1	6	3.4	30.2	25.9	24.2	15.6
417413	36–48	.0	4	2.4	27.9	27.4	23.6	18.2
417414	48–66	.0	.2	1.6	27.1	27.5	13.6	30.5
Cuthbert fine sandy loam:								
417415	0–2	.4	5	1.3	44.7	20.7	25.4	7.0
417416	2–7	.4	3	1.3	44.5	17.9	26.2	9.5
417417	7–10	.3	4	1.1	39.7	14.4	21.9	22.3
417418	10–16	4	.3	6	26.9	6.6	10.9	54.2
417419	16–50	1	.2	.8	33.2	6.6	10.1	49.0
417420	50+	.5	1.0	.9	5.6	13.1	20.8	58.0
Pheba loam:								
417421	0–5	.1	1.2	3.8	23.8	19.1	41.7	10.4
417422	5–13	.2	1.3	4.0	25.0	16.8	42.6	10.1
417423	13–17	.1	1.4	4.4	23.7	17.6	40.1	12.7
417424	17–30	.1	1.2	3.8	22.3	15.9	35.8	20.8
417425	30–50	1	1.3	4.9	29.6	20.8	27.8	15.4
417426	50–75	.1	1.4	5.9	33.1	21.1	23.4	15.0
417427	75–83+	.1	1.6	7.4	37.5	19.6	12.0	21.9
Houston clay:								
417451	0–4	1.0	1.7	1.8	3.5	2.5	36.1	53.4
417452	4–10	.6	1.1	1.3	2.8	1.8	33.9	58.4
417453	10–25	1.4	1.5	1.4	2.7	1.8	29.7	61.4
417454	25–36	2.7	3.0	1.7	2.8	2.0	27.2	60.5
417455	36–50	2.2	2.3	1.3	2.8	2.1	26.9	62.4
417456	50–60+	2.7	2.6	1.4	2.6	1.9	26.1	62.6
Eutaw clay:								
417466	0–5	1.9	6.4	6.1	15.1	6.7	32.4	31.4
417467	5–7	.9	2.8	3.2	9.1	4.7	26.8	52.4
417468	7–15	7	2.3	2.7	6.8	3.0	23.2	60.6
417469	15–30	8	2.9	3.1	8.6	4.7	28.6	51.2
417470	30–44	6	2.8	3.0	8.1	4.4	30.3	50.9
417471	44–57	6	2.2	2.9	7.5	4.6	26.9	55.3
417472	57–58	3.3	4.5	2.6	6.8	6.6	26.4	49.7
Lufkin clay								
417473	0–1	4.1	4.1	1.9	2.0	1.5	53.7	32.7
417474	1–12	2.0	2.2	1.1	1.4	1.2	46.9	45.3
417475	12–22	1.5	2.4	1.1	1.1	1.1	43.2	49.6
417476	22–58	1.0	2.0	1.1	1.3	1.1	41.9	50.9
417477	58–63	1.4	2.3	1.5	2.4	2.0	28.9	61.5
417478	63–96	0	3	3	.6	3	17.6	80.8
Vaiden silty clay:								
417490	0–2	.6	1.3	.8	1.7	4.4	55.9	35.2
417491	2–6	.4	1.3	.8	1.4	4.1	52.6	39.3
417492	6–12	2	.8	.5	1.0	3.2	53.6	40.5
417493	12–22	.1	.4	.4	.7	2.0	37.8	58.7
417494	22–30	2	.9	6	.8	2.1	33.0	62.3
417495	30–42	.2	.5	.7	.8	2.0	28.8	66.9
Wickham fine sandy loam								
417433	0–5	2	3.6	12.1	40.2	19.5	16.6	7.8
417434	5–10	.2	2.9	9.0	31.5	18.0	23.4	14.9
417435	10–24	1	1.2	3.2	17.4	13.5	21.5	43.2
417436	24–34	0	.4	1.9	30.7	20.1	15.8	31.1
417437	34–46	0	.8	4.6	38.5	20.1	12.5	23.6
Altavista loam:								
417438	0–4	2.5	7.9	5.2	15.8	15.2	32.8	20.5
417439	4–6	3.2	10.1	4.5	9.6	11.0	34.4	27.2
417440	6–11	1.2	6.0	3.5	8.1	9.7	36.9	34.6
417441	11–18	.5	1.9	1.8	6.3	8.4	35.5	45.7
417442	18–28	.0	.4	.8	3.8	6.4	36.2	52.3
417443	28–60+	0	2	.3	5.9	13.1	37.0	43.5
Vaiden loam:								
417461	0–5	5.6	20.1	15.5	14.2	15.1	18.3	11.2
417462	5–14	2.7	11.6	9.4	7.0	6.3	21.1	42.0
417463	14–24	5.4	15.6	10.0	7.1	6.0	15.6	40.4
417464	24–35	3.3	15.0	11.0	7.0	5.8	13.1	44.7
417465	35–66	3.2	16.2	12.5	7.8	6.2	13.6	40.6
Wilcox clay:								
417479	0–1	.7	1.8	1.3	2.0	3.6	54.1	36.3
417480	1–4	.5	1.0	.7	1.3	2.6	43.0	50.8
417481	4–12	.0	4	3	.5	.8	21.1	76.9
417482	12–20	.2	.6	.3	.5	.9	22.5	75.0
417483	30–40	2	.8	.5	.9	1.4	26.2	70.0
417484	40–50	.0	2	.2	.4	.8	25.4	73.0
417485	50–54	.3	1.0	.6	8	1.2	32.9	63.2

Orangeburg fine sandy loam may be considered representative of the well-drained well-aerated normally developed soils of the general region, derived from unconsolidated sands and clays. A description of the profile of this soil is given on page 19. The chemical analyses of this soil from Lauderdale County, Miss., given in table 8, applies fairly well to Orangeburg fine sandy loam in Sumter County, Ala.

TABLE 8.—*Chemical composition of Orangeburg fine sandy loam, Lauderdale County, Miss.*[1]

Horizon	Depth	SiO_2	TiO_2	Fe_2O_3	Al_2O_3	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	SO_3	Ignition loss	Total	N
	In.	*Pct*	*Pct*	*Pct.*	*Pct.*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct.*	*Pct.*	*Pct*	*Pct*	*Pct*
A	0-10	[2]89 66	0 50	0.93	2 57	0 64	0 16	0 06	0 45	0 15	0 03	0 09	1 53	100 77	0 030
		[3]95 11	.50	.94	2 60	.64	.16	06	.45	15	.03	.09	-----	100.73	-----
B	10-36	[2]87 61	.52	2 41	6 30	.266	.26	.14	.37	35	08	03	2.48	100 82	.030
		[3]89 84	.53	2 47	6 45	.272	.27	.14	38	.35	.08	.03	-----	100 81	-----
		[4]40 35	.44	10 08	33 27	.595	.45	.67	.81	.29	.17	.09	13.60	100 91	.250
		[5]46 70	.51	11 66	38.50	.680	.52	.72	.94	.33	.20	.10	-----	100 80	-----

[1] Collected by H H Bennett; analyzed by W O Robinson and R S Holmes Based on table from SOILS OF THE UNITED STATES, U S Dept. Agr Atlas of American Agriculture, pt 3, p. 51

[2] Whole soil, oven-dried at 110° C.

[3] Whole soil, calculated to mineral constituents only.

[4] Colloid, oven-dried at 110° C

[5] Colloid, calculated to mineral constituents only.

The Ruston soils differ essentially from the Orangeburg soils in that the yellowish-red or reddish-yellow B horizon is lighter colored. The Red Bay soils are brown in the A horizon and red in the B horizon, whereas the Norfolk soils are light gray in the A horizon and have yellow friable sandy clay B horizons.

Most of the sandy clay deposits in this county contain too high proportions of very fine sand, silt, and colloidal clay to produce the friable B_2 horizon common to the soils of the Ruston, Orangeburg, and Norfolk series. Probably Cuthbert fine sandy loam has the characteristic profile one might expect in this general region from sandy clay material that consists of high proportions of fine sand, very fine sand, silt, and clay, but the character of the material has prevented the development of the normal regional profits. Wilcox fine sandy loam is developed from similar material, but has a still higher content of clay. In the Orangeburg and Ruston soils the B horizon is friable fine sandy clay, and in the Cuthbert soil it is stiff compact tough clay.

A description of the profile of Cuthbert fine sandy loam, as observed in a virgin area 1¼ miles southeast of Reeds Chapel, is as follows:

0 to 2 inches, yellowish-gray light fine sandy loam or loamy fine sand, containing a high proportion of very fine sand and silt and a small proportion of organic matter, which gives the layer a slightly dark color.

2 to 7 inches, yellowish-gray fine sandy loam containing a high proportion of very fine sand and silt.

7 to 10 inches, reddish-yellow friable fine sandy loam mottled with shades of light yellow and red.

10 to 16 inches, yellowish-red or reddish-yellow heavy tough compact clay containing considerable fine sand, very fine sand, and silt. The clay has a high content of colloidal clay. Some finely divided mica flakes are present. When moist the color appears uniform, but when dry it is mottled with shades of red and yellow.

16 to 50 inches, mottled and streaked red, yellow, and shades of red and yellow tough compact clay, which breaks up into irregular blocks or lumps along natural cleavage lines coated with brown colloidal clay.

50 inches +, grayish-white smooth laminated clay faintly specked with red and yellow. The laminations are separated by thin layers or streaks of friable grayish-yellow or brownish-yellow clay.

The development of the dark-colored calcareous soils from the Selma chalk formation or other highly calcareous clays or marls can be traced from the chalk, marl, or soft limestone through Sumter clay to Houston clay. Theoretically the associated acid post oak prairie soils may be traced from Houston clay through Eutaw clay and Vaiden clay to Oktibbeha clay. The post oak prairie soils, however, may have developed on heavy clays occurring as lenses in the chalk or superimposed on the chalk after the chalk formation had eroded to its present elevation.

The elevation of the Black Belt ranges from 150 to 200 feet lower than that of the surrounding hills, a condition which suggests that erosion of the overlying materials was more rapid and more uniform above the soft limestone formation than it was in the areas underlain by more pervious materials. For the most part the removal of the overlying mantle left the Selma chalk formation exposed. The exposed crumbly somewhat plastic grayish-yellow or yellowish-white calcareous clay, locally called rotten limestone, generally overlies a second formation, a whitish-gray slightly hardened soft limestone. The upper or calcareous clay may be seen exposed along the southern border of the chalk formation in Sumter County. The soft limestone occupies by far the greater part of the area.

Much of the soil material from which the dark-colored calcareous soils and their associated post oak prairie soils developed was derived from weathering of the Selma chalk in place. Some may have been weathered in place from other superimposed heavy clay materials. Some of the weathered material was transported from higher positions and deposited as alluvial material on the immediate slopes or at the base of the slopes. This discussion is limited only to those soils developed from the residual material of the chalk and assumes that the acid clay soils under consideration are also derived from the chalk. With this assumption the Sumter clay is traced to the Oktibbeha clay.

The weathering of the exposed soft limestone and the soil-forming processes start almost simultaneously, but weathering progresses faster than the soil-forming processes for a time. The exposed rock crumbles, especially by flaking, through alternate wetting and drying. Hard freezes in the winter frequently crack it into large flat pieces ranging from 3 to 5 inches in thickness. In the Black Belt freezing seldom penetrates the soil or rock to a depth of more than 4 inches, therefore, its aid in weathering is unimportant except on the exposed rock. The rock once broken loose crumbles quickly into irregular fragments from less than one-fourth of an inch to more than 5 inches thick. As an accumulation of crumbled chalk material 1 or 2 inches thick is enough to allow seeds to sprout and plants to grow sufficiently to add organic matter to the raw material, it does not take long before the soil-building processes begin to operate.

Sumter clay is assumed to be the first soil to form from the chalk, although in some places this soil has been considered eroded Houston material. It may be called an immature Rendzina. Rendzina is a term applied to an intrazonal group of soils with a dark-gray or black surface layer overlying light-gray or white soft highly calcareous material. The surface soil of Sumter clay is gray granular clay, which in most uncultivated areas contains enough organic matter to give the material a dark-gray color to a depth of 1 or 2 inches below the surface. The gray granular clay passes into gray crumbled chalk at a depth ranging from 5 to 12 inches, and the crumbled chalk rests on the unweathered chalk between depths of 8 and 25 inches. As the weathering and soil-forming processes continue, the profile becomes deeper. The accumulation of organic matter increases to a depth ranging from 4 to 8 inches in the upper part of the granular clay that overlies the crumbled chalk reached between 12 and 18 inches below the surface. Soils with profiles of this type have been mapped Houston clay but in later years have been mapped in Alabama as a dark-surface phase of Sumter clay.

Areas of Sumter clay range from flat to rolling or even hilly. The hilly areas are chiefly exposed chalk. Houston clay in the Black Belt of Alabama is flat, gently sloping, or gently rolling, Eutaw clay is predominantly flat or very gently sloping, and Vaiden clay is undulating or gently sloping. In places Vaiden clay occurs in areas with broken relief. The Oktibbeha soil has, on the whole, the best relief for optimum soil development.

Leaching of the calcium carbonate starts as soon as the other soil-forming processes start, but because the parent material consists of 50 to 75 percent or more of calcium carbonate the effects of leaching are not so noticeable at first.[8] The controlling soil-forming agent is the grass vegetation, which is followed by decomposition through bacterial action, strong base cycle, accumulation of organic matter, and some loss of calcium carbonate by leaching. Therefore, as the calcium carbonate is diminished, the silt, together with the sesquioxides and clay, is concentrated. As the organic-matter content increases, Sumter clay gradually develops into Houston clay, a true Rendzina.

The first stage is Houston clay, shallow phase. The average profile of this soil consists of A_1, 0 to 2 inches, black or very dark gray somewhat granular clay; A_2, 2 to 12 inches, very dark gray or black heavy plastic clay that breaks up into sharply angular medium-nut structured aggregates; B_1, 12 to 17 inches, somewhat plastic yellowish-gray or creamy dark gray clay containing small fragments of chalk or small lime concretions; C_1, 17 to 26 inches, crumbled chalk, which rests on the unweathered limestone. Because sheet erosion is constantly more or less active, the surface of this soil is at a somewhat lower elevation than that of Sumter clay. The soil-forming processes are continuous, and as the thickness of the profile increases, Houston clay, shallow phase, changes to Houston clay.

The stage of development represented by Houston clay shows the following profile: The 4-inch surface layer is black heavy plastic clay containing some small brown specks and numerous minute fairly hard lime nodules. Under moderately dry conditions the soil mass breaks to a medium coarse angular nut structure and when crushed breaks into fine granules. The subsurface layer breaks up into irregular angular fragments, which are very hard when dry. This layer contains considerable partly decomposed roots, stems, and other organic matter. Without much change in color the soil material

[8] See publication cited in footnote 7, p. 73.

continues to a depth of about 10 inches, with no apparent change in texture. Between depths of 10 and 25 inches the material is very dark gray heavy plastic clay with an olive-drab shade when wet, but it is slightly brown when dry. When moderately dry the mass breaks up into medium-large to large irregular-shaped clods. Below a depth of 25 inches the soil is dark olive-gray heavy plastic clay. When crushed the mass has a somewhat yellow shade, indicating that the coatings along the moderately well defined cleavage lines are darker than the interiors of the fragments. In this layer the lime nodules are more numerous than in the layer above, and they continue to increase with depth. At a depth of 36 inches the soil grades into dark olive-gray plastic clay, and at a depth of 50 inches it is definitely more yellow and continues to become more yellow until it reaches the crumbled chalk layer. The depth to the crumbled chalk ranges from about 30 to 62 inches and the depth to the chalky limestone ranges from about 34 to 72 inches, but in some areas no hard chalky limestone is present at a depth of 72 inches.

Grasses, together with some briers, canebrakes, and small shrubs predominate on this soil. The return of calcium has been sufficient to maintain an alkaline reaction throughout the profile, but, as leaching of the calcium carbonate continues beyond this stage, the A_2 horizon becomes slightly acid. Tree vegetation, especially post oak, makes its appearance. Whether the tree vegetation encroaches on the alkaline soil or follows after the soil becomes acid has not been ascertained.

Eutaw clay is the acid soil closely associated with the Houston. In addition to the suggestion that Eutaw clay is a later stage in soil development than Houston clay, it is probable that Eutaw clay has developed in places from beds of heavy clay superimposed on Selma chalk. Eutaw clay, a gray post oak prairie soil, occupies rather flat areas having poor external and very slow internal drainage. The areas with more favorable surface drainage give rise to the Vaiden or Oktibbeha soils. Eutaw clay supports a rather dense growth of trees, especially of young post oaks, which shade the ground so thoroughly that there is practically no grass or underbrush. In densely timbered heavy clay areas, sheet erosion is fairly active. The A_1 horizon of Eutaw clay in most places is thin and is brownish dark-gray or dark-brown granular silty clay, in places clay loam. The A_2 horizon is brownish-gray granular plastic clay or silty clay mottled with yellow and brown. Below this layer is a transitional layer from the A_2 to the B_2 horizon, about 2 inches thick, consisting of brownish-yellow plastic clay mottled with gray and yellow. The B_2 horizon, between depths of 7 and 36 inches, is pale-gray very plastic and very sticky clay mottled with gray, brown, dark yellow, and in places at the lower depths with red. The next layer, between the B_2 and the crumbled chalk, is a transitional layer, which shows greater variations than any of the other layers. In most places it is bluish-gray very plastic and sticky clay mottled with yellow and yellowish brown. Where leaching has not progressed very far, it is more yellow in color and alkaline in reaction, especially in the lower part. In the description of a deep profile of Eutaw clay in Hale County, Ala., it is stated that lime nodules are conspicuous below a depth ranging from 60 to 70 inches, that friable grayish-yellow clay lies at a depth of about 75 inches, and that the Selma chalk may be present at a depth of 85 inches. It, also, is stated that the soil is acid to a depth of 55 inches and neutral to alkaline below.[9]

The transition from Eutaw clay to Vaiden clay is shown by a gradual change in color from gray to grayish yellow in the A_2 horizon and by fairly bright yellow clay mottled with gray, brown, and red in the B_1 horizon and the upper part of the B_2 horizon. In the first stages the ferric oxide is in the hydrated form, which gives the yellow color, but as better aeration is established it gradually changes to the dehydrated form, which increases the degree of redness. It is also possible that the degree of redness is determined by the size of the ferric oxide particles. In the Vaiden soil the vegetation continues to be predominantly post oak, but pines are increasing in number over those growing on Eutaw clay. The podzolic action has been more or less active in Eutaw clay and continues active in Vaiden clay, but because of the tight sticky clay subsoil the amount of water percolating through the soil is greatly reduced after the soil becomes acid.

Oktibbeha clay differs from Vaiden clay largely in having a greater content of the red ferric oxide, but other differentiating characteristics are commonly present. Although called by many the red post oak prairies, Oktibbeha clay has developed under a tree vegetation with a higher proportion of conifers than Vaiden clay or Eutaw clay and more grasses, especially sedge grasses. The virgin areas in some places had a thin covering of fine sandy loam over the clay. In most areas the 0- to 2-inch surface layer is reddish dark-brown clay loam or loam with a granular structure. From 2 to 5 inches the material is reddish-brown somewhat friable silty clay, which changes to red or reddish-brown stiff clay that continues to a depth of about 14 inches. The color of the upper part is rather uniform, and the material becomes intensely mottled with yellow in the lower part. Below the heavy stiff B horizon is bluish-gray or gray plastic clay intensely mottled with red and yellow, and this material continues to the crumbled chalk which lies at a depth ranging from 24 to 34 inches below the surface. The crumbled chalk grades at various depths into the unweathered chalk.

Table 9 gives the chemical composition of four soils from the Black Belt section of Alabama, together with their silica-sesquioxide ratios.

TABLE 9.—*Chemical composition of the colloids from the soil profiles of typical Black Belt soil types and their silica-sesquioxide ratios*[1]

Soil type and sample No.	Depth	SiO_2	Al_7O_9	Fe_3O	P_2O_5	TiO	$\frac{SiO_2}{R_2O_3}$	$\frac{SiO_7}{Al_2O_3}$
	Inches	*Percent*		*Percen*	*Percent*	*Percent*		
Oktibbeha clay, 710	0- 2	37 639		9 5500	0. 1011	1 3700	1 84	3.28
	2- 6	39 623		10 8600	.0775	1 3260	1 83	2 25
	6-12	42 755		9 7100	0378	1 1960	1 90	2 42
	12-18	44 012		9 0700	0364	1. 1540	1 92	2 25
Eutaw clay, 722	0- 4	43. 855		9 7704	. 1116	8000	2 18	2 67
	4-14	45 655		8 9632	.0659	8320	2 31	2 78
Sumter clay, 732	0- 4	44 440	26	8 9032	.6760	.0784	2 38	2 89
Houston clay, 739	0- 6	37 010	27.	8 9831	.6500	0928	1.90	2.30

[1] From Alabama Agricultural Experiment Station Bulletin 237.

[9] EDWARDS, M. J., WILLIAMS, B. H., GRAY, A. L., WONSER, C. H., STEPHENS, M. E., and SWANN, M E. SOIL SURVEY OF HALE COUNTY, ALABAMA. U. S. Bur. Chem. and Soils Ser. 1935, No. 4, 60 pp., illus. 1939.

SUMMARY

Sumter County is in the west-central part of Alabama. It borders the Mississippi State line and includes an area of 908 square miles, or 581,120 acres.

The county may be divided into four topographic divisions, namely, (1) rolling, rough, and broken uplands, (2) undulating to rolling uplands, (3) gently undulating to gently sloping uplands, and (4) flat to undulating first and second bottoms.

The first division, locally known as sand hills, occupies the major divides and forms the highest ridges and plateaus in the county. The largest area, including perhaps the highest elevations, extends from Belmont in a northwesterly direction beyond Sumterville. The elevation ranges from about 300 to more than 400 feet above sea level. Small level areas occur on the ridge tops. The second division, or Black Belt, includes most of the uplands with rolling to undulating relief and ranges in elevation from 120 to 250 feet. Drainage in this division generally is good. The uplands of the third division, or flatwoods, range in elevation from 100 to 200 feet. The soils are heavy clays, and drainage generally is poor. The fourth division comprises the bottom lands and low terraces bordering the Tombigbee River and the larger streams, part of which are subject to overflow. The elevation here also ranges from 100 to 200 feet above sea level.

This county lies wholly within the drainage basin of the Tombigbee River. The Noxubee River, Factory Creek, and Jones Creek in the northern part, the Sucarnoochee River and Spring Creek in the south-central and southeastern parts, and Cotohaga and Kinterbish Creeks in the southern part are the main tributaries of the Tombigbee. In the main, the county is well to excessively drained, although some areas are wet most of the year.

Livingston, the county seat, with a population of 1,072, and York, with a population of 1,796, are the largest towns. The total population of the county, as reported by the 1930 census, is 26,929.

Four railroads serve the county adequately. United States Highways Nos. 11 and 80 and State highways pass through the county.

Climatic and seasonal conditions are favorable for the raising of livestock, for forestry, and for growing agricultural products, which constitute the major sources of revenue. Long warm to hot summers and short mild winters are the general rule. The high rainfall is fairly well distributed throughout the year.

The widely different soils of the comparatively level to steep hilly sandy uplands, heavy alkaline clay lands, post oak prairie or acid clay land, and overflow bottoms and terraces may be placed in six groups, based on land use.

Group 1 includes those soils best suited to the production of general farm crops. These soils have favorable relief, are absorptive and retentive of moisture, are easy to till, are very responsive to fertilization, and are well suited to practically all crops commonly grown in this section. The group comprises Red Bay fine sandy loam, Orangeburg fine sandy loam, Ruston fine sandy loam, Vaiden fine sandy loam, Cuthbert fine sandy loam, Norfolk fine sandy loam, Pheba loam, Amite fine sandy loam, Cahaba fine sandy loam, Wick-

ham fine sandy loam, Kalmia fine sandy loam, Vaiden fine sandy loam, terrace phase, Altavista loam, Leaf fine sandy loam, and Ochlockonee fine sandy loam.

Group 2 includes soils best suited to the production of peanuts, fruits, cotton, oats, winter legumes, and corn. This group includes fair to good soils. The members of this group are extremely sandy, are level to gently sloping, can be tilled with light equipment, and warm extremely early in the spring. On the other hand, plant nutrients are very readily leached and an insufficient supply of moisture is retained for the production of large yields of summer growing crops. Ruston loamy fine sand, Cahaba loamy fine sand, and Kalmia loamy fine sand comprise the group.

Group 3 includes calcareous soils best suited to pasture, corn, oats, and hay. The best pastures in the county are maintained on these soils, owing to the influence of the underlying calcareous or limy material. The pasture grasses, such as Dallis grass, black medic, and white Dutch clover, hay crops, and grain do especially well. Livestock raising is the chief enterprise. The soils of this group are Houston clay, Sumter clay, Sumter-Oktibbeha clays, Sumter-Oktibbeha clays, rolling phases, Bell clay, Bell clay, flat phase, Catalpa clay, Catalpa clay, sanded phase, and Catalpa clay, high-bottom phase.

Group 4 includes acid soils best suited to forest, pasture, and farm crops. The land is known as post oak prairie. The soils are heavy and sticky, being clays and heavy loams, and they require much power in the spring to prepare them for crops. On drying, the soils check and crack greatly. The reaction is very acid, and a large quantity of lime must be used for the best yields of crops. Phosphate fertilizer especially is needed. The soils are best suited to pasture grasses, such as lespedeza, carpet grass, Dallis grass, and hop clover, and to cotton, oats, and forest. The members of this group are Vaiden loam, Vaiden silty clay, Eutaw clay, Eutaw loam, Wilcox clay, Lufkin clay, Vaiden loam, terrace phase, Eutaw clay, terrace phase, and Eutaw loam, terrace phase.

Group 5 includes soils that are very severely rolling to hilly and much mixed and therefore are suited mainly to forest, kudzu, and cover crops. Susceptibility to erosion more or less precludes their use for farm crops, except in small areas of not more than 2 or 3 acres, each. Forestry, range-land pasture, and game preserves are their best uses. The components of this group are Wilcox fine sandy loam, Wilcox clay, rolling phase, Ruston fine sandy loam, rolling phase, Ruston loamy fine sand, rolling phase, Cuthbert fine sandy loam, hilly phase, Vaiden fine sandy loam, rolling phase, Sumter clay, eroded phase, Sumter-Vaiden complex, hilly phase, and Guin soils, undifferentiated.

Group 6 is composed of imperfectly and poorly drained soils suited mainly to forest and range-land pasture. A few selected better drained areas produce excellent yields of corn, sorghum, and hay crops. The poor or imperfect drainage is due to overflows or a level to slightly depressed position. Forestry and pasture are the chief uses of this land. Adequate artificial drainage must be provided before extensive areas can be used for farm crops. Pheba fine sandy loam, Pheba loam, flat phase, Augusta silt loam, Kalmia-Myatt fine sandy loams, Leaf clay, Leaf fine sandy loam, flat phase, Ochlockonee silt loam, Chastain very fine sandy loam, Myatt fine sandy loam, alluvial soils, undifferentiated, and swamp constitute this group.

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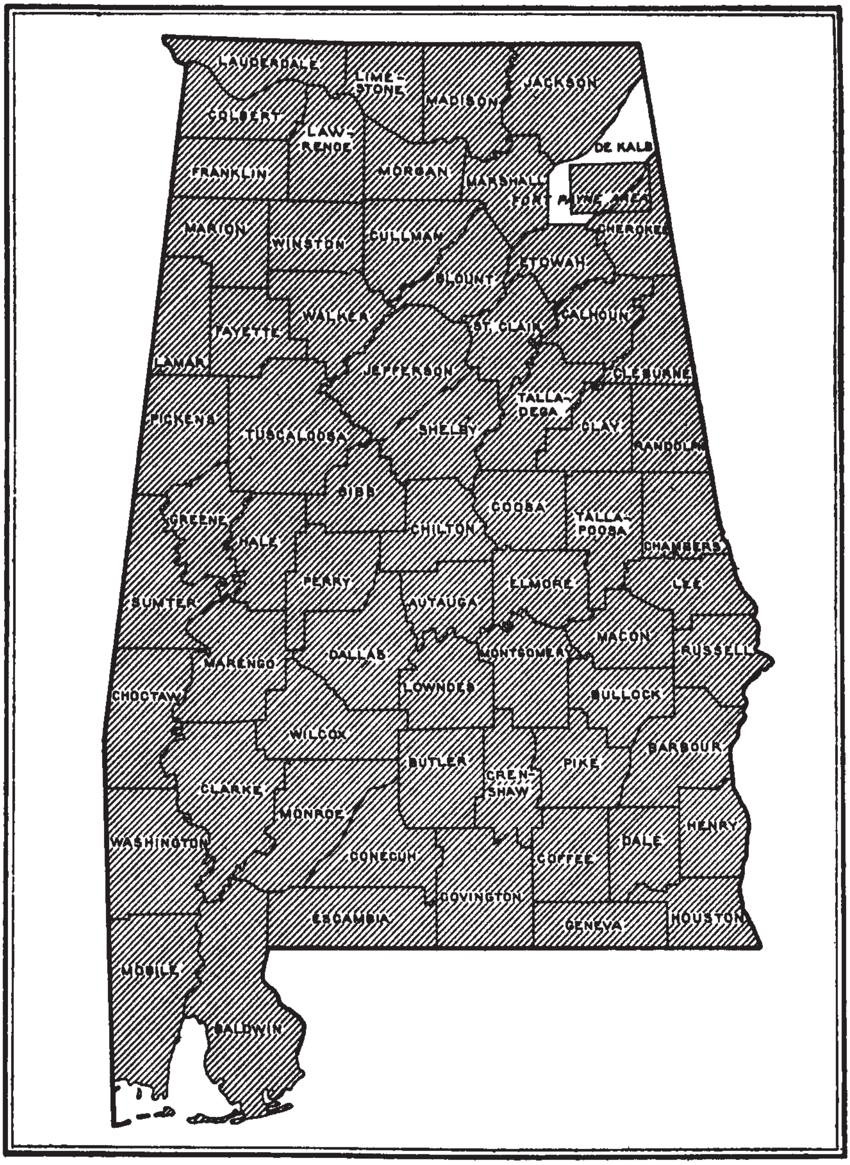

Areas surveyed in Alabama shown by shading.

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