Series 1937, No. 11 Issued November, 1944

Soil Survey

Macon County Alabama

By
CLARENCE LOUNSBURY, in Charge, ROBERT WILDERMUTH
G. A. SWENSON, and M. M. STRIKER
United States Department of Agriculture
and
L. G. BRACKEEN, HOYT SHERARD, C. L. McINTYRE, and V. O. CALLAHAM
Alabama Department of Agriculture and Industries

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
Bureau of Plant Industry, Soils, and Agricultural Engineering
In cooperation with the
Alabama Department of Agriculture and Industries

For sale by the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C. Price 50 cents

HOW TO USE THE SOIL SURVEY REPORT

SOIL SURVEYS PROVIDE a foundation for all land use programs. This report and the accompanying map present information both general and specific about the soils, the crops, and the agriculture of the area surveyed. The individual reader may be interested in the whole report or only in some particular part. Ordinarily he will be able to obtain the information he needs without reading the whole. Prepared for both general and detailed use, the report is designed to meet the needs of a wide variety of readers of three general groups: (1) Those interested in the area as a whole; (2) those interested in specific parts of it; and (3) students and teachers of soil science and related agricultural subjects. Attempt has been made to meet the needs of all three groups by making the report comprehensive for purposes of reference.

Readers interested in the area as a whole include those concerned with general land use planning—the placement and development of highways, power lines, urban sites, industries, community cooperatives, resettlement projects, and areas for forest and wildlife management and for recreation. The following sections are intended for such users: (1) County Surveyed, in which physiography, vegetation, water supply, population, and cultural developments are discussed; (2) Agricultural History and Statistics, in which a brief history and the present status of the agriculture are described; (3) Estimated Yields, in which acre yields of the principal crops are given for each soil; (4) Land Uses and Agricultural Methods, in which the present use and management of the soils are described, their management requirements are discussed, and suggestions for improvement in management are made.

Readers interested chiefly in specific areas—as some particular locality, farm, or field—include farmers, agricultural technicians interested in planning operations in communities or on individual farms, and real estate agents, land appraisers, prospective purchasers and tenants, and farm loan agencies. These readers should (1) locate on the map the tract with which concerned; (2) identify the soils on the tract by locating in the legend on the margin of the map the symbols and colors that represent them; and (3) locate in the table of contents in the section on Soils and Crops the page where each type is described in detail and information given as to its suitability for use and its relations to crops and agriculture. They will also find useful specific information relating to the soils in the sections on Estimated Yields and Land Uses and Agricultural Methods.

Students and teachers of soil science and allied subjects—including crop production, forestry, animal husbandry, economics, rural sociology, geography, and geology—will find their special interest in the section on Morphology and Genesis of Soils. They will also find useful information in the section on Soils and Crops, in which are presented the general scheme of classification of the soils of the area and a detailed discussion of each type. For those not already familiar with the classification and mapping of soils, these subjects are discussed under Soil Survey Methods and Definitions. Teachers of other subjects will find the sections on County Surveyed, Agricultural History and Statistics, Estimated Yields, and the first part of the section on Soils and Crops of particular value in determining the relation between their special subjects and the soils of the area.

This publication on the soil survey of Macon County, Ala., is a cooperative contribution from the—

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

ROBERT M. SALTER, *Chief*

Division of Soil Survey

CHARLES E. KELLOGG, *Head Soil Scientist, in Charge*

ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

R. J. GOODE, *Commissioner*

L. G. BRACKEEN, *in Charge Soil Survey*

Series 1937, No. 11. Issued November, 1944

SOIL SURVEY OF MACON COUNTY, ALABAMA

By CLARENCE LOUNSBURY, in Charge, ROBERT WILDERMUTH, G. A. SWENSON, and M. M. STRIKER, Division of Soil survey,[1] Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture, and L. G. BRACKEEN, HOYT SHERARD, C. L. McINTYRE, and V. O. CALLAHAM, Alabama Department of Agriculture and Industries

Area inspected by W. EDWARD HEARN, Senior Soil Scientist

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

CONTENTS

[1] The field work for this survey was done while the Division of Soil Survey was a part of the Bureau of Chemistry and Soils.

COUNTY SURVEYED

Macon County is in the east-central part of Alabama (fig. 1). The county is almost rectangular, having a maximum distance from north to south of about 25 miles and a maximum distance from east to west of 34 miles. Tuskegee, the county seat, is 40 miles by air line east of Montgomery, Ala., and about 42 miles west of Columbus, Ga. The total area of the county is 614 square miles, or 392,960 acres.

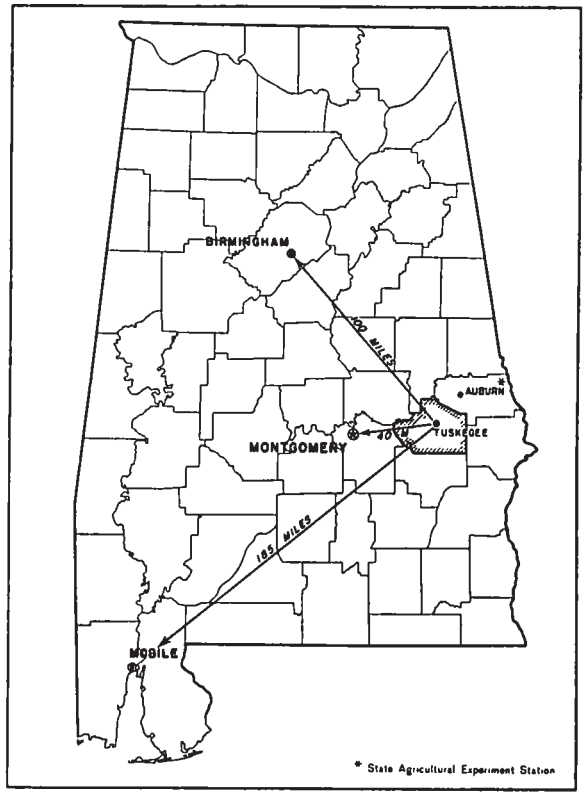

FIGURE 1.—Location of Macon County in Alabama.

The county includes four main physiographic divisions (fig. 2). These are (1) a few broad, fairly level, high plains, (2) comparatively broad second bottoms or terraces and first bottoms along the larger streams, (3) a narrow strip of gently rolling plains (Black Belt), and (4) dissected hill lands.

The broad, fairly level or undulating plains are often referred to as the Notasulga area, Tuskegee Ridge, Shorters Ridge, Society Hill area, and Creek Stand Ridge. These areas are comparatively level and occupy some of the higher elevations. The Notasulga area, in the northwestern part, is the largest and most nearly level upland part of the county. In general the elevation of this area ranges from 530 to 550 feet above sea level. The highest elevation recorded, 600 feet, is in this area in the northeastern corner of sec. 6, T. 18 N., R. 23 E. The Tuskegee Ridge, a relatively small area, is in the central part of the county. Tuskegee, on the highest point of this ridge, has an elevation of 459 feet. Shorters Ridge, which lies in an east-west direction, occupies a small area in the western part. The elevation at Shorter (post office) is 310 feet. The Society Hill area in the northeastern part is rather large, but most of it is within Lee County. Society Hill is 470 feet above sea level. In the southeastern part a high, narrow east-west ridge lies between and sur-

rounding Warriorstand and Creek Stand. The elevation of this area is probably between 400 and 500 feet.

These areas and ridges, totaling about 38 percent of the area of the county, are remnants of a broad, level plain that once covered the country. This broad plain was dissected and broken by large and small streams.

Broad second bottoms or terraces together with the first bottoms occur in the vicinity of the larger streams. The principal areas border the Tallapoosa River and Eufaupee, Cubahatchee, Line, and

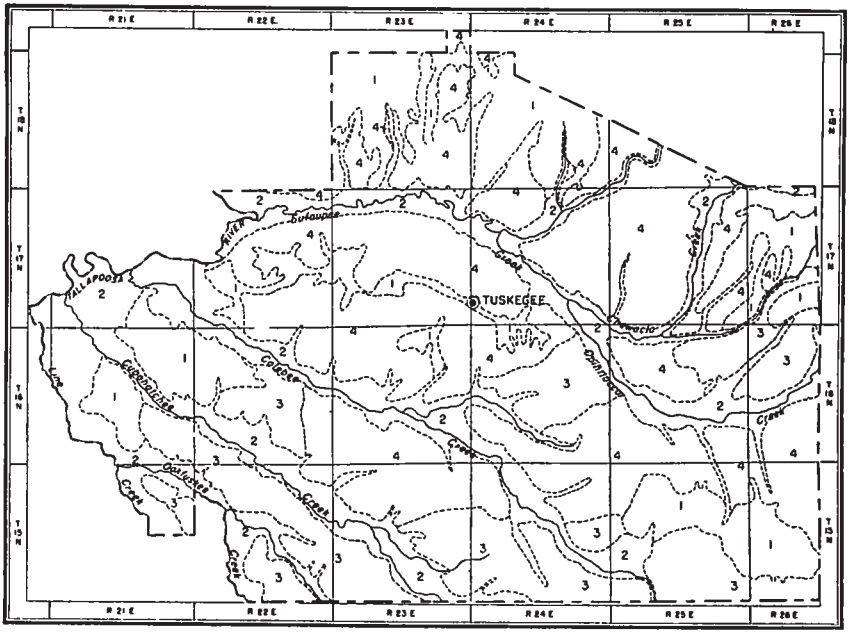

FIGURE 2.—Sketch map showing physiographic divisions of Macon County, Ala.: 1, Level to undulating plains or plateaus; 2, stream terraces and first bottoms; 3, gently rolling plains (Black Belt); and 4, dissected hill lands.

Old Town Creeks and some of their larger tributaries. These areas are practically level and total about 34 percent of the area of the county. The elevations are rather uniform, ranging from 200 feet near the mouth of Line Creek to 269 feet along Eufaupee Creek where it crosses United States Highway No. 80.

An area of Black Belt or prairie land extends across the southern part of the county from Line Creek to the southeastern corner. This area, comprising about 10 percent of the area of the county, is narrow but is about 24 miles long. In general the area is undulating to gently rolling, and the elevations range from about 300 to 340 feet.

Surrounding the plains and ridges are broad extensive areas of severely eroded land comprising approximately 27 percent of the area of the county. The largest and most extensive bodies are near the Tallapoosa River and include a large part of the drainage area of Eufaupee Creek and its tributaries. Other severely broken and hilly areas occur as continuous bodies across the southern part of the

county, extending from a point near Hardaway to the Macon-Russell County line in the vicinity of Boromville. The elevation of these areas ranges from about 250 feet around the foothills to 500 feet on the higher positions.

Most of Macon County lies in a belt of longleaf, loblolly, and slash pine.[2] The original growth consisted of several species, of which the longleaf was the most abundant. Scattered stands of oaks, gums, and other deciduous trees were interspersed with pines, especially along the larger streams. The pine forest originally presented a parklike appearance, and much of the more open spaces was covered with coarse grasses and low shrubs.

As the land became occupied, the virgin timber was removed. For the most part this disappeared about 25 or 30 years ago. Since that time second-growth timber has come in and is gradually increasing in value. Longleaf pine is prominent in the central part of the county, together with many trees of shortleaf species, such as loblolly and rosemary pines. On the well-drained uplands there are several species of oaks, such as white, water, red, and post oaks. Blackjack oak is common, especially on the more rugged areas and sandy, gravelly ridges. The uplands and much of the bottoms are forested, largely with sweetgum together with considerable hickory, elm, ironwood, dogwood, and some cedar and miscellaneous species. The undergrowth consists chiefly of mountain-laurel, woodbine, ivy, briers, and honeysuckle. In old fields persimmon, sassafras, sumac, yellow jessamine, many wild flowers, and much broomsedge are common. Blackberry and wild dewberry grow abundantly. Along stream courses there is much white oak, water oak, beech, bay, sycamore, ironwood, magnolia, holly, ash, yellow birch, hawthorn, willow, small cane (switch cane), and in places palmetto. In old stream channels and spots that are wet throughout the year much water tupelo (tupelo gum) and cypress grow.

Originally the small prairie area along the southern border of the county supported an abundance of tall, luxuriant, and comparatively deep-rooted grasses, together with a wide variety of herbaceous flowering plants. These have given way largely to Johnson grass, Dallis grass, carpet grass, broomsedge, lespedeza, black medic, and sweetclover. Primrose, wild barley, cocklebur, daisy, and thistles are common. Bordering the prairie area and tending to encroach upon it is a growth of larger trees—oldfield pine, post and blackjack oaks, sweetgum, and hickory.

Good water for domestic purposes is easily obtained in most parts of the county from wells 20 to 40 feet deep. In many localities springs furnish excellent water.

Macon County was created by an act of the State legislature, December 18, 1832. It was formed from territory ceded by the Creek Indians. The county was named in honor of Nathaniel Macon, a distinguished soldier of North Carolina. After the Indians left Alabama in 1836, white settlers from Georgia, Tennessee, the Carolinas, and Virginia rapidly occupied the general area that includes Macon County. The Federal census of 1940 reports a population of 27,654, all classed as rural except 3,937, which is the population of

[2] SHANTZ, H. L., and ZON, RAPHAEL. NATURAL VEGETATION. *In* Atlas of American Agriculture, pt. 1., The Physical Basis of Agriculture, Sect. E, U. S. Dept. Agr. Adv. Sheets No. 6, 29 pp., illus. 1924.

Tuskegee. In 1940 native white persons composed 17.8 percent and Negroes 82.1 percent of the population.

Tuskegee is the county seat and principal business town. Notasulga, which had a population of 863 (including those who resided in Lee County) in 1940, is the next most important business center.

Smaller railway shipping points in the northern part of the county include Franklin Station, Milstead, Shorters Station, and Tysonville. Hannon, Roba, Fort Davis, Hardaway, and Chesson are the main shipping points in the southern part. Hurtsboro, in Russell County, serves some of the southeastern part.

Two railroads from Montgomery pass through the county. The Western Railway of Alabama passes through the northwestern part of the county, and a branch of the Seaboard Air Line crosses the southern part. The Tuskegee Railroad provides railway service to Tuskegee and to Tuskegee Institute. In the southeastern part is a line of the Central of Georgia Railway, which crosses the Seaboard Air Line at Hurtsboro. United States Highway No. 29, passing through Tuskegee, connects with Atlanta, Ga., on the north, and Troy, Ala., on the south. A paved State highway leads north from Tuskegee to Notasulga. United States Highway No. 80, crossing the county from east to west through Tuskegee, connects with Columbus, Ga., and Montgomery, Ala. A graded State highway extends west of Notasulga. County roads, more or less graveled, afford easy access to all the farming districts.

Adjacent to Tuskegee is the Tuskegee Normal and Industrial Institute, nationally known for its leadership in promoting Negro education and culture. A veterans' hospital is near Tuskegee.

Good schools are provided for both white and Negro children, and transportation is furnished to centralized schools. Rural electrification is being extended over the county. All the towns and many of the houses have telephones. Churches and modern schoolhouses are well distributed.

CLIMATE

The climate of Macon County is mainly continental. The summers are long and warm and the winters short and mild. The temperature at Tuskegee is more uniform than in the northern part of the State because it is influenced by the Gulf of Mexico. The average annual temperature at Tuskegee, which has an elevation of 459 feet above sea level, is 65.5° F., and the average annual precipitation is 46.05 inches. These figures are representative for the higher lying parts of the county. In some of the valleys at elevations of 200 feet, the temperature and precipitation vary somewhat from those at Tuskegee.

The date of the last average killing frost is March 15, and that of the first is November 14, giving an average frost-free season of 244 days. Killing frosts, however, have occurred as late as April 26 and as early as October 21. The ground may freeze to a depth of 1 or 2 inches during the winter. Generally freezes are followed by clear, mild weather, brisk winds, and rising temperature, and these, in turn, are usually followed by increased cloudiness and rain. Freezes kill some of the boll weevils and other insect pests. Flurries of snow may occur during the winter, but seldom is the snowfall enough to

cover the ground. The average annual snowfall is only 0.5 inch. The heaviest rainfall occurs during the winter and early spring and the lightest in late summer and fall. This distribution of rainfall is favorable for the maturing and harvesting of cotton and other crops. Occasionally insufficient rainfall during the growing season causes considerable damage to crops.

Frost-resistant plants, such as collards, cabbage, onions, and radishes, as well as oats, rye, rape, and winter cover crops, maintain green growth during the winter and ordinarily make moderate progress, especially if planted early. Because of favorable weather, much farm work can be done during the winter.

Very little damage results from high winds. Occasionally tornadoes do some local damage. The strongest winds are northerly and westerly in winter and southerly or variable in summer. The summer days are frequently hot and sultry, but the nights are cooled by breezes, usually from the southeast.

Table 1, compiled from the records of the United States Weather Bureau station at Tuskegee, is representative of climatic conditions for the greater part of the county.

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

[Elevation, 459 feet]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total for the driest year (1931)	Total for the wettest year (1912)
	° *F*	° *F.*	° F.	*Inches*	*Inches*	*Inches*
December	49 3	81	10	5 15	7 70	6 54
January	49 2	81	6	4 15	3 75	8 52
February	50 6	82	8	5 16	3 23	5 19
Winter	49 7	82	6	14 46	14 68	20 25
March	57. 6	92	18	5. 26	1 78	11 56
April	64 7	93	31	3 76	1 44	12 42
May	72 5	102	41	3 16	63	1 85
Spring	64 9	102	18	12 18	3 85	25 83
June	78 9	107	47	2 89	55	3 35
July	81 0	105	57	4 44	3 56	6 23
August	80 8	104	59	3 86	4 11	8 03
Summer	80 2	107	47	11. 19	8. 22	17 61
September	77 5	105	42	2 56	(1)	5 94
October	67 2	99	28	2 46	76	2. 05
November	56 7	88	18	3 20	1. 72	2. 31
Fall	67 1	105	18	8 22	2 48	10. 30
Year	65 5	107	6	46 05	29 23	73. 99

[1] Trace

AGRICULTURAL HISTORY AND STATISTICS

Macon County is and always has been predominantly agricultural. As reported by the 1850 census, cotton was the leading crop, but in later years its acreage declined. The 1850 census reported a produc-

tion of 29,089 bales [3] and the 1860 census a production of 41,119 bales. Another peak in production was reached in 1909, when 21,168 bales of cotton was produced on 89,769 acres. Between 1929 and 1939 the acreage declined sharply from 69,883 acres to 36,322 acres, but the production declined less sharply from 18,598 bales to 15,404 bales. Corn likewise had a correspondingly larger production in the earlier years, although the acreage is now more than double that reported in 1879. In 1850, rice, which is no longer grown, produced 191,140 pounds, and in 1860, 6,355 pounds. During this earlier period both sheep and swine were raised in larger numbers than today. In 1850 the census reported 10,222 sheep and 56,743 swine, and in 1860, 5,821 sheep and 44,775 swine. The 1940 census shows some increases in the numbers of livestock over the numbers reported in 1930.

These changes are accounted for in part by the disruption of economic conditions during and after the Civil War and the gradual adjustment of the demand for agricultural products in more recent years. As the demand for cotton decreased, many farmers practiced diversified farming and grew more subsistence crops; consequently a greater acreage was planted to corn, hay, sweetpotatoes, peanuts, peas, and fruits.

A comparative study of the acreages devoted to the leading crops for the last seven census years is presented in table 2, compiled from the United States census reports.

TABLE 2.—*Acreages of principal crops in Macon County, Ala., in stated years*

Crop	1879	1889	1899	1909	1919	1929	1939
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
Corn	23,833	26,803	40,143	35,889	48,995	41,483	58,164
Cotton	50,763	50,134	69,441	89,796	58,123	69,883	36,322
Oats, threshed	6,195	4,440	2,517	3,804	939	698	1,758
Oats, cut and fed unthreshed						1,918	2,084
Sugarcane for sirup	140	586	1,047	490	271	496	871
Sorgo for sirup		474	70	61	500	498	435
Sweetpotatoes	928	1,174	1,049	1,187	1,059	1,141	1,411
Dry peas		29	1,987	3,222	3,555	891	5,133
Dry beans			20	17	185	84	2,478
Peanuts		228	461	294	561	727	4,535
All hay and sorghums for forage		198	170	1,443	1,492	1,570	5,505
Legumes for hay					570	277	4,125
Sorghums for silage, hay, and forage						284	106
Other tame hay			153	1,173	818	331	1,045
Wild hay			17	270	104	678	169

Market-garden vegetables, chiefly watermelons, sweet corn, and string beans, were grown on a total of 147 acres in 1939. In 1939 the value of garden vegetables, except potatoes and sweetpotatoes for home use, produced on 2,855 farms was $109,230.

Peaches lead all other orchard fruits. In 1939, 10,919 bushels of peaches were harvested from 12,932 trees, 3,425 bushels of pears from 1,182 trees, 2,700 bushels of apples from 2,219 trees, and 15,162 pounds of grapes from 1,022 vines. Land devoted to fruit orchards, vineyards, and planted nut trees increased from 377 acres in 1930 to 800 acres in 1940.

A few dairy cattle are kept on most of the farms in order to supply

[3] The Federal census for 1850 and 1860 reported the production of cotton in 400-pound bales, whereas the census of 1880 and later censuses reported it in 500-pound bales.

home needs and some surplus of milk or butter for sale. In recent years a few farms have specialized in the production of milk and cream to supply residents of Tuskegee, either by house-to-house delivery or through stores. The veterans hospital near Tuskegee uses a large part of the milk. A larger number of cows were milked in 1934 than in 1939—4,867 as compared with 4,214. The production of milk decreased during the same period from 1,530,362 gallons to 1,314,528 gallons. The production of milk was reported by 2,333 farms, or about two-thirds of all farms in 1939.

Many cows are of mixed breeds, but Jersey is the most popular. Some Guernseys and Holstein-Friesians are kept. The dairy cattle are bred largely on the farms, although some are purchased. The better dairy herds have pure-bred sires. Occasionally Bang's disease (contagious abortion), breaks out among the cattle, but tuberculosis seldom occurs.

The larger dairy farms are equipped with power milkers, refrigerators, and bottling facilities, as well as silos, either the upright or the trench type. Part of the concentrated feeds are purchased; the rest are home-grown products, such as oats, corn, velvetbeans, and hay.

Some beef cattle are raised, especially in the southern part of the county. Here Johnson grass, Dallis grass, carpet grass, lespedeza, hop clover, black medic, and white clover grow well on the relatively heavy textured soils, which are more difficult to till than the sandy soils.

Swine are raised almost entirely for home use. Small surpluses of pork are often sold locally.

Mules are the chief work animals on farms, and a smaller number of horses are used for this purpose. A few oxen are used for farm work.

Table 3 gives the number and value of livestock in 1930 and 1940.

TABLE 3.—*Number and value of livestock in Macon County, Ala., in 1930 and 1940*

Livestock	1930 [1]		1940 [2]	
	Number	Value	Number	Value
Horses	795	$49,930	685	$62,710
Mules	4,307	417,424	3,700	498,980
Cattle	11,430	375,864	15,794	399,083
Sheep	233	974	41	156
Goats	201	442	----------	433
Swine	15,379	126,465	11,370	68,592
Chickens	62,428	46,197	71,104	35,552
Bees (hives)	644	1,707	504	655

[1] Livestock of all ages on April 1, 1930, excluding chickens under 3 months of age

[2] Livestock on April 1, 1940, excluding horses, mules, and cattle under 3 months of age, pigs and chickens under 4 months, and sheep under 6 months Comparable data in 1930 were 733 horses, 4,287 mules, 9,626 cattle, and 157 sheep. Swine and chickens over 4 months were not reported in 1930, but the numbers over 3 months were 10,584 and 62,428, respectively.

Chickens are kept on nearly every farm, primarily in order to supply the home with eggs and meat and to provide a small surplus for sale. A few farmers specialize in poultry raising. In 1939, 2,750 farms reported a production of 416,388 dozen eggs and 2,702 farms reported 142,760 chickens raised. Turkeys, numbering 2,005, were raised on 197 farms. A few geese and ducks are raised.

Table 4, compiled from the United States census for 1940, gives the value of certain agricultural products in 1939 by classes.

TABLE 4.—*Value of agricultural products by classes in Macon County, Ala., in 1939*

Crop	Value	Livestock products	Value
Cereals	$399,980	Dairy products sold	$44,188
Other grains and seeds	106,921	Poultry and eggs produced	149,535
Hay and forage	63,630	Honey produced	303
Vegetables (including potatoes and sweetpotatoes)	86,701		
Fruits and nuts	33,628		
All other field crops (mostly cotton)	915,907		
Farm garden vegetables, excluding potatoes and sweetpotatoes, for home use only	109,230		
Forest products sold	15,817		

According to the 1940 census, $210,555 was spent for fertilizers in 1939 on 2,864 farms, or an average of $73.52 per farm reporting. Much of the fertilizer is purchased ready mixed and is used largely for cotton.

Farm labor is generally plentiful enough to meet current needs. Practically all of the farm laborers are Negroes. The smaller farm units are worked almost entirely by the operator and members of his family. In 1939, 1,011 farms paid $212,128 in wages, or an average of $209.82 a farm.

In 1940, land in farms amounted to 260,436 acres, or 66.1 percent of the area of the county. Of this, 153,377 acres, or 38.9 percent of the land in the county, were improved, that is, were in cropland or plowable pasture. There were 3,374 farms, averaging 77.2 acres in size. Full owners operated 651 farms, part owners 197 farms, managers 7 farms, and tenants 2,519 farms. Farms are somewhat smaller than in 1880, when 2,187 farms, averaging 141 acres in size, included 308,745 acres, of which 136,450 acres were improved. Tenancy increased from 72.9 percent in 1880 to 74.7 percent in 1940.

Tenant-operated land is rented largely on a share basis, under two types of terms. Under one, the owner, in addition to furnishing the land, provides the work animals and tools and receives one-half of the crops. Under the second, the tenant furnishes the work animals and tools and the owner receives a third of the corn and a fourth of the cotton. Cash rentals normally range from $3 to $5 an acre for land actually farmed. These systems vary to a certain extent with different farm managements.

Most of the owner-operated farms have an adequate number of substantial, well-built dwellings and outbuildings. This is especially true on the better lands where diversified farming is followed. In the older settled localities are some two-story residences. Most of the tenant houses are small and cheaply constructed. The barns are generally sufficient for the storage of feed; and shelters, sheds, or barns are provided for the care of livestock on some of the better kept farms. Many of the owner-operated farms are well equipped with labor-saving implements, such as two-horse plows, cotton and corn planters, intertillage cultivators, grain drills, mowing machines, and

grain binders. A few tractors are in use. Most of the farm implements used by tenant farmers are of the light-weight one-horse type.

In 1940, land and buildings were valued at $1,493 a farm and $19.34 an acre. Comparable values in 1930 were $1,579 and $27.02. In 1940 the value of all farm property, including implements and domestic animals, was $1,926 a farm, of which 53.4 percent was invested in land, 24.1 percent in buildings, 6.1 percent in implements, and 16.4 percent in domestic animals. Actual sale values of farm land vary with the nearness or remoteness of improved highways and types of soil. Rolling or broken land that is not well suited for cultivation is valued according to its usefulness as pasture or timberland.

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 are determined by simple tests. 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 is studied.

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

The most important group is the series, which includes soils having the same genetic horizons, similar in their important characteristics and arrangement in the soil profile, and developed from one 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 differ within a series. The soil series are given names of places or geographic features near which they were first found. Norfolk, Ruston, Susquehanna, and Amite are names of important soil series in this county.

[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.

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

A phase of a soil type is recognized for the separation of soils within a type that differ from the type in some minor soil characteristic that may, nevertheless, have an important practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. For example, within the normal range of relief for a soil type, some areas may be adapted to the use of machinery and the growth of cultivated crops, and others may not. Even though there may be no important difference in the soil itself or in its capability for the growth of native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated crops. In such an instance the more shallow or eroded parts of the soil type may be segregated on the map as a shallow or eroded phase. These differences may not be 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 Macon County include a large number of distinct soil types and many phases, which indicate significant differences in physical condition and chemical composition. There are some large areas of comparatively uniform soil in different parts of the county, but in general the individual types or phases occur in small bodies and in rather complex associations. In some places the soils grade from one to the other; in others they are separated from each other by abrupt changes in texture, color, and other soil characteristics within short horizontal distances.

The color, texture, structure, organic-matter content, acidity, and drainage conditions of the soils in the sandy uplands and on the river terraces differ markedly from those features of the prairie and associated heavy clay soils. These differences are due in large measure to the underlying material from which the soils have developed and also to the aeration, oxidation, erosion, and leaching that have taken place during their formation. These important factors used in the classification of the soils influence their fertility, responsiveness to management, and productivity under cultivation. Sheet erosion has removed in many places a large part of the original

layer of surface soil, thereby changing its land use and responsiveness to management.

Organic matter is deficient in all the soils except some of those of the prairie and some of those on the first bottoms and second bottoms and terraces. All the sandy soils of the uplands are leached of both organic and mineral plant nutrients in the surface soil.

Fairly level areas of good agricultural soils occur in the northern part of the county and to a greater or less extent in the eastern, southern, and central parts. About 22 percent of the area of the county is first-bottom land and comprises several soil types that have poor natural drainage and are subject to frequent overflow. These soils have a potential value for pasture grasses and also for farm crops if adequately drained. About 24 percent of the county is included in slope, eroded, and hilly phases of soils. All these areas and some of the sandy and extremely poorly drained areas in the bottoms should remain in forest or be reforested.

The soils of the sandy uplands have developed from the weathered products of beds of unconsolidated fine sand, sand, and clay. They include the Norfolk, Ruston, and Gilead soils, which are widely distributed over the northern, eastern, and central parts of the county. The Faceville, Orangeburg, and Red Bay soils are developed on Tuskegee Ridge near Tuskegee and Shorter. These are the reddest soils of the uplands. They are underlain in many places at a depth of 4 to 10 feet by loamy sand, sand, or gravel, which allows excellent drainage and aeration. The Cuthbert soils in the northern and eastern parts differ from the other soils of the sandy uplands in that they have heavier textured subsoils. In many places the Gilead and Cuthbert soils are closely associated in the eastern and northern parts, and in some places the Cuthbert and Susquehanna soils are closely associated.

The only areas of Cecil and Chesterfield soils are in the extreme northern part. The Cecil soils belong in the Piedmont Plateau and have developed from the weathered products of granite and gneiss. The Chesterfield soils represent a condition in which a shallow covering of loose sandy Coastal Plain material overlies heavy clay that has been derived from the weathered products of the rocks beneath.

Most of the larger streams are bordered by broad areas of soils of the first bottoms and in some places by comparatively large areas of soils of the second bottoms and terraces. The Tallapoosa River brought down soil materials from the Piedmont Plateau part of the State and deposited them when the river flowed at higher elevations. These materials have given rise to the Wickham and Altavista soils. In the present flood plain of the Tallapoosa River are areas of Congaree soils. Streams rising in and flowing through the Coastal Plain are bordered by fairly wide and rather continuous areas of the Kalmia, Leaf, and Flint soils, by smaller areas of Cahaba soils on second bottoms or terraces, and, in places, by large areas of soils on the first bottoms. Kaufman clay has developed from material washed mainly from calcareous clay and acid clay. The Bibb and Iuka soils, and alluvial soils, undifferentiated, come from materials more recently washed from the acid soils of the uplands.

The Houston, Sumter, and Bell soils, typical soils of the prairie, occur in the southern part of the county. They are developed from beds of soft white chalk, or so-called rotten limestone. They are the only calcareous soils in the county. Extensive areas of these soils of the Black Belt occur in the counties to the west. Associated with these soils of the prairie are areas of heavy clay soils, apparently formed from beds of heavy clay that are strongly acid in reaction. This clay is underlain by calcareous material at a varying depth, generally from 2 to more than 4 feet. The heavy clay soils are members of the Oktibbeha, Vaiden, and Eutaw series. Large areas of the Susquehanna soils, also developed from beds of heavy clay, are in the southern and southwestern parts of the county.

In many places a clear relationship exists between the characteristics of the soils and the agriculture practiced on them. This will be dealt with under the descriptions of the individual soils in subsequent pages. Although many of the soils are low in organic matter and mineral plant nutrients, their physical properties are so favorable that they readily respond to the addition of commercial fertilizer and manure. A large part of these sandy soils that have a favorable relief is devoted to the production of cotton. Both the soils and the climate favor this crop. Cotton on these soils matures early, and a fair crop is made before the boll weevil does much damage. The production of cotton meets the need of a cash crop, and it has always been the only crop on which the landowners and tenants can obtain credit and security for rent, supplies, and fertilizer.

The large number of different soils in Macon County, according to the physical characteristics and chemical composition that influence their responsiveness to management, crop adaptation, land use, and tillage operations, have been placed in ten general groups as follows: (1) Soils with sandy surface soils and yellow or red friable sandy clay subsoils; (2) soils with brown surface soils and friable subsoils on first or second bottoms; (3) soils with sandy surface soils and yellow or reddish-brown compact subsoils; (4) soils with sandy surface soils and mottled heavy plastic clay subsoils; (5) calcareous heavy clay soils; (6) soils with heavy clay surface soils and mottled heavy plastic clay subsoils; (7) sands, fine sands, and loamy sands; (8) soils with shallow sandy surface soils and yellow or reddish-brown compact subsoils; (9) poorly drained soils of the first and second bottoms; and (10) soils of eroded and sloping areas and steep hilly land.

Each of the groups includes soils that vary widely in certain characteristics; in the main, however, they have somewhat similar structure, friability, compaction, and other features. There are chemical differences in the soils of each group, but these differences may be overcome for the production of general farm crops by adding commercial fertilizers or by turning under leguminous crops. This, of course, is not true for the highly specialized crops, such as alfalfa and tobacco.

In the following pages the soil groups are discussed, the soils are described in detail, and their agricultural relationships are discussed; their location and distribution are shown on the accompanying soil map, and their acreage and proportionate extent are given in table 5.

TABLE 5.—*Acreage and proportionate extent of the soils mapped in Macon County, Ala.*

Type of soil	Acres	Per-cent	Type of soil	Acres	Per-cent
Norfolk sandy loam	18,880	4.8	Norfolk loamy sand, slope phase	1,664	0 4
Norfolk fine sandy loam	4,096	1.0	Norfolk fine sand	5,696	1 4
Ruston fine sandy loam	2,816	.7	Norfolk sand	7,232	1 8
Ruston fine sandy loam, slope phase	448	.1	Norfolk sand, slope phase	10,880	2 8
Sawyer fine sandy loam	2,816	7	Cahaba loamy sand	256	.1
Faceville fine sandy loam	832	.2	Kalmia loamy fine sand	1,280	.3
Orangeburg fine sandy loam	1,664	.4	Kalmia sand	1,792	5
Red Bay fine sandy loam	640	.2	Gilead sandy loam, eroded phase	6,144	1 6
Kalmia sandy loam	2,304	6	Chesterfield sandy loam	1,856	5
Kalmia fine sandy loam	2,560	.7	Cuthbert sandy loam, eroded phase	12,608	3.2
Cahaba fine sandy loam	704	.2	Altavista fine sandy loam	960	2
Izagora fine sandy loam	6,400	1.6	Wickham fine sandy loam, thin surface soil phase	1,792	.5
Amite fine sandy loam	960	2	Flint fine sandy loam, eroded phase	768	.2
Congaree silt loam	2,944	7	Roanoke silt loam	1,536	4
Congaree loamy fine sand	1,792	.5	Myatt fine sandy loam	11,328	2 9
Ochlockonee silt loam	1,792	5	Iuka silt loam	768	.2
Wickham silt loam	1,664	4	Kaufman clay	10,432	2 7
Augusta silt loam	4,224	1 1	Bibb silt loam	22,464	5.7
Jamison fine sandy loam	256	1	Bibb fine sandy loam	8,128	2.1
Gilead sandy loam	5,760	1 5	Alluvial soils, undifferentiated	38,912	9.9
Gilead sandy loam, slope phase	2,048	5	Swamp	704	2
Shubuta sandy loam	1,920	5	Riverwash	256	1
Luverne fine sandy loam	2,432	.6	Gilead sandy loam, eroded slope phase	17,280	4 4
Flint sandy loam	1,408	.4	Chesterfield sandy loam, eroded slope phase	3,328	.8
Flint sandy loam, deep phase	1,728	.4	Cuthbert sandy loam, eroded slope phase	13,952	3.6
Flint fine sandy loam	768	.2	Gilead-Cuthbert sandy loams, eroded slope phases	14,144	3.6
Wickham fine sandy loam	2,048	.5	Susquehanna clay, slope phase	25,408	6 5
Macon very fine sandy loam	960	.2	Oktibbeha clay, slope phase	1,728	.4
Susquehanna very fine sandy loam	17,472	4 4	Cecil sandy loam, eroded hilly phase	192	(1)
Vaiden very fine sandy loam	8,384	2.1	Vaiden-Susquehanna clays	4,864	1.2
Oktibbeha fine sandy loam	832	.2	Vaiden-Susquehanna clays, steep phases	5,888	1 5
Leaf sandy loam	1,536	.4	Steep hilly land (Gilead and Cuthbert soil materials)	384	1
Leaf fine sandy loam	8,704	2 2			
Houston clay, shallow phase	2,688	.7	Total	392,960	100 0
Sumter clay	1,856	5			
Bell clay	1,792	.5			
Susquehanna clay	13,632	3.5			
Oktibbeha clay	4,864	1 2			
Vaiden clay	5,888	1.5			
Eutaw clay	4,032	1 0			
Norfolk loamy sand	9,792	2.5			

[1] Less than 0 1 percent.

SOILS WITH SANDY SURFACE SOILS AND YELLOW OR RED FRIABLE SANDY CLAY SUBSOILS

Soils with sandy surface soils and yellow or red friable sandy clay subsoils comprise 11.4 percent of the total area of the county. They produce probably 50 percent of the general farm crops. They are considered the most desirable soils for diversified farming, because they have favorable relief, good drainage, friable mellow sandy surface soils, and friable sandy clay subsoils. They warm early in the spring and respond readily to management. Another desirable feature is that they are easily tilled.

This group includes Norfolk sandy loam; Norfolk fine sandy loam; Ruston fine sandy loam; Ruston fine sandy loam, slope phase; Sawyer fine sandy loam; Faceville fine sandy loam; Orangeburg fine sandy loam; Red Bay fine sandy loam; Kalmia sandy loam; Kalmia fine sandy loam; Cahaba fine sandy loam; Izagora fine sandy loam; and Amite fine sandy loam.

The Norfolk and Ruston soils have gray or grayish-yellow surface soils, respectively, and yellow or yellowish-brown friable fine sandy clay subsoils. The Sawyer soils have the surface appearance of the Norfolk, whereas the lower part of the subsoil has all the character-

istics of the corresponding layer in the Susquehanna. The Faceville, Orangeburg, and Red Bay soils comprise the soils of the uplands that have brown or red surface soils and subsoils. Kalmia sandy loam and Kalmia fine sandy loam of the second bottoms or terraces are similar in color characteristics to the Norfolk soils of the uplands. The Cahaba soils, also of the second bottoms, resemble the Ruston soils of the uplands. The Amite soils of the terraces closely resemble the Red Bay soils of the uplands.

All the soils in this group occur on dominantly smooth land where the slope in few places exceeds 4 percent, except in bodies of Ruston fine sandy loam, slope phase. They occupy the smooth, broad interstream areas, flatter hilltops, narrow winding ridges of the uplands, and practically level benchlike positions or second bottoms. These soils lend themselves admirably to the use of both light implements and heavy farm machinery. Natural drainage is everywhere good. Erosion is not a serious problem, but the more sloping areas would be benefited by broad terraces, which would control the runoff of rain water, particularly on the longer slopes. Growing winter cover crops in order to control erosion and improve the soil is strongly recommended. These soils are easily tilled. They warm early in the spring and are some of the first soils in the county on which agricultural operations are begun. The subsoils are sufficiently heavy in texture to retain moisture, fertilizers, or barnyard manure. The fine sandy clay subsoils are favorable for the movement of soil water. The soils of this group are capable of being built up to a high state of productivity by turning under leguminous crops and by adding barnyard manure. Their productive power can be maintained and improved by suitable applications of commercial fertilizer. The soils have a wide crop adaptation. More detailed information on crops and fertilizers for these soils is given in the section on Land Uses and Agricultural Methods.

Norfolk sandy loam.—Norfolk sandy loam is one of the most important soils in the county. It comprises a large part of the plateau ridges in the vicinity of and west and southwest of Notasulga, the broad fields in the vicinity and south of Little Texas, and other areas. It is recognized as a sandy soil of the uplands having a gray surface soil and yellow friable subsoil.

The typical profile characteristics are as follows:

0 to 7 inches, gray friable loamy sand.
7 to 12 inches, yellow light-textured mellow sandy loam.
12 to 18 inches, yellow friable sandy clay or heavy sandy loam.
18 to 32 inches, yellow friable sandy clay that is uniform in color.
32 to 48 inches, light brownish-yellow friable sandy clay containing streaks and lenses or lumps of compact, hard, gritty clay material in lower positions.
48 inches+, streaks and strain of yellow loamy sand and gray clay.

Included with this soil are a few small areas of Norfolk gravelly sandy loam. Gravel symbols are shown on the map on the principal gravelly areas—those near Little Texas, McCrey Chapel, Notasulga, Salem Church, Mount Sheba Church, Simmons School, and Brownville No. 2 School, and north of Youngblood Store. In few places is the gravel an obstacle to tillage; in fact in many places it is slightly beneficial, as it allows the soil to drain even better and to warm even earlier in the spring than does typical Norfolk sandy loam.

A second inclusion comprises a few small areas of Gilead sandy loam that are too small to separate on a map of the scale used. The Gilead soil occurs on small knobs and knolls and has a heavier clay or a compact sandy clay subsoil, between depths of 12 and 18 inches, than does the Norfolk soil. For the production of cotton Gilead sandy loam compares favorably with the Norfolk, but for the production of corn it is slightly inferior, as it tends to be a little droughty.

A third important inclusion represents several small areas of Norfolk sandy loam, deep phase, which are closely associated with typical Norfolk sandy loam. This deep soil differs essentially from the typical soil in that yellow friable sandy clay generally lies from 16 to 24 inches below the surface. This soil may be considered intermediate in crop production between Norfolk sandy loam and Norfolk loamy sand. It is not quite so responsive to fertilization and not quite so easily maintained in a state of productivity as Norfolk sandy loam, but it is better in these respects than Norfolk loamy sand. It occupies favorable relief, having a slope that in few places exceeds 4 percent, and it is naturally well drained. It warms early in the spring; is well suited to early-season crops, such as peanuts and bright tobacco; and it can be used satisfactorily for general farm crops.

A fairly large area of Norfolk sandy loam is mapped. The principal bodies are in the northwestern part of the county near Notasulga, McCrey Chapel, Golddust School, Vaughan Mill, Salem Church, and Bethlehem Church. Other large areas are near Little Texas, Brownville No. 1 School, Simmons School, Society Hill, Devine Church, Greenwood, Antioch Church, Armstrong Church, and Milstead.

Norfolk sandy loam has a very favorable relief. Most of it has a slope of less than 2 or 3 percent, although a few areas of included soil have a slope of as much as 5 or 6 percent. Because of the favorable surface relief, porosity, and water-absorbing capacity of this soil, it is not subject to serious erosion. A large part of the land, however, should be and is terraced.

Norfolk sandy loam is held in comparatively small farm units and the owners closely supervise the management of the farms. The farm family often does practically all of the farm labor. This soil lends itself to a high type of farming and supports excellent communities. This is due to the suitability of the soil for diversified crops and to healthful surroundings.

Practically all of this soil is in cultivation year after year. It is well adapted to all locally grown crops other than those requiring a high lime content. Any crop rotation suitable to the locality may be used. In general, farm management is very good on this soil, and acre yields of 25 to 45 bushels of corn and ¾ to 1 bale or more of cotton are obtained. Other crops return proportionately good yields. About 60 percent of the land is used for the production of cotton; the rest is devoted mainly to corn, oats, and hay crops. Most of the farmers use cover crops preceded by liberal applications of phosphate or basic slag or complete fertilizer in order to obtain larger yields.

Norfolk fine sandy loam.—Norfolk fine sandy loam is similar to Norfolk sandy loam, differing from it principally in having a finer texture and in occurring in the southern part of the county rather than in the northern part.

This soil has the following profile characteristics:

0 to 6 inches, gray fine sandy loam or loamy fine sand.
6 to 12 inches, yellow friable fine sandy loam.
12 to 30 inches, yellow friable fine sandy clay that is uniformly colored.
30 inches+, yellow heavy fine sandy clay containing some gray and brown mottlings, the gray material being somewhat sticky and plastic.

In the vicinity of Society Hill an area of approximately 160 acres of Marlboro fine sandy loam is included with this classification. This soil differs from the Norfolk in that it has only a 5- or 6-inch surface soil and a heavier textured but friable fine sandy clay subsoil. This soil is possibly superior to Norfolk fine sandy loam for the production of general farm crops, but possibly it is not so satisfactory for the production of tobacco.

Another inclusion comprises small areas of Norfolk fine sandy loam, deep phase, which occur south of Tysonville, Calebee Church, St. Paul Church, and Warriorstand. This deeper soil is similar to Norfolk fine sandy loam except that it has a thicker covering of light-textured fine sandy material over the yellow fine sandy clay. Generally the fine sandy clay lies from 18 to 24 inches below the surface. The surface is almost level to very gently sloping, and natural surface drainage is well established. The soil warms early in the spring and responds to good management. It is one of the best soils in the county for the production of bright tobacco. Peanuts and early-maturing crops do well on this soil. For general farm crops it is slightly less productive under similar fertilization and cultural treatments than Norfolk fine sandy loam. Under good management the yields may equal or exceed those obtained on the typical soil under ordinary management.

In a few locations, particularly in the vicinity of Shorter, the material at a depth of 30 inches is heavy and sticky, even though the soil is normally developed above this layer. In places where Norfolk fine sandy loam joins Susquehanna fine sandy loam, a heavy clay is present at a depth of 24 to 26 inches. These underlying clays have no apparent influence on the production of crops.

Norfolk fine sandy loam is not an extensive soil. The principal areas are near St. Paul Church, Shorter, and Solomon School, and northwest of Nebraska Church. Small areas, comprising less than 100 acres each, are scattered over the county, principally in the southern part. This soil occupies very favorable relief, the slope in few places exceeding 3 percent. It is not seriously affected by erosion, as it absorbs rainfall readily; however, most of it should be and is terraced.

All the land is cultivated and used for general farm crops year after year. From 60 to 75 percent is used for the production of cotton, which normally yields ½ to 1 bale an acre. Corn, oats, and hay crops, grown on the rest of the land, also produce satisfactory yields. It lends itself to diversified agriculture and responds very well to management. Any crop rotation system desired by the farmer, that excludes the lime-loving crops, alfalfa and black medic, should be satisfactory on this soil. Under good management excellent crop yields are about the same as those obtained on Norfolk sandy loam. On the Breton experiment field this soil produced 32.1 bushels of corn and 1,224 pounds of seed cotton to the acre on the

414558—44——2

most economically fertilized plots. Crops on Norfolk fine sandy loam are able to withstand droughts exceptionally well and are surpassed in this respect only by crops on the overflow bottoms and on Jamison fine sandy loam.

Ruston fine sandy loam.—Ruston fine sandy loam is very closely related to the Norfolk, Orangeburg, and Red Bay soils in structural characteristics but differs from them in color. In the latter respect it is intermediate between the Norfolk and Orangeburg soils, having a darker colored subsoil than the former and a lighter colored subsoil than the latter.

Ruston fine sandy loam has the following profile characteristics:

0 to 7 inches, brownish-gray loamy fine sand.
7 to 10 inches, grayish-yellow light fine sandy loam.
10 to 15 inches, yellowish-brown or brownish-yellow friable fine sandy loam or light friable sandy clay.
15 to 36 inches, yellowish-brown or reddish-brown friable fine sandy clay.
36 to 45 inches, yellowish-brown or rusty-brown fine sandy clay containing some splotches or streaks of red, yellow, and gray. This layer is fairly friable and brittle when moist.
45 inches+, yellow compact and stratified loamy sand and gray heavy clay that is firmly bedded.

Occurring in close association with areas of Ruston fine sandy loam and included with them on the soil map, in the vicinity of Tysonville and Milstead, are small areas of Ruston fine sandy loam, deep phase. This included soil is gently sloping and naturally well drained. It is all cleared and used for general farm crops. Most of it is devoted to the production of cotton, and the yields under good management and fertilization range from one-half to three-fourths of a bale to the acre. Winter legumes are very beneficial in building up and maintaining the productivity of this soil. The productivity of this deep soil, however, is not quite so easy to maintain as that of Ruston fine sandy loam, but under good management the soil is very satisfactory. It differs from Ruston fine sandy loam mainly in that the yellowish-brown or brown fine sandy clay lies from 12 to 26 inches below the surface.

Some small spots of Norfolk fine sandy loam, Orangeburg fine sandy loam, and Ruston gravelly fine sandy loam are also included.

Ruston fine sandy loam is not an extensive soil. The principal areas are near Little Texas, Vaughan Mill, Salem Church, Calebee Church, St. Paul Church, and 1 mile south of Pleasant Hill School. Those areas in the northern and northeastern parts of the county have a somewhat coarser textured surface soil, approximating sandy loam. Few areas have a slope exceeding 4 percent. This soil is well managed, and practically all of it is terraced, even though it is not so subject to erosion as many other soils that are being farmed.

All the land is cleared and devoted to general farm crops. Like the closely related Norfolk fine sandy loam, this soil is well suited to diversified farming and produces large yields of crops under good management. Any cropping system suited to the locality may be used on it with excellent results, except that it is not adapted to lime-loving crops. Winter legumes are very beneficial in building up and maintaining the fertility of the soil. Response to management, productivity, crop adaptation, land use, and fertilizer require-

ments, according to experimental results, are about the same as for Norfolk fine sandy loam.

Ruston fine sandy loam, slope phase.—Ruston fine sandy loam, slope phase, differs from Ruston fine sandy loam principally in that it has a steeper slope—from 5 to 10 percent.

It has the following profile characteristics:

0 to 10 inches, brownish-gray loamy fine sand.
10 to 28 inches, light yellowish-brown or brownish-yellow loamy fine sand.
28 to 36 inches, brown friable heavy fine sandy loam or fine sandy clay.
36 inches+, same material as above, except that it contains a little more clay and is fine sandy clay in texture. Mottlings of gray and yellow generally appear at a depth of 40 to 50 inches.

The sandy character of this soil allows it to drain readily, and it may be tilled shortly after rains. The relief favors excessive surface drainage, and to forestall destructive erosion well-constructed terraces are necessary. Suitable terraces can be easily maintained.

Only a small total area is mapped, chiefly south of Tysonville and near St. Paul Church, Calebee Church, and Shorter.

Practically all of the land is in cultivation each year. It is well suited to general farm crops, and fair to good yields may be expected. Probably 70 percent of it is used for the production of cotton; the rest is used for corn, oats, and hay crops. Yields of cotton normally range from one-third to two-thirds of a bale to the acre under current management. Corn, oats, and other general farm crops yield proportionately well under good management.

Sawyer fine sandy loam.—As mapped in Macon County, Sawyer fine sandy loam is a transitional soil between Norfolk fine sandy loam and Susquehanna fine sandy loam. The surface soil and the upper part of the subsoil are similar to those layers of Norfolk fine sandy loam, whereas the lower part of the subsoil is similar to that of Susquehanna fine sandy loam.

The profile characteristics are as follows:

0 to 5 inches, gray loamy fine sand to fine sandy loam.
5 to 7 inches, grayish-yellow friable fine sandy loam.
7 to 15 inches, yellow friable fine sandy clay that is somewhat sticky under extremely moist or wet conditions.
15 to 20 inches, yellow firm and slightly sticky fine sandy clay containing some brown and gray streaks and mottles.
20 to 36 inches, mottled and marbled yellow, gray, and reddish-brown clay that is sticky and plastic. In many places this layer is rather compact. The gray mottlings increase with depth.

The total area of this soil is not large. Bodies occur chiefly near St. Mark Church, in the vicinity of Tuskegee, and near Macedonia Church, Mount Andrew Church, Danners Chapel, Renfro Church, and Brown School. In most locations this soil lies in slightly higher or lower positions than the Susquehanna soils with which it is closely associated. Most of the soil occurs as small meandering bodies on the ridges and secondary elevations where sheet erosion has not been very active. Where erosion has been active, however, this soil has lost its original surface characteristics and has become more nearly Susquehanna clay loam or shallow very fine sandy loam. Although the relief generally is very favorable, terraces should be constructed on the more sloping areas, as erosion seriously impairs the response of this soil to management.

An area of approximately 40 acres of Sawyer fine sandy loam, deep phase, 1 mile southeast of La Place Church, is included. The sandy clay continues downward to a depth of 18 to 24 inches. Increased depth to the sandy clay in this soil improves the productivity, as the deeper soil warms earlier in the spring and can be cultivated under a wider range of moisture conditions than the typical soil.

Sawyer fine sandy loam is well suited to general farm crops. Probably 80 percent is used for the production of cotton, which normally yields one-third to two-thirds of a bale an acre under current management. Large yields of oats, cowpeas, soybeans, and winter cover crops are obtained under good management. Acre yields of corn normally range from 12 to 25 bushels, although they should be higher when corn follows cotton on land that has been fertilized with 150 to 225 pounds of nitrate of soda to the acre.

Faceville fine sandy loam.—Faceville fine sandy loam is very closely associated with Orangeburg fine sandy loam. It is similar in color to Ruston fine sandy loam, but it has a much heavier textured subsoil.

The following profile characteristics are typical:

0 to 6 inches, gray or brownish-gray fine sandy loam.
6 to 20 inches, brownish-yellow to yellowish-brown friable fine sandy clay that is slightly sticky when wet. This layer is heavier textured than the comparable layer in Ruston fine sandy loam.
20 to 30 inches, brownish-red to yellowish-brown heavy fine sandy clay that is somewhat compact in place but fairly friable when removed. When wet it becomes somewhat sticky.
30 inches +, red compact fine sandy clay. This layer contains some yellow and gray splotches and mottlings, and, like the one above, it is somewhat sticky when wet.

A few areas resembling Marlboro fine sandy loam are included with this soil. In these areas the yellow subsoil extends to a depth of 36 or more inches.

The principal areas of Faceville fine sandy loam are on the Tuskegee Ridge and near Shorter, in association with Orangeburg fine sandy loam.

Faceville fine sandy loam has an almost level surface, the slope in few places exceeding 2 percent. It is a valuable agricultural soil but limited in area.

This soil is very responsive to management and is well suited to most general farm crops when it is properly managed and liberal applications of fertilizer or legumes are used. The principal crops are cotton, oats, winter cover crops, and cowpeas; and some corn is grown. For the production of cotton, oats, and winter cover crops this soil probably is not excelled by any soil in the county. Other locally grown crops also do well. Under good management, acre yields of cotton range from ½ to 1 bale, oats from 30 to 40 bushels, corn 25 to 35 bushels, and cowpeas 1 to 2 tons.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam is recognized as a soil of the uplands having a brownish-gray surface soil, a brown upper subsoil layer, and a bright-red lower subsoil layer. It is associated with the Norfolk, Ruston, and Red Bay soils.

It has the following profile characteristics:

0 to 6 inches, brownish-gray fine sandy loam containing some organic matter.
6 to 15 inches, reddish-brown or brown fine sandy clay that is fairly friable but shows some adhesion and cohesion when wet.
15 to 50 inches, bright-red or brownish-red heavy fine sandy clay. This material is fairly friable under favorable moisture conditions, but when wet is sticky.
50 inches +, red, yellow, and gray stratified fine sandy clay, sand, and clay.

In places the third layer extends to a depth of 6 to 8 feet.

As mapped in the vicinity of Tuskegee, Orangeburg fine sandy loam resembles Magnolia fine sandy loam, which occurs elsewhere in the State. Here the soil has a much heavier and redder upper subsoil layer than typical Orangeburg fine sandy loam. Under similar farm management yields of most crops, particularly cotton and oats, on Magnolia fine sandy loam are expected to equal or exceed those on Orangeburg fine sandy loam.

Practically level fields of Orangeburg fine sandy loam are near Tuskegee, Calebee Church, and Devine Church. The total area is small.

All this soil is cleared and tilled to general farm crops. As it has a sandy surface soil and a friable upper subsoil layer, it is easy to till, absorbs and gives up moisture readily to growing plants, and responds favorably to good farm practices. Probably 75 percent of the land is used for the production of cotton; the rest is used for oats, corn, and hay crops. When the land is liberally fertilized, cotton yields from ½ to 1 bale and corn 25 to 35 bushels an acre under good management. On an experiment field on Orangeburg fine sandy loam at Monroeville, Ala., the acre yield of cotton over a 4-year period averaged 1,060 pounds of seed cotton when the land was fertilized with 600 pounds of a 6–8–4 [5] fertilizer to the acre. On this same plot corn yielded 31 bushels when it followed cotton on land that received a large application of mixed fertilizers the preceding year and when the cornland was side-dressed with 225 pounds of nitrate of soda to the acre. All other locally grown crops are well suited to this soil.

Red Bay fine sandy loam.—Red Bay fine sandy loam is recognized as the red soil of the uplands. Practically all of it occurs northwest of Shorter and east of Shorters Station. It is similar to Amite fine sandy loam, which occurs on the second bottoms or terraces. Red Bay fine sandy loam occupies ridges and plateaulike positions surrounded by steep slopes, many of which have numerous deep gullies that are constantly cutting into the productive fields.

This soil has the following profile characteristics:

0 to 6 inches, dark-brown or reddish-brown friable fine sandy loam containing enough organic matter to give it a dark appearance when wet.
6 to 8 inches, dark brownish-red fine sandy clay that is fairly friable but contains enough fine material to make it somewhat sticky when wet. This layer is a transition between the surface soil and the subsoil.
8 to 45 inches, brownish-red or red friable fine sandy clay. When rubbed this material takes on a high polish because it contains a large proportion of fine material. This fine material also makes the clay sticky when wet.
45 inches +, sand or loamy sand and water-worn gravel. This underlying material has been removed in a few locations for road-building purposes.

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

In places the subsoil reaches a depth of 5 to 7 feet.

A few small areas of Blakely loam occupying slight depressions are included in mapping. This included soil is much darker in the surface soil and upper subsoil layers than Red Bay fine sandy loam. Also, it is much better suited to the production of corn and hay crops than the Red Bay soils. Another inclusion, which occupies a few areas, generally between Blakely loam and Red Bay fine sandy loam, is Red Bay loam. This variation does not contain so much sand in the surface soil as Red Bay fine sandy loam. It has the same land use, however, as the latter soil.

Only a small total area of Red Bay fine sandy loam is mapped. Small areas are near the Lee County line in the northeastern part of the county. The surface is practically level; nevertheless terraces are needed in many places that are very helpful in conserving the surface soil. Erosion is active in only a few areas; in other areas the soil is being built up as the result of accumulation from adjacent higher lying soils.

Red Bay fine sandy loam is considered one of the best soils in the county for the production of cotton, oats, and winter cover crops, and it is satisfactory for other crops. Legumes do especially well. Possibly alfalfa would do well if a large quantity of basic slag were applied. This soil is used almost entirely for growing cotton, oats, and cowpeas. It is generally considered slightly droughty for corn. On the Prattville experiment field of the Alabama Agricultural Experiment Station, however, this soil has returned good yields of various crops. On the experiment field the acre yield for a 5-year average was 1,117 pounds of seed cotton when the land was fertilized with 600 pounds of 6-8-4 fertilizer to the acre. When corn was rotated with cotton and given a side dressing of 225 pounds of nitrate of soda, it yielded an average of 34 bushels an acre over a 6-year period. Other crops, including oats, soybeans, cowpeas, lespedeza, kudzu, and truck crops, do proportionately well. The use of winter cover crops or summer legumes is very beneficial to this soil, and the most economical yields are generally obtained by turning under vetch, Austrian Winter peas, or crimson clover.

Kalmia sandy loam.—Kalmia sandy loam, which occurs on second bottoms or terraces, is similar in profile characteristics to Norfolk sandy loam of the uplands.

It has the following profile characteristics:

0 to 5 inches, gray loamy sand.
5 to 13 inches, yellow friable light-textured sandy loam.
13 to 24 inches, light brownish-yellow to yellow friable sandy clay.
24 to 30 inches, yellow slightly compact but friable sandy clay.

Mottlings of gray and brown are present at a depth of 30 to 36 inches.

This is not an extensive soil. The principal areas are near Milstead, Chehaw, Concord Church, Bethel Grove Church, and Simmons School and southeast of Tuskegee.

About 90 acres of Kalmia sandy loam, deep phase, 1 mile southwest of Cubahatchee Church and about 45 acres southeast of St. Paul Church are included. In these areas the depth to the underlying sandy clay is 20 to 28 inches. This inclusion is almost as responsive to management as the typical soil. A second inclusion comprises

about 29 acres of Kalmia gravelly sandy loam in the vicinity of Simmons School. The gravel interferes to a marked degree with cultivation, but yields are comparable to those on the normal soil.

Several small areas of Kalmia sandy loam are imperfectly drained. These areas are intermediate in drainage and profile development between Kalmia sandy loam and Myatt sandy loam. They are level, occupying a slightly lower position than areas of typical Kalmia sandy loam. The subsoil is grayish-yellow friable sandy clay mottled with gray and rust brown, particularly in the lower part, and below a depth of 24 to 30 inches the gray color is more pronounced and the material is slightly compact. This variation is closely associated with typical Kalmia sandy loam. In ordinary dry seasons it is better suited to the production of corn and sorgo than the typical sandy loam because of more favorable moisture conditions. On the other hand, the imperfectly drained soil is not so well suited to the growing of cotton, and this feature limits the crop rotation. Most of the imperfectly drained soil is used for growing corn and hay crops.

Kalmia sandy loam is well suited to all locally grown crops except those requiring a high lime content. It is very responsive to management, absorbing and retaining enough moisture to produce large yields when plant nutrients are supplied. Under good management, cotton yields from one-third to two-thirds of a bale to the acre, corn 20 to 30 bushels, and oats 30 to 40 bushels.

Kalmia fine sandy loam.—Kalmia fine sandy loam, which occupies second bottoms or terraces, has similar profile characteristics to Norfolk fine sandy loam of the uplands.

It has the following profile characteristics:

0 to 6 inches, gray loamy fine sand containing a small quantity of organic matter.
6 to 15 inches, grayish-yellow friable fine sandy loam.
15 to 30 inches, yellow mellow and friable fine sandy clay.
30 inches+, same material as above, except that it is slightly heavier textured and more firmly bedded and is mottled with light gray and rusty brown at a depth of 32 to 36 inches.

The land is level to slightly sloping, having a relief that is very favorable for cultivation.

Kalmia fine sandy loam is not extensive. The principal bodies are in the southern and southwestern parts of the county. The larger areas are near St. Mark Church, Mount Nebo School, Liverpool, Nebraska Church, Mount Andrew Church, Fort Hull Church, Chesson, Tysonville, Shorters Station, and Milstead.

Practically all of the land is farmed and used chiefly for cotton. Corn and hay crops are generally grown on the closely associated overflow bottoms, which comprise the Ochlockonee and Bibb soils. This soil is well suited to all locally grown crops and responds well to good farm practices. Even though a major part is used for cotton, other crops may be grown satisfactorily by using improved agricultural practices. The soil is naturally deficient in plant nutrients, and these must be supplied either in the form of commercial fertilizers or by turning under cover crops grown on land that has been fertilized with phosphate or basic slag.

Cotton yields normally from one-half to three-fourths of a bale and corn from 20 to 30 bushels an acre under good management. On the

experiment field on Kalmia fine sandy loam at Aliceville, Ala., cotton yielded an average of 990 pounds of seed cotton to the acre over a 5-year period when the land received 600 pounds an acre of a 6–10–4 fertilizer. Corn yielded 30.5 bushels when the land received 225 pounds of nitrate of soda to the acre as a top dressing in a rotation with cotton. As developed in Macon County, Kalmia fine sandy loam has a deeper and more friable subsoil than it has in the experiment field mentioned; therefore it should produce slightly greater yields under similar management. Other crops, including oats, hay crops, winter cover crops, and truck crops, should make corresponding yields.

Cahaba fine sandy loam.—Cahaba fine sandy loam is brown soil occurring on second bottoms or terraces. In profile development it is similar to Ruston fine sandy loam of the uplands, whereas it is associated with the Kalmia and Amite soils, being intermediate between them in color and structural development. It is also associated with the Wickham soils. Similar in color, it differs from those soils in being much more friable in the subsoil.

The profile characteristics are as follows:

0 to 6 inches, grayish-brown fine sandy loam or loamy fine sand.
6 to 12 inches, yellowish-brown mellow friable fine sandy loam or fine sandy clay.
12 to 30 inches, reddish-brown firm but friable fine sandy clay, slightly heavier textured than the material in the layer above.
30 inches+, slightly compact reddish-brown clay or fine sandy clay, mottled with brown and some gray, and containing some brown concretionary material.

As this soil has a very gently sloping or almost level surface, erosion is not a serious problem, but terraces in a few places on the more sloping areas are generally helpful.

This soil has a very small total area. Most of the bodies are near Shorters Station, Milstead, and Tysonville. This is one of the most productive soils in the county and is very responsive to management. It is well suited to general farm crops, but the major part is used for the production of cotton. Under good management cotton yields from ½ to 1 bale an acre and corn from 20 to 30 bushels. All other locally grown crops are adapted to this soil.

Izagora fine sandy loam.—Izagora fine sandy loam is similar to Kalmia fine sandy loam in the surface soil and upper part of the subsoil and to Leaf fine sandy loam in the lower part of the subsoil. In crop adaptation and responsiveness to management it most closely resembles Kalmia fine sandy loam. It occurs on second bottoms or terraces.

The profile characteristics are as follows:

0 to 7 inches, light brownish-gray loamy fine sand.
7 to 18 inches, grayish-yellow loamy fine sand or fine sandy loam.
18 to 25 inches, yellow friable fine sandy clay that becomes heavier in the lower part and faintly mottled with yellow and brown.
25 to 36 inches, heavy compact somewhat plastic yellow clay or heavy fine sandy clay mottled with red, brown, and some gray. Although this layer retards the percolation of water, the overlying surface soil and upper part of the subsoil are well developed, indicating fair to good internal drainage.
36 inches+, yellowish-gray heavy plastic clay intensely mottled with light gray, brown, and some red.

Owing to the close association of this soil in position and profile development between Kalmia fine sandy loam and Leaf fine sandy loam, a small acreage of each soil is included with the other. Also included with this soil are a few areas of Izagora sandy loam. They are principally between Brown School and Providence Church, northeast of Tuskegee near Eufaupee Creek, near Concord Church, and near Bethlehem Church (the one in the south-central part of the county). These areas have a coarser sand surface soil than is characteristic of Izagora fine sandy loam.

The total area of Izagora fine sandy loam is fairly large. The principal bodies are in the southern and southwestern parts of the county, near Downs, St. Mark Church, Macon County Training School, Pisgah School, Mount Pleasant Church, Bethel Grove Church, Nebraska Church, Fort Hull Church, Shiloh Church, and Chesson; south of Calebee; south of Tysonville; and west of Hardaway.

Izagora fine sandy loam is well suited to all locally grown crops. A large part, however, is used for the production of cotton, as corn and hay crops are grown largely on the Bibb and Ochlockonee soils, which are in close proximity to this soil. Since the surface soil and subsoil of Izagora fine sandy loam are similar to the corresponding layers of Kalmia fine sandy loam, the Izagora soil is comparable to that soil, but it is not considered quite so responsive to management. Yields of one-third to three-fourths of a bale of cotton to the acre are normally produced under good management. Other crops may be grown equally well. Crop and fertilizer recommendations for Kalmia fine sandy loam are equally satisfactory for this soil.

Amite fine sandy loam.—Amite fine sandy loam is similar to Red Bay fine sandy loam, the principal difference being in the topographic position of the two soils. The Amite occurs on benchlike or terrace positions, which range from a few feet to as much as 80 feet above the overflow of the streams, whereas Red Bay occurs on a plateau-like position and ranges from 50 to 150 feet above the Amite.

Amite fine sandy loam has the following profile characteristics:

0 to 5 inches, brown friable fine sandy loam.
5 to 8 inches, brownish-red friable heavy fine sandy loam containing dark colorations as result of organic matter.
8 to 58 inches, bright brownish-red fine sandy clay, friable under favorable moisture conditions but slightly sticky when wet.
58 to 66 inches, light-red to yellowish-red fine sandy clay, more friable than the layer above.
66 inches +, interstratified sand and rounded quartz pebbles. The latter range from ½ to 1½ inches in diameter.

The surface of this soil is nearly level or gently undulating, and terraces are seldom needed except along some slight escarpments. This soil is not extensive. Practically all of it lies on the second bottoms or terrace positions along the Tallapoosa River. The largest areas are near Tysonville, Shorters Station, Milstead, and St. Paul Church.

All the land is in cultivation. This is one of the most highly prized soils in the county and is used largely for the production of cotton, oats, cowpeas, and some corn. Cotton yields normally range from ½ to 1 bale or more to the acre when the land is liberally fertilized. Recommendations relative to crops, fertilizations, and management of Red Bay fine sandy loam should be suited to this soil. It is

possibly slightly better suited to the production of corn than Red Bay fine sandy loam, as it retains and gives up moisture a little better than does the Red Bay soil. On the other hand, it is possible that this soil and Red Bay fine sandy loam are better suited to the production of legumes than most of the sandy upland soils. These soils contain some lime and magnesium, which are very beneficial for legumes. Alfalfa has been grown successfully on a similar soil in Hale County, where an application of 1 ton of basic slag to the acre has been used.

SOILS WITH BROWN SURFACE SOILS AND FRIABLE SUBSOILS ON FIRST OR SECOND BOTTOMS

The soils with brown surface soils and friable subsoils on first or second bottoms, constitute 3.3 percent of the area of the county. These soils are considered the best in the county for the production of corn, sorgo, and hay crops. They are subject to frequent overflows during the winter, or they occur on low second bottoms or terrace positions. New soil materials are deposited frequently as the result of sheet erosion or stream overflow from the surrounding soils. The soils are seldom overflowed during the growing season except in small areas, and crops are fairly safe on most of the areas the greater part of the time.

The soils of this group on first bottoms or low terrace positions are Congaree silt loam, Congaree loamy fine sand, Ochlockonee silt loam, Wickham silt loam, and Augusta silt loam; and Jamison fine sandy loam occurs in swales, slight depressions, and level areas at the base of slopes, in the uplands and terraces.

Probably 75 percent of the area of these soils is used for pasture, as they are well adapted to carpet grass, Dallis grass, lespedeza, and Bermuda grass. Practically all of these soils not in cultivation can be utilized for crops by deepening some of the stream channels and by improving the surface drainage with the aid of ditches. Detailed discussions relative to crops and fertilizers are set forth in the section on Land Uses and Agricultural Methods (p. 73).

Congaree silt loam.—Congaree silt loam is one of the major soils of the county for the production of corn and hay crops. It occurs on the first bottoms of the Tallapoosa River and Eufaupee Creek and is subject to overflow during high waters.

It has the following profile characteristics:

0 to 8 inches, brown, mellow, friable, slightly micaceous silt loam.
8 to 40 inches, light-brown friable silt loam containing some fine mica scales.
40 inches +, grayish-yellow to yellowish-gray silty clay mottled and splotched with light gray and rusty brown.

On some of the higher lying positions, brown highly micaceous loamy very fine sand is present at a depth of 6 to 10 inches. These spots are about as productive and are not subject to such frequent overflows as typical Congaree silt loam. An area of about 200 acres near Milstead has a gray subsoil at a depth of 10 to 15 inches, which lessens its productivity to a certain extent, although it is still productive. Congaree silt loam is not extensive. The larger areas are near Milstead, Pleasant Hill Church, Hornady, and along the Tallapoosa River.

Probably 70 percent of this soil has been cleared and is available for cultivation. The main area still in timber is on the north side of Eufaupee Creek north of Franklin Station. Yields of 30 to 60 bushels of corn to the acre are obtained on the tilled areas of this soil. Corn billbugs have infested some areas of this soil, making it necessary to rotate crops in order to avoid serious damage by this insect. Legumes and possibly cotton may be used in the rotation. At present a small part of this soil is used for the production of cotton, and yields of ½ to 1 bale an acre are obtained. Cotton is grown on the higher positions that are less subject to frequent overflows. Oats are grown on some of the higher positions, and yields of 25 to 40 bushels are obtained. Sorgo or sugarcane return large yields on this soil.

Very little or no fertilizer is used, although it is possible that fertilizers high in phosphate and potash would be beneficial for cotton. These nutrients hasten the development and maturity of the cotton. It is also probable that a complete commercial fertilizer would be profitable for the production of corn, especially on the higher lying areas that are seldom overflowed. Owing to frequent overflows on the lower areas it is doubtful whether sufficient increases would be obtained from fertilizer to justify its use.

Congaree loamy fine sand.—Congaree loamy fine sand occurs in close association with Congaree silt loam. It differs from the latter principally in that it has a coarser texture, occupies a slightly higher position, and in many places is adjacent to the stream channels. It is less subject to overflow than Congaree silt loam and does not receive so much silting as the latter. Also, it is not so productive. The soil to a depth of 40 or more inches is brown loamy fine sand or loamy very fine sand containing a large quantity of finely divided mica.

Elongated areas of this inextensive soil are adjacent to the Tallapoosa River and near the mouth of Eufaupee Creek. The larger bodies are near Milstead, Chehaw, Pleasant Grove Church, Cloughs, Franklin Station, and Hornady. A large part of the land is subject to overflow from two to four times yearly. A few of the higher points are very seldom overflowed. A small area along Cubahatchee Creek is subject to frequent overflow. This area is used for the production of corn, which yields 20 to 40 bushels an acre. It is more subject to overflows than other bodies of this soil.

Congaree loamy fine sand is very easily tilled and can be plowed shortly after rains. Notwithstanding its sandy character, it is well suited to general farm crops and particularly well suited to truck crops. A large part is used for the production of corn, sorgo, and hay crops. Under good management, yields of cotton normally range from ½ to 1 bale an acre and corn from 15 to 30 bushels. A part is used for pastures, which produce lespedeza, hop clover, Bermuda grass, and some carpet grass and Dallis grass. The areas used for pasture are generally more sandy than those used for crops.

Ochlockonee silt loam.—Ochlockonee silt loam represents material that has been carried by drainage waters and deposited in the first bottoms along some of the smaller streams. It occupies the better drained positions along these streams and is recognized as a brown soil in these positions.

It has the following profile characteristics:

0 to 5 inches, brown or dark-brown mellow silt loam or silty clay loam containing considerable organic matter.
5 to 24 inches, brown friable silty clay or heavy silt loam.
24 inches +, same material as above except that it contains some light-gray and rust-brown mottlings and becomes intensively mottled with light gray at a depth ranging from 30 to 40 inches.

Most areas of this soil are elongated and narrow, and they lie adjacent to the stream channels. The poorly drained parts of the bottoms, mapped as Bibb silt loam, lie farther back toward the uplands.

A small area is mapped, principally near Brownville No. 2 School, Mount Andrew Church, Brown School, Tuskegee, Fort Hull Church, and Darlington Church.

Approximately 75 to 85 percent of the land has been improved and converted into farm land or pasture, and probably 60 percent of the cleared land is used for pasture. It is naturally adapted to carpet grass, Dallis grass, lespedeza, and hop clover. The cultivated areas are used principally for the production of corn and hay crops, for which purposes they are especially well suited. Very little or no fertilization is needed, and yields of corn normally range from 15 to 40 bushels an acre. The principal hay crops are soybeans and cowpeas, which yield 1 to 2½ tons of hay to the acre. This soil is subject to overflow, and crops are sometimes lost or seriously damaged as a result of the overflows. This tendency to overflow, together with the adaptability of this soil to grass, accounts for the large proportion of the land that is used for pasture grasses.

Wickham silt loam.—Wickham silt loam is closely associated with Congaree silt loam and resembles that soil to a marked degree in surface appearance and land use. It is intermediate in development between that soil and Wickham fine sandy loam. It occupies a slightly higher position than the Congaree soil, but practically all of it is subject to overflow during extremely high inundations. During overflows the water backs onto this soil, and it is always benefited as a result of the silting that takes place.

It has the following profile characteristics:

0 to 5 inches, brown mellow silt loam containing considerable organic matter.
5 to 8 inches, brown mellow silt loam or silty clay loam. Some rusty-brown splotches and streaks are present. In some locations this layer continues to a depth of 12 inches. The productivity of the soil increases with increase in the depth of this layer.
8 to 40 inches, smooth firm light-brown silty clay containing finely divided mica flakes.
40 inches +, brownish-yellow firm and smooth silty clay containing finely divided mica and some soft, very small iron concretions. The concretions are not everywhere present.

A few areas of Augusta silt loam that are too small to separate on the map are included. These areas have essentially the same land use as Wickham silt loam.

Wickham silt loam occurs along the Tallapoosa River terraces, occupying a position between the soils that are normally overflowed two to four times a year and those that are never overflowed. The total area is small. The principal areas are near Milstead, Shorters Station, Tysonville, and Chehaw.

All the land, other than a few small areas included in pasture, is available for cultivation and is utilized each year for crops. The major part is used for the production of corn, oats, hay crops, and some cotton. This soil is particularly well suited to corn and hay crops. Acre yields of 15 to 40 bushels of corn and 25 to 40 bushels of oats are produced with very little or no fertilization. Yields of hay crops are equally satisfactory. Cotton tends to produce too much vegetation; consequently the boll weevil damage is great. From ½ to 1 bale of cotton to the acre is normally produced when very little or no fertilization is used. For cotton it is desirable that a fertilizer high in phosphate and potash be used, as these plant nutrients hasten maturity and promote hardiness. Dallis grass, Bermuda grass, lespedeza, hop clover, and white clover are adapted to this soil and are grown on most of the areas used for pasture. An application of 300 to 600 pounds of basic slag to the acre, or the equivalent of superphosphate, should make this an excellent soil for pasture.

Augusta silt loam.—Augusta silt loam is closely associated with and related to the Wickham, Altavista, and Roanoke soils. The materials composing each of these soils were transported by the river or large streams in the northern part of the county from the Piedmont Plateau and deposited on the terraces or second bottoms. The Augusta soil is intermediate in profile development between the Altavista and Roanoke soils.

Augusta silt loam has profile characteristics as follows:

0 to 5 inches, brownish-gray mellow silt loam containing many iron concretions.
5 to 12 inches, light-yellow to grayish-yellow friable silty clay containing many soft iron concretions and rusty-brown mottlings.
12 to 20 inches, yellowish-gray brittle and somewhat compact silty clay mottled and splotched with gray, yellow, and rusty brown, together with iron concretions.
20 inches +, gray, brittle, and compact clay or silty clay mottled and splotched with rusty brown and iron stains.

This soil includes some small bodies of Altavista fine sandy loam and Roanoke silt loam that are too small to separate.

Augusta silt loam borders the Tallapoosa River, occupying a relatively low position on the second bottoms or terraces. Most of it is subject to overflow during extremely high water, and silt is generally deposited during these overflows. The total area is small. The principal areas are near Milstead, Shorter, and Tysonville. Drainage of this soil is rather slow, but most of the soil is sufficiently well drained for spring and summer crops, although artificial drainage is needed in some locations.

This soil is used for general farm crops and pasture. Probably 50 percent is used for pasture; the rest is used for corn, oats, sorgo, cowpeas, velvetbeans, soybeans, and a small quantity of cotton. From fair to good yields of each of these crops are produced. Corn yields from 10 to 25 bushels, oats 25 to 35 bushels, and hay 1 to 2 tons to the acre. This soil dries slowly in the spring but responds satisfactorily to good management and fertilization. It is very acid, particularly in the subsoil, and a liberal application of dolomitic limestone, phosphate, and potash is needed for most crops; corn, sorgo, and oats should, in addition, receive some nitrate fertilization. In the pasture areas carpet grass, Dallis grass, and lespedeza are the

principal forage plants. By applying phosphate or basic slag to these areas, the stands of Dallis grass and lespedeza can be improved and hop clover may be introduced. The use of fertilizers for pastures on this soil should bring profitable returns, even though fair pasture is provided under present conditions.

Jamison fine sandy loam.—Jamison fine sandy loam represents bodies often referred to as made land, as the soil material has been transported by water or has rolled or sloughed down from adjacent uplands and been deposited in lower positions, generally at the base of the slopes.

A large part of Jamison fine sandy loam occurs on low terraces. Until a few years ago this soil was gray and poorly drained, but in recent years erosion has deposited a 6- to 20-inch covering of brown or grayish-brown material. The soil has therefore been built up so as to become well suited to crops, especially corn, hay crops, and fall-sown crops. Practically all of it is devoted to these crops, and very little or no fertilizer is used.

Small areas in the uplands that are similar to areas of Jamison fine sandy loam on the terraces in development and land use are included. These inclusions are associated with the Orangeburg, Ruston, Norfolk, and Red Bay soils.

Only a very small total area of this soil is mapped, principally near Nebraska Church, south of Devine Church, south of Shorter, near Calebee Church, near St. Paul Church, and near the County Farm.

Practically all of the land is in cultivation and is utilized mainly for the production of corn and hay crops, together with some sorgo and sugarcane. Very little or no fertilizer is used, but crop yields are very good. Yields of corn normally range from 15 to 45 bushels an acre, and the other crops return proportionate yields. A few small areas are planted to cotton.

SOILS WITH SANDY SURFACE SOILS AND YELLOW OR REDDISH-BROWN COMPACT SUBSOILS

Soils with sandy surface soils and yellow or reddish-brown compact subsoils constitute 4.6 percent of the area of the county. They are next to the soils with sandy surface soils and yellow or red friable sandy clay subsoils in ease of tillage, suitability for diversified crops, and responsiveness to management. Even though these soils do not have the friable subsoils that characterize the soils of that group, the surface soils are deep enough to conserve sufficient moisture for the satisfactory production of most crops.

Natural surface drainage and internal drainage of all these soils are good. 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 plant nutrients.

Gilead sandy loam; Gilead sandy loam, slope phase; Shubuta sandy loam; and Luverne fine sandy loam occur on gently rolling uplands and are subject to erosion. These soils range from yellow to reddish brown. Erosion should be checked, because the productivity of these soils drops very sharply as erosion progresses. This is due to the fact that the heavy or compact subsoil is too near the surface.

The soils of this group on second bottoms or terraces are Flint sandy loam; Flint sandy loam, deep phase; Flint fine sandy loam; and Wickham fine sandy loam. These soils occur in level areas and are not subject to serious erosion. They range from gray to brown and generally occupy broad areas where power machinery may be used satisfactorily.

Recommended crops and fertilizers for the soils in this group are discussed further in the section on Land Uses and Agricultural Methods (p. 73).

Gilead sandy loam.—Gilead sandy loam is closely associated with Norfolk sandy loam and resembles that soil in the color and texture of the surface and subsurface layers. It differs from the Norfolk soil in having a definitely compact sandy clay subsoil, which becomes heavier textured and mottled in the lower part. In response to management and crop adaptations it is similar to Norfolk sandy loam.

This soil has the following profile characteristics:

0 to 6 inches, yellowish-gray or light-gray loamy sand.

6 to 16 inches, yellow or light brownish-yellow loose loamy sand or light-textured sandy loam. (In some localities this layer extends to a depth of 20 to 24 inches.)

16 to 30 inches, yellow compact sandy clay that breaks into a friable mass. Some finely divided mica is present, tending to give the material in this layer a smooth feel, but the sand particles are very sharp and offset the smooth feel.

30 inches +, yellow compact clay or sandy clay, highly mottled with red, brown, and some yellowish gray. The material in this layer is compact in place but is brittle when dug or bored out. It also contains some small mica flakes and sand. At a varying depth it grades into laminated sand, clay, and gravel.

This soil generally occupies slightly elevated positions, knobs, or knolls or secondary positions adjacent to stream channels or around drainage heads above the areas of the associated Norfolk soils. In many places small knolls of this soil are used for house sites, as they occupy the highest position in the vicinity. The principal areas are near Simmons School, Golddust School, Brownville No. 1 School, Tuskegee, Salem Church, McCrey Chapel, Armstrong Church, Mount Zion Church, and Notasulga.

The slope of Gilead sandy loam ranges from 2 to 6 percent and in most places is 3 or 4 percent. The lower part of the subsoil is heavy textured, and retards the percolation of water. The soil is subject to erosion, and most of it should be terraced. Losses from erosion seriously impair the response to management and the productivity of this soil as the underlying compact sandy clay is brought nearer to the surface. In an uneroded condition the surface soil protects and maintains a fairly moist condition in the subsoil, making it well suited to crops. On the other hand, as this subsoil material is brought nearer to the surface by erosion of the surface soil, the remaining soil tends to become hard, baked, and very droughty.

Gilead sandy loam is well suited to all locally grown crops. Probably 80 percent of the land is used for the production of cotton; the rest is used for subsistence crops. Ordinarily cotton yields one-half to three-quarters of a bale an acre under good management, corn yields from 18 to 25 bushels, and oats 15 to 30 bushels, when each are grown in rotation with cotton and the land is fertilized with 150 to 225 pounds of nitrate of soda to the acre as a top dressing.

Gilead sandy loam, slope phase.—Gilead sandy loam, slope phase, is closely associated with the typical soil, from which it is differentiated because of steeper slope—from 4 to 10 percent. In most places the slope ranges from 4 to 8 percent. This soil has been subjected to some sheet erosion because of the sloping surface and the heavy-textured lower subsoil layer; consequently the surface soil is not so deep as that of Gilead sandy loam.

This soil has the following profile characteristics:

0 to 5 inches, gray loamy sand.
5 to 12 inches, yellowish-gray sandy loam or loamy sand.
12 to 30 inches, yellow compact sandy clay containing small flakes of mica and sharp sand. The mica tends to give the material a smooth feel, which the sand offsets with a sandy or gritty feel. Some mottlings of gray and brown are present, particularly in the lower part of this layer.
30 inches+, yellowish-gray compact sandy clay mottled with yellow and brown and containing some mica flakes.

Some areas of Norfolk sandy loam, slope phase, are included, principally three-fourths of a mile northwest of Devine Church, 1 mile southwest of Brownville No. 1 School, 1 mile south of Notasulga, and 1 mile west of Shorter.

As this soil has sloping to rolling relief and a heavy-textured, slowly pervious subsoil, it is greatly in need of terraces where not already terraced. Control of erosion by vegetation is very helpful, especially when in the form of cover crops. Gilead sandy loam, slope phase, comprises only a small total area. The larger bodies are near Salem Church, Notasulga, Bethlehem Church, Pleasant Grove Church, Mount Sheba Church, Brownville No. 2 School, Golddust School, Simmons School, McCrey Chapel, Shorter, and Devine Church.

Where this soil has been terraced and the surface soil preserved, it is fairly well suited to general farm crops and responds satisfactorily to management. Approximately 75 percent of the land is in cultivation, the major part of which is used for the production of cotton.

Shubuta sandy loam.—Shubuta sandy loam has surface soil characteristics similar to those of Ruston fine sandy loam. The upper subsoil layer is similar to that of the Ruston soils but is heavier textured and slightly compact, whereas the lower subsoil layer is similar to that of the Susquehanna soils. This soil has somewhat the characteristics of the Cuthbert soils, but it is more uniform throughout, occupies more favorable relief, and is a much better agricultural soil than the Cuthbert.

This soil has the following profile characteristics:

0 to 9 inches, gray loamy sand or light-textured sandy loam.
9 to 12 inches, yellowish-brown friable sandy loam.
12 to 40 inches, reddish-brown compact smooth heavy-textured sandy clay, in some places containing small flakes of mica.
40 inches+, streaked and splotched red, brown, and gray compact heavy clay that is plastic when wet.

Included with this soil are a few areas of Cuthbert sandy loam, eroded phase, in the vicinities of Creek Stand and Warriorstand and in the southern part of the county. These areas are associated with areas of Norfolk fine sand.

Shubuta sandy loam is not extensive. The principal areas are near Creek Stand, Warriorstand, Devine Church, Franklin Station, Golddust School, Macon County Training School, and Vaughan Mill.

This soil has very favorable relief, the slope in few places exceeding 3 or 4 percent. The land is easily protected from erosion by the construction of terraces. As this soil has a well-developed surface soil and upper subsoil layer, it is responsive to management and well suited to diversified agriculture. It is well adapted to most locally grown crops. Any crop rotation suited to the locality may be used on this soil with fair success. Practically all the land is in cultivation, with 75 to 80 percent utilized for cotton, which under good management yields from one-half to seven-eighths of a bale to the acre.

Luverne fine sandy loam.—Luverne fine sandy loam has a general appearance of Orangeburg fine sandy loam, but it differs substantially from the latter in that the transitional friable subsurface layer characterizing the Orangeburg soils is not present and the red clay subsoil is heavier textured and much more compact.

The Luverne soil has the following profile characteristics:

0 to 6 inches, gray loamy fine sand.
6 to 9 inches, yellowish-gray fine sandy loam.
9 to 22 inches, dark-red heavy and slightly compact clay that contains some fine sand and breaks roughly into cubical fragments.
22 to 36 inches, same material as above, except that it contains some yellow and yellowish-gray splotches or mottlings.
36 to 48 inches, yellowish-red fine sandy clay mottled with yellow and some gray. This material is hard when dry, but it breaks readily into a somewhat friable mass.
48 inches+, red and yellow loamy fine sand that is very friable and pulverizes easily.

This soil is moderately to strongly acid throughout.

A small area is mapped, principally near New Georgia Church, Antioch Church, Creek Stand, and Renfro Church.

The relief of this soil is very favorable, as the slope ranges from 1 to 4 percent. Because of the heavy subsoil, rain water is absorbed slowly. This soil is subject to both sheet and gully erosion, but erosion may be prevented in large measure by well-constructed terraces.

Practically all of the land is cultivated. Cotton is the principal crop. Corn and hay crops are grown to a much smaller extent. Judging from observations made on soils similar to this on demonstration farms and individual farms, this soil is best adapted to cotton, oats, soybeans, winter cover crops, early sweetpotatoes, potatoes, and peanuts. When the land is fertilized with 200 to 400 pounds of a 6–8–4 fertilizer to the acre, cotton normally produces from one-half to three-fourths of a bale an acre. Following cotton, oats yield 20 to 40 bushels an acre when top-dressed in the spring with 150 to 225 pounds of nitrate of soda. Fair yields of corn—as much as 25 bushels—are produced on this soil in rotation with cotton when the cornland is top-dressed with 150 to 225 pounds of nitrate of soda to the acre. The other crops mentioned should produce satisfactory yields when the fertilization recommended for this group of soils in the section on Land Uses and Agricultural Methods is used. Winter legumes grown on this soil should be turned under before they attain a heavy growth. Too much organic matter turned under in the spring competes with corn for available moisture, and, unless rainfall

happens to be unusually favorable, an insufficient supply of moisture is available for the corn.

Flint sandy loam.—Flint sandy loam occurs on second bottoms or terraces along or near Eufaupee Creek and its tributaries. It is more highly oxidized and more compact in the subsoil than Leaf sandy loam, but it is not so plastic. The subsoil is heavy-textured material that has been brought down from the heavy-textured soils of the uplands along or near Eufaupee Creek and deposited by this stream before it occupied its present channel. At present this soil is not subject to overflow.

It has the following profile characteristics:

0 to 7 inches, gray loamy sand or light-textured sandy loam.
7 to 20 inches, brownish-yellow compact heavy sandy clay. The sand particles are very sharp, but the content of mica tends to give it a smooth feel.
20 to 32 inches, light brownish-yellow compact heavy sandy clay mottled with some yellowish gray and rusty brown.
32 inches+, yellow compact heavy sandy clay intensely mottled with gray and rusty brown. In many places this layer contains small mica scales and some fine sand. The underlying material is sand, clay, and micaceous material

Flint sandy loam comprises a small total area, mainly near Cloughs, Franklin Station, Oak Grove Church, Chehaw, and Tuskegee.

The loamy sand surface soil lies in direct contact with the compact subsoil, and there is no friable subsurface layer, which is so highly desirable for general farm crops. This soil does not allow so easy and free penetration of roots as those soils that have the friable transitional layer; consequently, summer-growing crops are not able to absorb as much moisture as they need. Corn is particularly affected, and cotton tends to shed its fruit during the dry periods. This condition may be overcome in part by deep plowing and the incorporation of organic matter, thereby increasing the moisture-holding capacity of the surface soil.

Practically all of the land is used for crops, principally cotton. Some hay and less corn are grown. Yields of cotton normally range from one-third to five-eighths of a bale to the acre. This soil is also used for the growing of oats, winter cover crops, velvetbeans, and peanuts. Oats yield from 15 to 30 bushels, and the other crops mentioned should produce equally as good yields.

Flint sandy loam, deep phase.—Flint sandy loam, deep phase, occurs on second bottoms or terraces along Eufaupee Creek and its tributaries. This soil has developed in large measure from heavy materials brought down and deposited by the creek.

This soil has the following profile characteristics:

0 to 8 inches, gray loamy sand containing some organic matter.
8 to 18 inches, grayish-yellow loamy sand or light-textured sandy loam.
18 to 35 inches, brownish-yellow compact heavy sandy clay that is slightly micaceous but contains sharp sand particles giving it a gritty feel. In places this layer is micaceous and is compacted loamy sand.

Flint sandy loam, deep phase, comprises a small total area. The principal bodies are near Hornady, Franklin Station, Pleasant Grove Church, Concord Church, and Tuskegee. It generally occurs in level areas.

Even though this soil is extremely sandy in the surface soil and the upper part of the subsoil, it is fairly responsive to good management. It is naturally deficient in plant nutrients, but, if management includes applications of mineral nutrients and the growth of winter cover crops or summer legumes or includes use of complete fertilizers, fair yields of crops are obtained.

It is practically all utilized for farm crops, chiefly cotton, oats, some corn, and some hay crops. When 200 to 400 pounds of 6–8–4 fertilizer is used, yields of one-third to three-fifths of a bale of cotton to the acre are normally obtained. Oats and corn are generally grown in rotation with cotton, and acre yields of 12 to 30 bushels of oats and 12 to 25 bushels of corn are produced when the land is side-dressed with 125 to 225 pounds of nitrate of soda. Peanuts are often grown in rotation with cotton without fertilization other than that obtained from the previous cotton crop.

In addition, this soil is suited to the production of watermelons, early sweetpotatoes, velvetbeans, truck crops, and peaches.

Flint fine sandy loam.—Flint fine sandy loam differs from Flint sandy loam principally in the texture of the surface soil. It occurs on terraces in a higher position than most of the surrounding soils.

It has the following profile characteristics:

0 to 6 inches, gray loamy fine sand.
6 to 24 inches, yellow compact heavy clay containing some finely divided mica, which gives the material a smooth feel.
24 to 32 inches, similar material to the above but containing considerable gray and rusty-brown mottling and becoming grayer with depth.
32 inches+, generally gray compact clay mottled with yellow and brown. In many places this layer contains some flakes of mica and is friable.

Only a small total area is mapped, chiefly near St. Paul Church and Tysonville. Other areas are near Shorters Station.

Even though this soil has excellent relief and a slope that in few places is more than 2 percent, in some places it is subject to erosion. This is because the compact subsoil does not allow water to percolate readily and thereby causes it to move off horizontally, carrying part of the soil with it.

Practically all of the land is cleared and used for cotton. Corn and summer hay crops are not well suited to this soil under present cultural methods, and they are generally grown on the associated first bottoms and swales. Ordinarily cotton yields from one-third to five-eighths of a bale an acre with the usual application of 200 to 300 pounds of 3–8–4 fertilizer and a side dressing of 50 to 75 pounds of nitrate of soda to the acre. The soil is also suited to oats, winter cover crops, velvetbeans, and peanuts.

Wickham fine sandy loam.—Wickham fine sandy loam occurs principally on the second bottoms or terraces along the Tallapoosa River and resembles Cahaba fine sandy loam in color. Compared with the Cahaba, it has a more compact, smooth, and slowly pervious subsoil and does not absorb or give up water to growing plants so freely.

This soil has the following profile characteristics:

0 to 6 inches, brownish-gray fine sandy loam containing some fine mica flakes.
6 to 30 inches, reddish-brown smooth granular but slightly compact clay containing a large quantity of finely divided mica.

30 to 40 inches, a reddish-yellow very fine sandy clay mottled with some brown. The material in this layer is slightly more friable than that in the layer above.
40 inches +, grayish-yellow or yellow loamy fine sand.

In many places the underlying material is heavy clay, but in most places it is fine sand or loamy fine sand. At Hornady the loamy very fine sand is present at a depth of 18 inches. Here, the subsoil is slightly more friable than typical.

The materials giving rise to Wickham fine sandy loam were brought from the red piedmont hills of east-central Alabama by the Tallapoosa River and its tributaries and deposited before the river cut its present stream channel. This soil now lies from 3 to 15 feet above the high-water mark. Part of it may have been overflowed when the Tallassee Dam (on the Tallapoosa River just north of Macon County) broke.

The light-textured surface soil rests directly on the compact, smooth, firmly bedded, highly micaceous clay subsoil. This condition is unfavorable for the retention and movement of capillary moisture and the penetration of roots; consequently moisture becomes to a certain extent a limiting factor for certain crops.

This is not an extensive soil. Most of it lies adjacent to the Tallapoosa River; other areas occur along Eufaupee Creek. The larger ones are near Cloughs, Franklin Station, Pleasant Grove Church, Chehaw, Shorters Station, Tysonville, Milstead, and Tuskegee.

The land is practically level and lends itself very well to the use of power machinery. Practically all of it is utilized for general farm crops, principally oats and cotton, for which it seems best suited. Yields of one-third to two-thirds of a bale of cotton and 30 to 40 bushels of oats to the acre are produced under good management. Corn and hay crops, other than cowpeas following oats, are generally grown on the associated soils of the first bottoms. In addition to the above crops, this soil is well suited to peanuts, winter cover crops, and other crops that grow during the winter and spring. As this soil is closely associated with Congaree silt loam and Wickham silt loam, both of which are well adapted to corn and hay crops, it is advantageous on many farms to use this soil exclusively for oats, cowpeas, and cotton.

SOILS WITH SANDY SURFACE SOILS AND MOTTLED HEAVY PLASTIC CLAY SUBSOILS

Soils with sandy surface soils and mottled heavy plastic clay subsoils constitute 9.5 percent of the area of the county. They have shallow very fine sandy surface soils and plastic mottled clay subsoils. They therefore warm slowly in the spring, cannot be farmed under so wide moisture conditions as many of the other soils, and are best suited to cotton, oats, sorgo, peanuts, soybeans, winter cover crops, and pasture grasses.

Soils on both uplands and terraces are included with this group. They are all acid to strongly acid in reaction, and a large quantity of lime is needed for most crops, especially leguminous crops. The soils of the uplands are Macon very fine sandy loam, Susquehanna very fine sandy loam, Vaiden very fine sandy loam, and Oktibbeha fine sandy loam. In general, the surface of these soils is gently rolling, and

they are subject to severe sheet and gully erosion on the more sloping areas. All the sloping areas should be terraced if the soil is to be used for farm crops. The soils of the true terraces are Leaf sandy loam and Leaf fine sandy loam. They have an almost level surface and are imperfectly to poorly drained. In many places ridging is necessary for the satisfactory production of oats and winter cover crops. Drainage ditches are necessary in many places in order to remove surplus water.

Further discussion of crops and fertilizers for the soils of this group may be found in the section on Land Uses and Agricultural Methods (p. 73).

Macon very fine sandy loam.—Macon very fine sandy loam differs principally from Susquehanna very fine sandy loam in having a brown surface soil, a brown to slightly greenish brown subsoil, and favorable relief.

It has the following profile characteristics:

0 to 6 inches, light brownish-gray very fine sandy loam.
6 to 15 inches, dark-brown plastic clay with a greenish cast and containing a large quantity of very fine sand. Some dark-red and gray mottling are present.
15 to 21 inches, dark-brown heavy plastic clay faintly mottled with reddish brown, yellow, and gray. Under favorable moisture conditions this material breaks into cubes of varying sizes. When wet it is extremely plastic.
21 to 40 inches, dark-red or dark reddish-brown plastic clay highly mottled or streaked with olive drab, light gray, and yellow. This material breaks into small cubical aggregates with colloidal-coated sides. When wet it is extremely sticky and plastic.

The relief is level to very gently sloping. Surface drainage is fair to good, whereas internal drainage is slow but ample for most crops. The principal areas are south of Society Hill and near Kelley Store.

All the land has been brought into cultivation and is used almost entirely for the production of cotton. It is especially well adapted to the production of oats and winter cover crops. Under good management—and most of this soil is well managed—cotton normally yields from ½ to 1 bale an acre, oats 25 to 30 bushels, and soybeans, cowpeas, sorgo, peanuts, most truck crops, and garden vegetables proportionately well. Very little corn is grown. This soil is managed more easily and is more productive than the other soils of this group.

Susquehanna very fine sandy loam.—Susquehanna very fine sandy loam is recognized by its gray surface soil and red, gray, and yellow mottled heavy plastic subsoil, which is exposed in many places as a result of both sheet and gully erosion.

The following profile characteristics are typical:

0 to 5 inches, light-gray to yellowish-gray very fine sandy loam This layer ranges in thickness from 1 to 6 inches, depending on the degree of erosion. In many places the surface is very spotted and the raw clay is exposed.
5 to 15 inches, red or brownish-red heavy plastic clay mottled with some gray and yellow.
15 to 25 inches, red heavy plastic clay mottled with yellow, gray, and some brown.
25 inches+, gray heavy plastic clay, intensely mottled with red and grayish yellow and becoming darker gray with depth.

This soil is moderately to strongly acid throughout.

Included with Susquenhanna very fine sandy loam are a few small areas having a yellow fairly friable upper subsoil layer extending to a depth of 8 to 10 inches. These included areas are more productive and responsive to management than the typical Susquehanna soils. They are all level. Another inclusion comprises a few areas of Eutaw very fine sandy loam, which differs from the Susquehanna soil in that the subsoil is dominantly gray plastic clay mottled with some red and brown.

This is a fairly extensive soil. The largest areas are in the southeastern part of the county, having the more gentle relief of the red clay hill areas. A few areas are level, but most of them are undulating to gently rolling, the slope ranging from 2 to 7 percent in gradient. The principal bodies are near Nebraska Church, Mount Pleasant Church, Danners Chapel, Liberty Hill School, Mount Nebo School, Macon County Training School, Hardaway, Pisgah School, Sweet Kingdom Church, Liverpool, Mount Andrew Church, St. Mark Church, Shiloh Church, Calebee Church, Boromville, Swanson School, Society Hill, County Farm, and Tuskegee Institute Farm.

Erosion on this soil presents a serious problem. The subsoil is so heavy that the downward movement of water is very slow, and consequently the surface movement of water is rapid, causing severe sheet and gully erosion. A few small areas have such a favorable relief that the movement of surface water is fairly slow, and on them erosion is not serious. If farmed, this soil should be carefully terraced.

Approximately 75 percent of the land has been cleared and is used for general farm crops and pastures; the rest is used for woodland pasture. Probably 50 to 60 percent of the cleared land is used for farm crops. The cultivated areas are used in a large measure for cotton and to a less extent for oats, velvetbeans, and hay crops. Corn and sorgo are generally grown along the bottoms and in the swales. Cotton yields normally from one-fifth to one-half of a bale or slightly more to the acre. This soil is well suited to pasture plants—lespedeza, carpet grass, Dallis grass, hop clover, and Bermuda grass. An application of 200 to 500 pounds of basic slag to the acre, or the equivalent of superphosphate, in addition to lime, should increase the quality and quantity of the vegetation.

As this and other Susquehanna soils are extensive in Alabama, the Alabama Agricultural Experiment Station is starting some experiments to determine the best cropping systems, grasses, and fertilizers for the various crops on this soil. Prior to the release of such information it is suggested that the fertilizer and crop recommendations discussed for this group in the section on Land Uses and Agricultural Methods (p. 73) be followed.

Vaiden very fine sandy loam.—Vaiden very fine sandy loam is a yellow sandy prairie soil occurring in close association with the true Black Belt soils of the southern part of the county.

It has the following profile characteristics:

0 to 4 inches, yellowish-gray very fine sandy loam. The thickness of the surface layer ranges from 1 to 8 inches but generally is 3 or 4 inches.

4 to 12 inches, light brownish-yellow plastic silty clay. This layer tends to form aggregates under normal conditions, but under slight pressure it becomes both cohesive and adhesive or plastic.

12 to 30 inches, yellow stick clay finely mottled with rusty brown and gray.
30 to 40 inches, limy or marly yellow clay containing soft nodules of lime intermixed with yellow plastic clay.
40 inches+, partly weathered chalk.

The surface soil is slightly acid, the subsoil layer is strongly acid, and the underlying chalky material is alkaline.

A fairly large area is mapped, mainly in the southern part of the county. The larger bodies are south of Liberty Hill School and near Macon County Training School, Spring Hill Church, St. Paul School, St. Mark Church, Bunkey Chapel, Hardaway, Downs, Swanson School, and Renfro Church.

Vaiden very fine sandy loam occurs on broad undulating ridges and has a slope that ranges from 1 to 6 percent but in most places is about 3 percent. Surface drainage is good to excessive, but internal drainage is slow, owing to the heavy character of the subsoil.

Although this soil has gentle relief, it is subject to severe erosion. The erodibility is due in large measure to the fact that the heavy subsoil does not allow water to percolate readily. Well-constructed terraces are especially needed for the maintenance of this soil.

Probably 60 to 75 percent of the land is cultivated; the rest is used for pasture. Cotton is the principal crop on the cultivated areas, and cowpeas, velvetbeans, sorgo, peanuts, Johnson grass, and some corn are grown. The principal pasture vegetation includes lespedeza, carpet grass, Bermuda grass, Dallis grass, and hop clover.

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 under Land Uses and Agricultural Methods (p. 73). Vaiden very fine sandy loam is easier to manage, owing to its sandy surface soil, absorbs rainfall more readily, and is probably more responsive to management than Vaiden clay; otherwise the recommendations contained in the section referred to should be applicable.

Oktibbeha fine sandy loam.—Oktibbeha fine sandy loam is known as red sandy prairie. It is very similar to Oktibbeha clay and differs from the latter soil principally in that it has a shallow brownish-gray sandy surface soil.

It has the following profile characteristics:

0 to 4 inches, brownish-gray fine sandy loam.
4 to 15 inches, red plastic clay containing a few faintly conspicuous gray mottlings.
15 to 30 inches, red plastic clay intensely mottled with gray and yellow.
30 inches+, highly weathered chalk.

The surface soil and subsoil are strongly acid in reaction, whereas the underlying chalk, which lies from 28 to 35 inches below the surface, is very calcareous or alkaline.

Oktibbeha fine sandy loam is one of the minor soils of the prairie part of the county. The principal bodies are near Downs, Oak Grove School, Hannon, and Renfro Church.

The land is gently rolling, in few places having a slope of more than 6 percent. It is subject to erosion and, unless carefully terraced or sodded to pasture grasses, will lose its surface covering and become Oktibbeha clay. Erosion has already reduced many small areas to this condition.

Practically all of the land has been cleared for cultivation and is used largely for general farm crops and pasture. Cotton is the chief crop, and under good management, yields normally range from one-fourth to one-half of a bale an acre. This soil also is well suited to the production of oats, velvetbeans, cowpeas, soybeans, and lespedeza. When grown in rotation with cotton on land that has been heavily fertilized, and when top-dressed in the spring with 150 to 225 pounds to the acre of nitrate of soda or its equivalent, oats yield from 20 to 35 bushels an acre. When grown in rotation with cotton and when the land is fertilized with 150 to 225 pounds of nitrate of soda, corn produces from 12 to 25 bushels.

Leaf sandy loam.—Leaf sandy loam is similar to Leaf fine sandy loam, the principal difference between the two soils being in the texture of the surface soil. Like Leaf fine sandy loam, this soil is closely associated with the clay hills from which the soil materials are largely derived. It occurs on second bottoms or terraces, and the materials were deposited by streams before they occupied their present channels.

This soil has the following profile characteristics:

0 to 7 inches, gray loamy sand or light-textured sandy loam.
7 to 14 inches, light yellowish-gray friable sandy loam containing a few gray and brown mottlings.
14 inches+, gray plastic clay mottled with brown, red, and yellow.

A small total area is mapped, chiefly near Concord Church, Pleasant Grove Church, Macon County Training School, and Swanson School.

Surface drainage of this soil is only fair, and internal drainage is poor, thus preventing the soil from warming until late in the spring.

Probably 25 to 35 percent of the land is in cultivation, and the rest is used principally for pasture. Carpet grass and Bermuda grass are the chief pasture grasses. In some places sesbania and benne are grown for quail feed. The cultivated areas are used for cotton, sorgo, soybeans, corn, and cowpeas. Normally, cotton yields from one-fifth to one-half of a bale to the acre, corn 5 to 15 bushels, and hay crops one-third to 1 ton. These yields are obtained under good management and liberal fertilization, except the hay crops, which are seldom fertilized.

Leaf fine sandy loam.—Leaf fine sandy loam occurs on second bottoms or terraces. The materials forming this soil have been washed from the heavier soils of the uplands, principally Susquehanna fine sandy loam and Susquehanna clay. These materials were deposited by the streams long before they reached their present channels. The soil lies from 10 to 25 feet above present high-water overflow.

This soil has the following profile characteristics:

0 to 6 inches, light-gray loamy fine sand or fine sandy loam.
6 to 14 inches, pale yellowish-gray fine sandy clay containing some rusty-brown and yellow mottlings. This layer is fairly friable but is slightly sticky when wet.
14 to 30 inches, yellowish-gray heavy plastic clay intensely mottled with brown, yellow, and some red. The gray increases with depth.

This soil occurs in close association with Calebee fine sandy loam and occupies somewhat lower positions than the Izagora soil. It is

more or less wet during a large part of the winter and early spring. Natural drainage, however, is better than on Myatt fine sandy loam, with which it is also associated.

Leaf fine sandy loam is one of the most extensive soils occurring on second bottoms or terraces. About 8,704 acres are mapped, chiefly south of Mount Nebo School and near Downs, Hardaway, Bunkey Chapel, St. Mark Church, Nebraska Church, Fort Hull Church, Shiloh Church, Chesson, and Swanson School. Many areas are scattered throughout the southern part of the county.

As the areas of Leaf fine sandy loam are level, surface drainage is slow. Because of the heavy character of the subsoil, internal drainage also is slow. Artificial drainage is necessary in many places.

Probably 20 to 30 percent of the land is in cultivation year after year; the rest is used for pasture and range land, producing principally carpet grass, Bermuda grass, lespedeza, briers, and bushes. This soil is extremely acid and is best adapted to crops that will withstand high acidity. Sorgo, sugarcane, cotton, corn, cowpeas, and soybeans are best adapted. Normally crop yields are rather low, ranging from one-fifth to one-half of a bale of cotton and 5 to 12 bushels of corn to the acre. Yields of other crops are correspondingly low. These yields are obtained when comparatively small quantities of low-grade fertilizers are used. Winter cover crops are difficult to grow except in the better drained locations. The crop yields can be increased, however, by a liberal application of commercial fertilizer or by using phosphate, potash, and lime and turning under summer legumes or winter legumes in the better drained areas.

CALCAREOUS HEAVY CLAY SOILS

Calcareous heavy clay soils cover only a small total acreage—1.7 percent of the area of the county. They are the true Black Belt soils and are the only alkaline soils in the county. They require strong work animals for satisfactory tillage. Sheet erosion is a serious problem. These soils are suited only to crops that are adapted to alkaline soils. Dallis grass, Dutch white clover, sensitive plant, partridge-peas, black medic, sorgo, soybeans, and corn, and possibly oats and alfalfa are best suited to these soils. They are used largely for pasture, as they are well suited to pasture grasses.

Before the boll weevil became a serious pest, the soils of the prairie and associated heavy clay soils were used largely for the production of cotton and were considered some of the best soils in the county for this crop. These soils warm later in the spring and produce later bolls than the sandy soils, so that the weevils ruin much of the crop, and therefore the growing of cotton is now uncertain. These soils are difficult to manage; that is, they must be plowed and tilled within a narrow range of moisture conditions, as they become extremely hard when dry. At present the agriculture on these heavy clay soils consists mainly of livestock raising, together with the production of Johnson grass and a small quantity of cotton and corn.

Houston clay, shallow phase; Sumter clay, and Bell clay constitute the members of this group. With the exception of Bell clay, these soils occur on the uplands. The Sumter soils have gently rolling relief, and the Houston soil occurs in almost level areas. Despite their favorable relief, the soils are subject to considerable sheet

erosion. Bell clay, on the other hand, occupies low positions and is enriched or improved by the deposition of materials at the expense of the surrounding soils, principally the Houston and Sumter.

Crops and fertilizers adapted to these soils are discussed under Land Uses and Agricultural Methods (p. 73).

Houston clay, shallow phase.—Houston clay, shallow phase, is locally known as black prairie. (In technical nomenclature the Houston and associated dark-colored soils are called Rendzina soils.) Sheet erosion has removed a large part of the original surface soil, leaving this soil much lighter colored and shallower than it was originally. Enough organic matter remains in the surface soil to give it a dark color.

This soil has the following profile characteristics:

0 to 10 inches, dark grayish-brown clay or silty clay containing small nodules of lime. This layer contains a large quantity of organic matter, giving it a black appearance when wet. In many places this layer extends to a depth of 12 to 15 inches.

10 to 14 inches, light grayish-yellow clay containing small nodules of lime interspersed through the clay. It is sticky and plastic when wet and fairly friable under favorable moisture conditions.

14 to 30 inches, pale brownish-yellow compact plastic clay mottled with bluish gray, rusty brown, and brownish yellow and containing nodules and streaks of lime. The clay of this layer tends to be acid, but when the lime nodules are mixed with the clay it becomes alkaline in reaction.

30 to 48 inches, distinctly mottled bluish-gray and brownish-yellow compact plastic clay containing many nodules and irregular streaks of lime.

48 inches+, partly weathered chalk or calcareous material.

Included with this soil are a few areas of Houston clay that have a dark-brown or almost black surface soil from 15 to 20 inches in thickness. Such areas represent the original soil before sheet erosion removed a part of the surface soil. A few small spots of Sumter clay are also included.

This is a true Black Belt soil, and it is all in the southern part of the county, where it covers a small total area. The principal areas are near Downs, Hardaway, and northwest of Hannon, and smaller areas are scattered in the same section.

This soil has very gentle relief, the slope in few places exceeding 3 percent. Because of the heavy texture of the soil and the slow internal drainage, surface drainage tends to be excessive; that is, not much of the rainfall is taken up by the soil. Properly constructed terraces and a cover crop or sod are needed to control sheet erosion. Unless the surface is protected by a grass cover, sheet erosion is active.

This soil is used largely for pasture, consisting of Dallis grass, black medic, partridge-peas, white clover, hop clover, and Johnson grass. It is considered a good soil for pasture grasses. Lespedeza grows in a few places, but it is generally chlorotic and does not grow satisfactorily. A few areas are used for the production of general farm crops, principally oats, cotton, corn, and some hay crops.

Sumter clay.—Sumter clay is locally known as "gray lime prairie," as it consists largely of highly weathered decomposed Selma chalk with some organic matter in the surface layer. In a few areas the surface soil somewhat resembles that of Houston clay or Bell clay,

but in general it is much lighter colored than the corresponding layer of those soils. It has a high lime content in the surface soil as well as in the subsoil. It is alkaline throughout.

In the main, Sumter clay has the following profile characteristics:

0 to 3 inches, gray or light-gray calcareous and friable clay containing some organic matter. It is sticky when wet but is friable and granular under favorable moisture conditions.

3 to 10 inches, light yellowish-gray friable calcareous clay containing some fragments and nodules of lime.

10 to 40 inches, light grayish-yellow friable calcareous clay containing a large quantity of white nodules and fragments of lime and some brownish-yellow stains.

40 inches+, partly weathered chalk grading into blue or grayish-blue hard chalk at a depth of 4 to 8 feet.

All the materials of these soil layers are somewhat sticky when wet, but under favorable moisture conditions they are easily pulverized. This is the only soil of the Black Belt that will scour off the plow under moist conditions.

A few areas here and there of less than 1 acre each of Oktibbeha and Vaiden soils—too small to separate on the soil map—are included. In addition approximately 170 acres of a so-called shell soil are included. The principal areas of the latter are southeast of Brown School and south of Hardaway. This included soil differs from Sumter clay in that it consists largely of partly weathered and decomposed oystershells, which were deposited more recently than the Selma chalk from which Sumter clay is derived. This inclusion is calcareous in reaction and has the same land use as Sumter clay.

A small total area of Sumter clay is mapped, principally near Downs, Hardaway, and Bunkey Chapel.

Areas of this soil have a 2- to 6-percent slope. Internal drainage is good, and surface drainage tends to be excessive, subjecting the soil to serious sheet and gully erosion. Well-constructed terraces are needed to conserve this soil. After erosion has been checked by terraces, the soil can be improved by turning under leguminous crops grown on land that has been heavily fertilized with phosphate. Deep plowing should be used when turning under the legume crops.

This soil is generally used for the production of pasture grasses. It is best suited to Dallis grass, Dutch white clover, Johnson grass, and black medic. Some areas are cultivated and are used principally for the growing of corn and oats.

Bell clay.—Bell clay is a dark soil associated with the Houston and Sumter soils, occupying heads of drainageways, very gentle slopes along the drainageways, and second bottoms or terraces of the prairies. It has been formed by local alluvial wash from the surrounding Houston and Sumter soils. It is very similar in many respects to Houston clay.

The following profile is characteristic of Bell clay:

0 to 12 inches, dark grayish-brown or almost black clay that is plastic when wet but when dry crumbles easily into a coarse granular structure Fragments of lime are present in some of the areas surrounded by Sumter clay.

12 to 28 inches, dark-brown or yellowish-brown heavy clay containing some yellow mottlings. This layer is slightly more plastic than the layer

above. Some small nodules and fragments of lime are present in places. This layer is variable, in many places resembling the surface soil.

28 to 45 inches, gray or yellowish-gray heavy plastic clay.

45 inches+, similar material to that above but having some lime in the lower part. This grades into and rests on the Selma chalk formation.

This is not an extensive soil. The principal bodies are near Downs, Hardaway, Bunkey Chapel, and St. Mark Church.

This soil is not subject to flooding by the streams, but a considerable proportion of it is subject to sheet flooding, during heavy rains, from the bordering uplands. Surface and subsoil drainage tend to be slow, although drainage is ample for the production of summer-growing crops and generally is ample for winter-growing 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. The crop and fertilizer recommendations are about the same as on the Houston soil, but Bell clay normally is a little more productive than that soil.

SOILS WITH HEAVY CLAY SURFACE SOILS AND MOTTLED HEAVY PLASTIC CLAY SUBSOILS

Soil with heavy clay surface soils and mottled heavy plastic clay subsoils constitute 7.2 percent of the area of the county. Their high clay content makes them difficult to till, and strong work animals are required. Farm operations are delayed in the spring awaiting favorable moisture conditions for satisfactory tillage. These soils check and crack badly on drying, are very acid in reaction, and require a large quantity of lime for neutralization. Phosphatic fertilizers are fixed readily when placed in contact with the soils. The soils are best suited to oats, sorgo, cotton, soybeans, Dallis grass, carpet grass, lespedeza, winter cover crops, and velvetbeans.

These soils occur on level to gently rolling uplands. Susquehanna clay, Oktibbeha clay, Vaiden clay, and Eutaw clay comprise the group. Practically all of the land should be carefully terraced if it is to be used for farm crops; otherwise it should be well sodded to pasture grasses. In many places the land should be ridged for the production of oats and winter cover crops, as these crops are often subject to drowning out on these soils.

Crops and fertilizers for the soils in this group are discussed under Land Uses and Agricultural Methods (p. 73).

Susquehanna clay.—Susquehanna clay is locally known as red clay hills, although this soil occupies rather favorable relief, having been separated on the map from the really hilly parts. It also is known as red post oak land. The surface soil is similar to that of Oktibbeha clay, but this soil differs from the Oktibbeha in that the underlying chalk subsoil is not present.

Susquehanna clay has the following characteristics:

0 to 4 inches, red or reddish-brown heavy plastic clay. In some places the surface layer is light-brown or grayish-brown fine sandy loam 1 to 3 inches thick.

4 to 12 inches, light reddish-brown plastic clay faintly mottled in the upper part and intensely mottled in the lower part with light gray, yellow, and red.

12 to 40 inches, marbled or mottled red, light-gray, and yellow heavy plastic clay. The gray mottling increases with depth.

Susquehanna clay occurs in rather large bodies in the southern half of the county extending from Shorter to Boromville School and Society Hill. The principal bodies are near Mount Nebo School, Liberty Hill School, Pisgah School, Liverpool, Mount Pleasant Church, Nebraska Church, Mount Andrew Church, Fort Hull Church, Shiloh Church, and Shady Hill Church; south of Tuskegee; near Swanson School; south of Society Hill; and near Mount Myriat Church and Tuskegee Institute Farm.

Even though this soil has a slope that generally ranges from 2 to 4 percent and in few places exceeds 5 percent, it is very subject to erosion. This is due to the imperviousness of the subsoil and the low absorbing capacity of the surface soil. Well-constructed and carefully maintained terraces are important for the retention of this material. Strip cropping is advantageous when it can be fitted conveniently into the farm program.

Probably 60 percent of this soil has been cleared and is now being used principally for pasture and for the production of cotton and oats.

Because of susceptibility to erosion and unfavorable structural and textural characteristics of this soil, it is better suited to pasture than to general farming. The principal pasture plants are carpet grass, lespedeza, orchard grass, hop clover, and Dallis grass.

Approximately 20 to 30 percent of the open land is used for farm crops. Cotton and oats are the chief crops, although the soil is suited to peanuts, velvetbeans, soybeans, winter cover crops, sorgo, and related crops. Normally cotton yields from one-fifth to one-half of a bale and oats 12 to 30 bushels to the acre. These yields are obtained with comparatively small applications of fertilizer.

Oktibbeha clay.—Oktibbeha clay is locally known as red prairie or red post oak land. It is closely associated with the black prairie or lime soils. It also is closely associated with and related to the Vaiden soil, differing from it principally in color and in depth to the underlying chalk.

The following profile is characteristic:

0 to 3 inches, reddish-brown clay that is sticky and plastic when wet. In places the upper 2 inches of the surface layer is fine sandy material.

3 to 18 inches, red or brownish-red heavy plastic clay containing a few faint mottlings of gray and yellow. The lower part of this layer in a few places is intensely mottled with gray.

18 to 25 inches, light brownish-yellow heavy sticky clay mottled with gray and rusty brown.

25 inches+, creamy gray or ash-colored calcareous silty clay. This layer consists of highly calcareous weathered chalk.

The surface soil and upper subsoil layer are moderately to very strongly acid, whereas the underlying material is very calcareous. The depth to the underlying chalk ranges from 18 to 40 inches.

The clay of both the surface soil and the subsoil of Oktibbeha clay are plastic when wet and hard and compact when dry. During dry seasons checks and cracks, extending well into the surface soil and subsoil and ranging from ¼ to 1 inch in diameter, appear in hayfields or in untilled areas.

Oktibbeha clay is one of the most extensive soils of the prairie. About 4,864 acres are mapped, mainly near Macon County Training School, Armstrong (in the southern part of the county), Bunkey Chapel, Downs, Swanson School, Hardaway, and Chesson.

The relief is undulating to gently rolling, and the slope ranges from 2 to 7 percent. Internal drainage is slow, whereas external drainage is excessive and causes serious sheet and gully erosion, unless the slopes are carefully terraced or sodded to pasture grasses.

Approximately 65 percent of this soil is open land and is used for pasture and general farm crops. Probably less than 25 percent of the cleared land is used for farm crops; the rest is in pasture. The soil is droughty for summer-growing crops, especially corn. Cotton is the principal crop, and some oats, cowpeas, and soybeans and a very small quantity of corn are grown. Most of these crops, other than cotton, are grown on the first bottoms and swales. Carpet grass, lespedeza, Dallis grass, Bermuda grass, and hop clover are the principal pasture plants.

Vaiden clay.—Vaiden clay is locally known as yellow clay prairie and is closely associated with Vaiden very fine sandy loam and the true Black Belt soils. It differs from Vaiden very fine sandy loam in that the texture of the surface soil is clay. This soil is closely associated with Oktibbeha clay, differing from it principally in color and in depth to the underlying chalk. The Vaiden soils are yellow or gray, whereas the Oktibbeha soils are brownish red.

The profile characteristics of Vaiden clay are as follows:

0 to 4 inches, brownish-yellow or brownish-gray heavy clay that is sticky and plastic when wet.

4 to 18 inches, yellow plastic heavy clay with a green cast and mottled with gray and some brown in the lower part.

18 inches+, yellow or yellowish-gray plastic and sticky clay with the gray increasing with depth down to the underlying chalk, which lies at a depth of 30 to 60 inches.

The surface soil and the subsoil are moderately to strongly acid, whereas the underlying material is alkaline in reaction. The principal areas of Vaiden clay are near Bunkey Chapel, Downs, Hardaway, Chesson, and Swanson School.

The relief of this soil is undulating to very gently sloping, the slope in general ranging from 2 to 4 percent in gradient. Surface drainage, therefore, is good, but internal drainage is hindered by the slowly pervious subsoil. This soil dries and warms more slowly than Vaiden very fine sandy loam, and it is tilled with greater difficulty. This soil tends to become hard and to crack during prolonged dry periods, thus hindering plant growth. Like all other heavy plastic clay soils, it is difficult to till, especially in the spring. If plowed when too wet, it runs together or puddles; and if plowed when too dry, it breaks into large clods difficult to pulverize and to work to a desirable seedbed.

Erosion is very serious on this soil; consequently well-constructed terraces are needed. Terracing for the conservation of rain water is helpful in the pastured areas and is indispensable for the maintenance of cultivated areas.

Approximately 75 percent of this soil is open land, most of which is used for pasture. Carpet grass, Dallis grass, lespedeza, and hop clover are the chief pasture plants. Cotton and oats are the major farm crops grown. Ordinarily, cotton yields from one-fifth to one-half of a bale and oats 12 to 30 bushels to the acre. These yields are obtained when comparatively little fertilizer is used.

Eutaw clay.—Eutaw clay is commonly known as gray-brown post oak land. It is also known as hog-wallow land, because of the small numerous depressions ranging in depth from 6 to 18 inches and in diameter from 3 to 8 feet. Soil-building processes have proceeded very slowly in this soil as the result of its heavy texture; consequently it is gray.

The following profile is characteristic of Eutaw clay:

0 to 4 inches, brownish-gray plastic clay. In cultivated areas the surface soil has a distinctly brown coloration. The material is sticky and plastic when wet and checks and cracks on drying, but it maintains fair tilth when farmed under favorable moisture conditions.

4 to 6 inches, grayish-yellow plastic clay that is slightly more friable than the underlying subsoil. This layer is not everywhere present.

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

30 inches+, light-gray or bluish-gray plastic clay mottled with some red, yellow, and rusty yellow. This layer is slightly lighter colored than the layer above.

This soil is strongly acid throughout.

In other parts of the State, Eutaw clay is typically associated with Vaiden clay, and it is underlain by chalk at a depth of 4 to 8 feet. In Macon County, however, this soil is associated principally with the Susquehanna soils; consequently the chalk lies much deeper than normal. In either situation the chalk lies too deep to have an apparent influence on the crop adaptation or response to management; consequently the soil associated with the Susquehanna soils shows no significant difference from the soil associated with the Vaiden soils.

South of Society Hill and near Kelley Store some areas are included that differ from Eutaw clay in that the subsoil is dominantly brown and not so intensely mottled. This inclusion is possibly a little better drained than the typical Eutaw soil, although drainage is very slow. It has the same land use as Eutaw clay.

Eutaw clay comprises a rather small total area, most of which is southeast of Tuskegee, near Shiloh Church and Shady Grove Church, and south of Society Hill. Other areas are scattered over the south-central and eastern parts of the county.

The surface of Eutaw clay is noticeably smoother than that of the associated Susquehanna soils. It is almost level to very gently undulating, and the lateral flow of water is slow. Because of the heavy clay, the downward movement of moisture is very slow. Water, therefore, stands in the small hog wallows throughout much of the winter, but the land dries out in the spring. The heavy plastic clay makes it rather difficult to prepare this soil for crops in the spring.

Probably less than 15 percent of this soil is open land, and more than 60 percent of the open land is used for pasture. It is possible that more will be opened for pasture and farm crops in the near future. Most of the cultivated acreage is planted to cotton, oats, cowpeas, and velvetbeans, as corn and sorgo are grown in the swales and along adjacent first bottoms. The forested areas support principally sweetgum, old-field pine, post oak, blackjack oak, water oak, southern red oak, and hickory. Carpet grass, lespedeza, Dallis grass, and partridge-peas are the principal pasture plants.

Eutaw clay has a rather wide crop adaptation, but its practical use is limited by the fact that it warms slowly in the spring. The time for maturing cotton is extended as the result of this delay in warming of

the soils, thereby increasing the damage from boll weevils. A large part of the land has reverted to forest since the advent of the boll weevil. Winter cover crops and oats are subject to injury, owing to drowning out and freezing, but this danger may be overcome in part by tracing or ridging the soils.

SANDS, FINE SANDS, AND LOAMY SANDS

Sands, fine sands, and loamy sands cover 9.8 percent of the area of the county. They are extremely sandy, can be tilled with light equipment, and are the earliest soils on which farm operations can be started. On the other hand, they are very subject to leaching of organic matter and the soluble plant nutrients, and an insufficient supply of moisture is retained for the production of large yields of summer-growing crops. They are best suited to spring-growing crops and peanuts, peaches, and velvetbeans, although some areas, particularly of loamy sand and loamy fine sand, under good management, produce satisfactory yields of general farm crops. These soils are used in large measure for general farm crops, but yields are normally low.

These soils occur on both uplands and terraces.

The soils of the uplands—all gray soils—are Norfolk loamy sand; Norfolk loamy sand, slope phase; Norfolk fine sand; Norfolk sand; and Norfolk sand, slope phase. With the exception of the slope phases, these soils have almost level to gently rolling relief and are not subject to serious erosion. Water percolates through the subsoil very rapidly. On the other hand, the slope phases are subject to gully erosion, and these areas should be terraced if they are to be cultivated. Only small areas are cultivated—most of them less than 5 acres in size and many of them less than 2 acres.

The soils of this group occurring on the terraces are light brown, yellowish gray, and light gray. They are Cahaba loamy sand, Kalmia loamy fine sand, and Kalmia sand, respectively. They occupy level areas and are utilized in large measure for truck patches, general farm crops, and building sites.

On page 73 in the section on Land Uses and Agricultural Methods is a discussion of crops and fertilizers suitable for these soils.

Norfolk loamy sand.—Norfolk loamy sand is intermediate in texture between Norfolk sandy loam and Norfolk sand. In response to management it also is intermediate between these soils. It has the following profile characteristics:

0 to 6 inches, light-gray loamy sand or sand
6 to 32 inches, light grayish-yellow mellow very friable loamy sand, containing a slight increase of sandy clay in the lower parts.
32 to 42 inches, yellow friable light sandy clay, which becomes somewhat compact and shows some red or reddish-yellow mottlings in the lower part.

Included with this soil are a few spots of Norfolk sandy loam, deep phase, and Norfolk sand.

Another inclusion comprises a few areas of Norfolk loamy fine sand, totaling about 55 acres, just north of Shorter. Because of the small size of the sand particles, this included soil retains moisture fairly satisfactorily for growing crops. Yields are almost as large as those obtained on Norfolk fine sandy loam. Still another inclusion represents small areas of Norfolk gravelly loamy sand, totaling

about 50 acres, chiefly north of Pleasant Hill School along United States Highway No. 80, near Brownville No. 2 School, near Mount Zion Church, and near Mount Sheba Church. The gravel does not interfere seriously with the productivity of the soils, but it does interfere to a certain extent with cultivation.

Norfolk loamy sand covers a fairly large total area. The principal bodies are in the northern part of the county near Brownville No. 2 School, Darlington School, Little Texas, Bethel Grove Church, Brownville No. 1 School, Cloughs, New Georgia Church, Pleasant Hill School, Mount Sheba Church, Chehaw, Tuskegee, and Mount Myriat Church.

As Norfolk loamy sand has a slope in few places exceeding 3 percent, and as rain water is absorbed very rapidly, erosion is not serious. Terraces, however, are helpful in some places. The greatest drawback to this soil is its sandy and porous character, which allows rain water to percolate through it rather rapidly, removing part of the soluble plant nutrients before the plants are able to utilize them. The soil does not retain so large a supply of moisture for growing crops as is needed for large yields, even though fair to good yields are obtained under good management.

Immediately adjacent to the stream or drainage heads, some areas of this soil are very productive. Most of these areas may be recognized on the map. They receive drainage water, as well as organic and mineral plant nutrients, from the surrounding soils. These spots are used in large measure for the production of corn.

Practically all of the land has been brought into cultivation, and about 70 to 85 percent is in cultivation annually, the rest being fallowed. The principal crops are cotton, corn, and some hay crops. Normally cotton yields from one-fourth to five-eighths of a bale, corn 10 to 20 bushels, and hay ½ to 1 ton to the acre. This soil is also adapted to peanuts, early vegetables, melons, potatoes, peaches, berries, and velvetbeans.

Because of susceptibility of this soil to leaching and its low inherent productivity, large quantities of organic matter should be turned under each year, or at least in alternate years, to keep the soil at a profitable level of productivity. 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.

Norfolk loamy sand, slope phase.—Norfolk loamy sand, slope phase, is essentially the same in profile development as Norfolk loamy sand, but it differs in relief. The slope ranges from 6 to 12 percent. The surface soil is gray loose sand, the upper subsoil layer is light grayish-yellow or light brownish-yellow loamy sand, and the lower subsoil layer, at a depth of 40 to 45 inches, is yellow friable sandy clay or sandy loam.

Some small areas of Norfolk sand, slope phase, and some areas of Norfolk gravelly loamy sand, slope phase, are included. The gravelly loamy sand areas are principally in the vicinities of Golddust School and Mount Sheba Church.

Norfolk loamy sand, slope phase, is excessively drained both externally and internally. It is so porous that water percolates through it readily, and it is subject to gully erosion.

414558—44——4

This soil occurs as comparatively narrow long bodies adjacent to the streams. Only a small total area is mapped, principally near Brownville No. 2 School, Godfrey Store, Mount Sheba Church, Warriorstand, Shorter, Little Texas, and Whatley School.

Possibly 10 to 15 percent of Norfolk loamy sand, slope phase, is in cultivation. The cultivated land comprises small scattered areas selected for their more favorable relief, generally on the sloping points of the ridge projections and around the drainage heads, or extremely narrow small areas on the slopes. Most of the rest of the land is used for forestry, producing principally post oak, blackjack oak, old-field pine, and longleaf pine.

This soil is inherently infertile, owing to its highly leached condition. Soil improvements used for the small areas in cultivation should be the same as for Norfolk loamy sand.

Norfolk fine sand.—Norfolk fine sand of the southern part of the county differs from Norfolk sand of the northern part in that it is much finer in texture and is underlain at a depth of 3 to 5 feet by heavy brownish-red fine sandy clay.

It has the following profile characteristics:

0 to 10 inches, light-gray fine sand containing some organic matter.
10 to 40 inches, light brownish-yellow or grayish-yellow fine sand containing less than 10 percent of clay and fine material.
40 inches+, red or brownish-red heavy sandy clay.

Several areas of Norfolk loamy fine sand are included with Norfolk fine sand. These areas contain slightly more clay than Norfolk fine sand.

Areas of Norfolk fine sand generally occur as long comparatively narrow bodies on the ridge tops in the vicinities of Creek Stand and Warriorstand. Areas are near Liberty Hill School, St. Mark Church, Renfro Church, Swanson School, and Macon County Training School.

Norfolk fine sand occupies practically level areas that are not subject to serious erosion. On the border areas, however, where this soil grades into the Susquehanna and other soil types having heavy subsoils, erosion is more active. Norfolk fine sand is very easily tilled, and small mules or oxen are often used in its cultivation. A large part of it is farmed by Negro tenants, as the former occupants and owners have moved into the towns.

All this soil is cleared, and about 85 percent is cultivated each year, the rest being fallowed. The practice of fallowing consists in allowing weeds and some lespedeza to grow and turning them under for soil improvement. The fallowing is done every 3 to 5 years. Yields of one-fourth to five-eighths of a bale of cotton and 10 to 25 bushels of corn to the acre are normally produced when liberal applications of fertilizer are made or when a winter legume crop is grown and turned under. Even though this soil is inherently poor and is highly leached, it is very responsive to management, as the sand is fine enough to hold moisture fairly satisfactorily. Approximately 60 percent of the cultivated areas are used for the production of cotton, and the rest is used for corn and subsistence crops. Peanuts, velvetbeans, peaches, watermelons, potatoes, and early spring vegetables are well suited to this soil.

Norfolk sand.—Norfolk sand is known as gray upland sandy land. It is the most sandy soil in the country. It has the following profile:

0 to 5 inches, light-gray sand.
5 to 50 inches, light-yellow incoherent sand containing less than 10 percent of clay and silt.
50 inches+, heavy red or yellow sandy clay.

In the vicinities of Brownville Schools Nos. 1 and 2 a few areas comprising 5 to 20 acres each of Norfolk gravelly sand are included. Compared with the typical soil, this included soil is more difficult to farm, and owing to the presence of gravel it allows more rapid percolation of rain water.

Norfolk sand occurs principally in the central and northeastern parts of the county. A fairly large area is mapped. The principal bodies are near Brownville No. 1 School, Devine Church, New Georgia Church, Neils Chapel, Tuskegee, Chehaw, Society Hill, and Vaughan Mill.

Norfolk sand has a favorable relief, and for this reason it is separated on the map from the Norfolk soils that have rolling to hilly relief. The slope ranges from 2 to 6 percent. It is not subject to severe erosion, as most of the rainfall is absorbed immediately. Terracing is advisable in some locations. Farm operations are possible at any time. The soil warms early in the spring.

Between 20 and 30 percent of the land is cultivated; the rest is grown up to briers and broomsedge, together with some pines and post oaks. Part of the farmers allow the land to fallow for a period of 1 year out of every 3 to 6 years. Weeds, grasses, and some lespedeza spring up in the fallowed fields, thereby improving the soil and increasing the content of humus, which aids in the conservation of soil moisture as well as supplies plant nutrients. Lack of available moisture and plant nutrients are limiting factors in the production of crops on this soil. Some type of organic matter in the form of either native weeds or grasses or winter or summer cover crops are indispensable for profitably farming this soil. Commercial fertilizers are beneficial, but they are not considered so economical as organic material that has been incorporated in the soil. The fertilizers give the plants vigor and increase their feeding power and root development, thereby enabling them to take up more moisture than they would otherwise.

This soil is naturally infertile and very subject to leaching, but, by adding plant nutrients as discussed above, fair yields are obtained under a careful cropping system. It is best adapted to peanuts, velvetbeans, early vegetables, early sweetpotatoes, potatoes, melons, peaches, and cotton. A rotation of cotton and peanuts is often used on this soil and is probably one of the most satisfactory rotations for it. Cotton yields from one-fifth to one-half of a bale and peanuts 20 to 25 bushels to the acre. Peanuts are seldom fertilized, as they follow cotton on land that has been heavily fertilized.

Norfolk sand, slope phase.—Norfolk sand, slope phase, is very similar to Norfolk sand, differing principally in having steeper relief and greater susceptibility to gully erosion. It is also slightly more subject to leaching than Norfolk sand. The extreme range in slope is from 6 to 20 percent, but in most places the slope is about 10 percent.

Small areas of Gilead sandy loam, slope phase; Cuthbert sandy loam, slope phase; and Gilead-Cuthbert sandy loams, eroded slope phases, too small to show on the map, are included. When all these soils occur in such close association that the different soils cannot be separated satisfactorily, they are designated Gilead-Cuthbert sandy loams, eroded slope phases.

A fairly large total area of Norfolk sand, slope phase, is mapped. The principal bodies are near Brownville No. 1 School, Franklin Station, Neils Chapel, Pleasant Hill School, Tuskegee, Chehaw, Warriorstand, Swanson School, and Renfro Church. The areas in the southern part of the county near Warriorstand are largely Norfolk fine sand, slope phase.

Only a small acreage of this soil—probably 10 percent—is in cultivation. The cultivated areas generally occupy the lower parts of the slopes, where moisture is most abundant, even though the crops in these locations suffer severely for moisture. The cultivated areas are used for general farm and truck crops, and low yields are obtained. The crops and fertilizers best adapted to this soil are the same as those mentioned for Norfolk sand. The major part of this soil is forested, principally with scrub oak and some old-field pine. It is possible to grow better timber on this soil, but at present very little effort has been made toward reforesting the area. Slash and old-field pines should make fair to good growth on it.

Cahaba loamy sand.—Cahaba loamy sand is a light-brown soil occurring on second bottoms or terraces. It is often referred to as sandy land. It generally occupies a higher position than any of the immediately surrounding soils on the second bottoms and is used in many places for building sites. It is not affected by normal overflow.

Cahaba loamy sand has the following profile characteristics:

0 to 6 inches, grayish-brown sand or loamy sand.
6 to 40 inches, brown very mellow friable loamy sand.
40 inches+, generally brown sandy loam, but the loamy sand may continue to a depth of 4 to 6 feet before grading into the brown sandy loam or sandy clay.

The total area of Cahaba loamy sand is very small. The principal bodies are near Milstead, Shorters Station, Oak Grove Church, and Tysonville and southeast of Tuskegee.

Occurring as it does in smooth, level areas, Cahaba loamy sand is not subject to erosion, but its loose sandy character allows water to percolate through it, readily leaching it of plant nutrients.

It is closely associated with the Wickham, Cahaba, and Amite fine sandy loams and generally occupies slightly higher positions than any of these soils. It is therefore used to a large extent for truck patches, though some of the land is used for general farm crops. It is best suited to crops that grow in the early spring, such as peanuts, watermelons, peaches, or velvetbeans. Fair to good yields of corn, cotton, and other farm crops may be obtained by turning under winter cover crops or by fertilizing liberally. Cotton yields from one-fourth to five-eighths of a bale and corn 8 to 20 bushels to the acre, the higher yields being obtained under especially good management. This soil responds readily to fertilization, but plant nutrients are lost readily by leaching.

Kalmia loamy fine sand.—Kalmia loamy fine sand is similar to Kalmia sand, except that the subsoil contains a little more clay. It occurs on second bottoms or terraces and has the following profile:

0 to 9 inches, yellowish-gray loamy fine sand.
9 to 32 inches, light-yellow loamy fine sand.
32 inches+, yellow friable fine sandy loam or fine sandy clay.

This soil ranges in texture from loamy very fine sand near Bethel Grove Church and Calebee Church to loamy sand near Tuskegee and Franklin Station. The dominant texture is loamy fine sand.

The total area is small. The principal areas are south of Mount Nebo School and near Macon County Training School, Franklin Station, Tuskegee, Chesson, Swanson School, Shorters Station, and Brown School. It has a level surface, warms early in the spring, and can be tilled immediately after a rain. It is subject to leaching, thereby losing a large quantity of the soluble plant nutrients.

Practically all of this soil has been cleared of its timber growth and is used for general farm crops, garden crops, and building sites. It generally occurs on higher positions than the surrounding soils of the bottoms, and it therefore provides good building sites. Cotton and corn are the major crops grown, and yields of one-fourth to five-eighths of a bale of cotton and 8 to 20 bushels of corn to the acre are produced. These yields of cotton are obtained with an application of 200 to 300 pounds of a 3–8–5 or 4–8–4 fertilizer to the acre and a side dressing of 30 to 60 pounds of nitrate of soda, and the corn yields are obtained with a side dressing of 75 to 200 pounds of nitrate of soda. In addition, this soil is well suited to the production of peanuts, melons, peaches, oats, soybeans, and cowpeas.

Incorporation of organic matter, either in the form of winter legumes, 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 grow and improve the soil. The use of winter legumes is preferred for this purpose. especially where there is a scarcity of farm land. Yields of corn following a winter cover crop are increased by 10 to 20 bushels an acre.

Kalmia sand.—Kalmia sand is an extremely sandy soil occurring on second bottoms or terraces along some of the major streams in the northwestern and western parts of the county. It is often referred to as deep sandy land. It has the following profile characteristics:

0 to 6 inches, light-gray sand.
6 to 60 inches, light grayish-yellow sand that is very highly leached. In some places a small quanity of clay may be reached at a depth of about 42 inches, but this is not representative of the soil.

A few areas of Kalmia gravelly sand are included with Kalmia sand on the map. These areas, totaling approximately 100 acres, are near Tuskegee and Chehaw.

Kalmia sand covers a small total area, principally near Cloughs, Franklin Station, Hornady, Tuskegee, Chehaw, Mount Pleasant Church, and Kelley Store.

All the land is open, and it is used for building sites, general farm and truck crops, and pasture, though not well adapted to the latter purpose. Bermuda grass, hop clover, and lespedeza constitute the principal grazing plants.

This soil is probably best suited to the production of peanuts, peaches, blackberries, velvetbeans, early sweetpotatoes, early vegetables, and oats. Cotton and corn may be grown, but yields are normally low. Incorporation of organic matter, either in the form of winter or summer cover crops, is very beneficial. This is especially true when corn or cotton are to be grown.

SOILS WITH SHALLOW SANDY SURFACE SOILS AND YELLOW OR REDDISH-BROWN COMPACT SUBSOILS

Soils with shallow sandy surface soils and yellow or reddish-brown compact subsoils cover 6.2 percent of the area of the county. The shallow sandy surface soils rest directly on compact sandy clay or clay subsoils; consequently they are droughty for summer-growing crops and are used largely for the production of cotton. They are best suited to crops that grow mainly during the spring when moisture is plentiful, such as oats and winter legumes.

The soils of the uplands in this group range from gray to brown and are Gilead sandy loam, eroded phase; Chesterfield sandy loam; and Cuthbert sandy loam, eroded phase. These soils occur on billowy to gently rolling relief and are not well suited to the use of power machinery. They have undergone severe sheet erosion and are subject to more detrimental erosion. The heavy character of the subsoil, together with the billowy to gently rolling relief, is responsible for the susceptibility of these soils to erosion.

The soils of this group that occur on terraces range from gray to brown and are Altavista fine sandy loam; Wickham fine sandy loam, thin surface soil phase; and Flint fine sandy loam, eroded phase. The latter soil occurs as narrow belts on gentle escarpments, whereas the other soils of this group occur in broad, level fields on which power machinery may be used satisfactorily.

Gilead sandy loam, eroded phase.—Gilead sandy loam, eroded phase, is recognized by its shallow gray surface soil and heavy compact yellow sandy clay subsoil, which is exposed on the surface in many places as a result of sheet erosion. This soil is closely related to Chesterfield sandy loam, but the materials have been reworked in geologic time and redeposited. It lies near the border of the Piedmont Plateau.

The profile characteristics are as follows:

0 to 5 inches, light-gray loamy sand containing scattered quartz gravel.
5 to 15 inches, light brownish-yellow compact sandy clay, very firmly bedded but friable when removed. Some mica flakes are present.
15 to 28 inches, yellow compact clay mottled or streaked with brownish-red and some gray. This layer also contains some mica flakes.
28 to 40 inches, marbled and streaked yellow, red, gray, and brown compact clay containing some small flakes of mica and some red and purplish mottlings in places. This is underlain by streaks or strata of varicolored heavy clay and sand.

The sand particles throughout the soil are sharp and very gritty. A few very small areas of this soil have a surface layer as much as 6 to 18 inches thick. These areas are more productive than the soil as a whole. There are also included a few small areas of Cuthbert sandy loam, eroded phase, which have a brown or reddish-brown subsoil. Another inclusion represents a few acres of Gilead gravelly

sandy loam. This inclusion differs from the normal soil in having rounded gravel strewn over the surface.

Gilead sandy loam, eroded phase, occurs in the northern part of the county near Vaughan Mill, Brownville No. 2 School, Society Hill, New Georgia Church, Neils Chapel, Devine Church, Tuskegee, Mount Zion Church, and Mount Myriat Church.

The relief of this soil is choppy, billowy, undulating, and gently rolling, but the slope in few places exceeds 6 percent. The irregularities of the surface features of this soil make it very difficult to terrace. In addition, the heavy character of the subsoil retards the percolation of water, thus necessitating high terraces so as to impound water for absorption. Only a small proportion of the soil is terraced.

Probably 85 percent of the land has at one time been in cultivation. Erosion was very rapid, and yields have dropped year after year until at least one-third of the land has reverted to range land, pasture, or forest. Because of the very shallow surface soil and the heavy, compact subsoil, this soil under present cultural methods is droughty for general farm crops. The cultivated areas are used principally for cotton and some cowpeas. The soil is best suited or adapted to crops that grow during periods of high rainfall, such as oats and winter cover crops, or to cotton, which is better able to withstand droughty conditions than most general farm crops, particularly corn. Although it is better suited to cotton than corn, yields of either crop are normally low. Cotton returns from one-fifth to one-half of a bale an acre under good management. Yields of corn seldom exceed 10 bushels an acre. Oats and winter cover crops make satisfactory growth 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 treatment will aid in the conservation of moisture, which is very necessary for the production of crops on this soil, as well as supply the plant nutrients.

Chesterfield sandy loam.—Chesterfield sandy loam is a yellow soil having a shallow sandy surface soil and a heavy subsoil. It occurs as a border soil between the Piedmont Plateau and the Coastal Plain. The subsoil and underlying material is developed in place from granites and granite schist of the Piedmont Plateau, whereas the surface soil is largely a sandy Coastal Plain deposit.

It has the following profile characteristics:

0 to 5 inches, grayish-brown coarse loamy sand containing an abundance of angular stones and small water-worn gravel.

5 to 9 inches, brownish-yellow firmly bedded sandy clay having dark streaks of infiltrated organic matter.

9 to 27 inches, light brownish-yellow compact clay mottled with brownish red, rusty brown, and some light gray. It breaks into irregular-shaped cubes having colloidal-coated sides.

27 to 42 inches, yellowish-brown compact clay highly mottled with brownish red, yellow, and rusty brown. The mottlings resemble strata of decomposed rocks intermingled with heavy clays.

42 inches +, material similar to the above but containing more gray and more partly weathered parent material and small flakes of mica.

This soil grades into Gilead sandy loam and in places includes small areas of it. In land use, soil color, and response to management, these soils are similar, and both have shallow sandy surface soils and yellow compact subsoils.

A small total area is mapped, chiefly in the northern part of the county. The largest bodies are west of Bethlehem Church and near Armstrong School, Antioch Church, Mount Zion Church, Notasulga, and Vaughan Mill.

The slope generally ranges from 2 to 6 percent, and the soil is well drained externally. Even though this soil has a fairly favorable relief, such uneven surface features as knobs and knolls, short steep slopes, and long gradual slopes make it difficult to construct or maintain terraces in most places. Rapid runoff of surface waters, which cannot readily be absorbed by the slowly pervious subsoil, presents difficulties in the maintenance of this soil. In terracing this soil it is necessary to build the terraces high enough to impound the water until it can be absorbed gradually or evaporated.

Probably 60 percent of this soil is used for the production of general farm crops, and most of the rest is idle or range land. Farming is generally done in patches to avoid the more severely eroded places, and cotton and cowpeas are the principal crops grown. Cotton yields from one-fifth to one-half of a bale and hay from ⅓ to 1 ton an acre under current management. This soil is best suited to the production of oats, winter cover crops, and cotton.

To improve this soil, strong terraces should be built, deep plowing should be resorted to, and organic matter should be turned under. This practice conserves moisture as well as supplies nutrients for plant growth.

Cuthbert sandy loam, eroded phase.—Cuthbert sandy loam, eroded phase, is closely related to and associated with Susquehanna fine sandy loam and Gilead sandy loam, eroded phase. It differs from the Gilead soil principally in color, as both have compact subsoils compared with the Susquehanna soil. Cuthbert sandy loam, eroded phase, is more highly oxidized and more compact but less plastic. It has the following profile characteristics:

0 to 4 inches, gray or light yellowish-gray loamy sand.

4 to 36 inches, reddish-brown or brownish-red clay containing some sand particles. This layer is very compact and hard in place, but when removed it is fairly easily broken down. Some mica is present, giving the material a slick feel.

36 inches+, yellowish-brown compact clay containing some yellowish-gray and red mottlings. This layer is compact and more plastic than the one above. Some mica is present. The gray and yellow colorations increase with depth.

In many places this soil is so closely associated with Gilead sandy loam, eroded phase, that a separation could not be made between them. This is particularly true in the northwestern part of the county. In some areas this soil grades into and includes small areas of Susquehanna very fine sandy loam.

Another inclusion having a highly micaceous subsoil occurs 1½ miles north of Notasulga, three-fourths of a mile northeast of Armstrong, and 1½ miles north of Oak Grove Church. These areas resemble Shubuta sandy loam in surface appearance, land use, and response to management.

This is a fairly extensive soil. The largest areas are near Vaughan Mill, Brownville No. 2 School, Liberty Hill School, Spring Hill Church, Pisgah School, Simmons School, Sweet Kingdom Church, Nebraska Church, Concord Church, St. Mark Church, Danners

Chapel, Mount Sheba Church, Chehaw, McCrey Chapel, Armstrong School, Creek Stand, and Renfro Church.

The surface of this soil is choppy, undulating, and gently rolling, presenting a very irregular appearance, even though the slope ranges from only 3 to 7 percent. The irregularities of the surface features make it very difficult to establish effective terraces, and the heavy character of the subsoil retards the percolation of water, thus necessitating extremely high terraces so as to impound water for absorption. Only a small proportion of the land is terraced.

Probably 80 percent of the land has been cleared for cultivation, and probably one-third of that once cleared has now reverted to forest and range land. The forest growth is principally old-field pine and post and blackjack oaks. Lespedeza and carpet grass supply most of the grazing, and their growth is limited to the more rainy seasons.

Since Cuthbert sandy loam, eroded phase, has a very shallow surface soil and a heavy compact subsoil, which lies directly beneath the surface soil, it is very droughty under present cultural methods and is not well suited and adapted to crops that grow during periods of light rainfall. Oats, winter cover crops, or cotton, which are better able to withstand droughty conditions, do better on this soil than general farm crops, particularly corn. The soil is much better suited to cotton than corn, but yields of both crops are normally low. Cotton yields of one-fifth to one-half of a bale an acre are normally obtained, and less than 10 bushels of corn to the acre is produced. Cotton sheds its fruit badly during dry periods as the result of insufficient moisture. Fair yields of oats and winter cover crops are obtained 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 treatment will help to conserve moisture, which is very necessary for crop production on this soil, as well as supply plant nutrients.

Altavista fine sandy loam.—Altavista fine sandy loam is closely associated with and similar to Wickham fine sandy loam, thin surface soil phase, and differs from it principally in the color of the surface soil and subsoil. It has a yellow subsoil, whereas the Wickham has a reddish-brown subsoil.

Altavista fine sandy loam has the following profile characteristics:

0 to 3 inches, gray fine sandy loam.
3 to 18 inches, yellow firm smooth clay, in a few places containing small iron concretions and some small flakes of mica.
18 to 30 inches, mottled and marbled gray, yellow, and some rusty-brown smooth compact clay containing some mica scales.
30 inches+, gray compact smooth clay mottled with yellow and brown and containing some mica scales. In many places, particularly in the vicinity of Hornady, this layer is yellow micaceous friable loamy very fine sand.

Where the micaceous loamy very fine sand layer is present, the soil is a little more friable, better drained, and a little more easily managed.

A few small areas of Altavista silty clay loam south of Tysonville and a few small areas of Altavista silt loam west of Milstead are included with this soil in mapping. The silt loam areas have better

moisture conditions and are a little more productive than typical fine sandy loam.

Altavista fine sandy loam comprises a small total area. It occupies second bottoms along the Tallapoosa River, being slightly above normal overflow, although in places it is subject to overflow during extremely high waters. The larger areas are near Hornady, Franklin Station, Cloughs, Shorter, Tysonville, and Milstead.

This soil has a level or practically level surface, and surface drainage is slow. Internal drainage also is slow, but the soil is well enough drained for most crops.

Practically all of this soil is cleared and used for general crops or pasture. Probably 50 percent of the areas are used for pasture, and oats and cotton are the principal crops grown. Sorgo and hay crops are seldom grown, as they are better suited to the Congaree soils of the adjacent first bottoms. Normally cotton yields from one-fifth to one-half of a bale an acre, when the land is fertilized with 150 to 200 pounds to the acre of a 6–8–4 mixture or the equivalent, and oats yield 20 to 35 bushels when rotated with cotton and when the land is fertilized with 100 to 200 pounds of nitrate of soda as a top dressing in the spring. Carpet grass, lespedeza, Dallis grass, Bermuda grass, and hop clover constitute most of the pasture vegetation. The grasses are seriously affected by dry summer periods. This is also true of general farm crops, particularly corn.

Wickham fine sandy loam, thin surface soil phase.—This soil is similar to Wickham fine sandy loam except for its shallower surface soil, which ranges from 1½ to 3½ inches in thickness. This thin surface soil is the result of local surface wash or, more likely, of extremely high overflows from the river sweeping off much of the original fine sandy loam surface soil. This soil is not subject to destructive overflows during the growing season, and part of it is never overflowed.

It has the following profile characteristics:

0 to 3 inches, brownish-gray fine sandy loam containing some fine mica flakes
3 to 26 inches, reddish-brown compact smooth micaceous clay that takes a high polish.
26 to 36 inches, light yellowish-brown micaceous loamy fine sand containing a large quantity of coarse sand and some small gravel.

In many places this sandy condition is not developed, but the subsoil continues downward as grayish-yellow compact micaceous clay intensely mottled with brown, gray, and yellow. Included with this soil are a few small areas of a dark-colored soil that contains more organic matter than this soil normally does. These areas are not particularly different from Wickham fine sandy loam, thin surface soil phase, in land use and response to management.

The surface of this soil is practically level, and power machinery can be used on it. It occurs on the second bottoms or terraces along the Tallapoosa River and Eufaupee Creek, paralleling in a general way the courses of these streams.

A small total area is mapped, chiefly near Cloughs, Franklin Station, Hornady, Pleasant Grove Church, Chehaw, Tysonville, and Milstead.

Practically all of this soil has been cleared. Probably 60 percent of it is used for pasture, which produces lespedeza, carpet grass, yellow

hop clover, and some Dallis grass. The rest is used for the production of oats and cotton. The shallow surface soil, together with the firm compact subsoil, causes the land to be droughty, under present cultural methods, for crops that grow during the summer. Cotton yields from one-fifth to one-half of a bale an acre when the land is fertilized with 200 to 400 pounds to the acre of 4–8–4 or 3–8–5 fertilizer and side-dressed with 50 to 75 pounds of nitrate of soda. Moisture becomes a limiting factor in the production of this crop, and the cotton may drop part of its fruit during dry periods in summer. On the other hand, oats are especially well suited to this soil, and acre yields of 20 to 35 bushels are obtained when oats are grown in rotation with cotton and when the land is fertilized with 150 to 225 pounds to the acre of nitrate of soda or its equivalent.

It is possible that the greatest need in this soil to overcome the droughty conditions is deep plowing and the turning under of green-manure crops that have been liberally fertilized with phosphate or basic slag.

Flint fine sandy loam, eroded phase.—Flint fine sandy loam, eroded phase, has structural characteristics similar to those of other Flint soils in the county, but it is redder and more subject to sheet erosion. It occurs on second bottoms and has a shallow surface soil and a compact reddish-brown subsoil. It has the following profile characteristics:

0 to 3 inches, light-brown or grayish-brown friable fine sandy loam.
3 to 18 inches, reddish-brown compact firm clay containing some mica.
18 to 32 inches, brown or reddish-brown compact clay intensely mottled with yellow and gray. The gray increases with depth.

The total area is very small. Most of the soil occurs in small circular or narrow elongated bodies in the southwestern part of the county; in the vicinities of Chesson, Shorter, and Mount Pleasant Church (in the eastern part of county); south of Calebee Church; and south of Tysonville.

Even though this soil occurs on second bottoms, it is very subject to erosion and much washing has taken place. It generally occurs on narrow slopes or escarpments surrounding other soils. It should be terraced if it is to be used as an agricultural soil.

The compact character of this soil, together with its severely eroded condition, restricts its crop adaptation. These conditions make it droughty for corn and other crops that mature during the summer. The cotton crop is often cut short by dry weather, even though yields under good management in favorable years range from one-sixth to one-half of a bale an acre. This soil is best suited, under present cultural methods, to the production of oats, winter cover crops, cotton, and velvetbeans. The essentials for its improvement are well-constructed terraces and a heavy application of phosphate followed by a legume crop to be turned under. This treatment will aid in conserving the moisture as well as supply plant nutrients.

POORLY DRAINED SOILS OF THE FIRST AND SECOND BOTTOMS

Poorly drained soils of the first and second bottoms are extensive, covering 24.2 percent of the area of the county. In their native condition they are either insufficiently drained or subject to frequent

overflow, thus handicapping their utilization for farming purposes. They are variable in character, ranging from heavy clays to riverwash sands. They are used principally for forestry and pasture, although some areas have been cleared and drained and are utilized for the production of corn, sorgo, soybeans, and some cotton. Carpet grass does unusually well on these soils when the forest is removed. In the wooded areas cattle feed considerably on cane, gray moss, and underbrush during the winter, making these soils desirable for winter grazing. If any change in economic conditions should warrant greater production of crops, more of these soils can be drained by ditches and brought into profitable cultivation for farm crops.

This group comprises Roanoke silt loam, Myatt fine sandy loam, Iuka silt loam, Kaufman clay, Bibb silt loam, Bibb fine sandy loam, alluvial soils, undifferentiated, swamp, and riverwash.

Management of the cultivable soils in this group is discussed under Land Uses and Agricultural Methods (p. 73).

Roanoke silt loam.—Roanoke silt loam is associated with the Wickham, Altavista, and Augusta soils and occurs on low terraces or second bottoms along the Tallapoosa River. It is the poorest drained member of this group. Although it lies above the level of normal overflow, part of it is subject to overflow during extremely high water.

The following profile is characteristic of Roanoke silt loam:

0 to 5 inches, gray silt loam containing enough organic matter to give the material a dark coloration, especially when wet.
5 to 12 inches, light-gray silty clay with some rust-brown mottlings. A few soft iron concretions are present in places.
12 to 30 inches, gray silty clay intensely mottled with yellow and a small amount of brown.
30 inches+, gray compact firm silt clay mottled with rusty brown and yellow and containing a few decomposed iron concretions.

Near the northwestern corner of the county and north of Eufaupee Creek a mixed soil that possesses some characteristics of Roanoke silt loam is included. This area includes small spots having a gray shallow surface soil and a heavy compact yellow subsoil, which becomes intensely mottled at a depth of 10 to 12 inches; also a few dark brownish-gray or almost black spots, where organic matter has accumulated. This area is used principally for the production of cowpeas, sorgo, soybeans, and some corn.

Roanoke silt loam is not an extensive soil. The larger areas are near Milstead, Shorters Station, Tysonville, and Franklin Station. It is poorly drained as a result of its low position and the slowly pervious character of the subsoil.

This soil is used principally for pasture, very commonly growing up to sweetgum bushes, briers, and vines. Carpet grass supplies the major part of the grazing. Some areas may be artificially drained and used for sorgo, soybeans, or lespedeza. A fertilizer high in phosphate and potash should be very helpful for these crops. The pasturage can be improved by removing the bushes and briers, by providing artificial drainage, which is urgently needed in many places, by applying basic slag at the rate of 300 to 600 pounds to the acre, and by introducing lespedeza, Dallis grass, and hop clover.

Myatt fine sandy loam.—Myatt fine sandy loam is recognized as being among the poorest drained soils of the county. It occurs on

second bottoms or low terraces and is waterlogged and 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.
6 to 24 inches, light-gray loamy fine sand containing a few faintly conspicuous brown and yellow splotches.
24 to 36 inches, gray fine sandy clay mottled with yellow and some brown. This layer is slightly sticky but fairly friable.
36 inches+, rather 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 out until late in the season.

Included with this soil are a few small areas of Leaf fine sandy loam, poorly drained phase, in which a heavy plastic gray clay subsoil is present at a depth of 15 to 20 inches. Several small areas occurring in swales and depressions of the uplands are included with this classification. These inclusions have essentially the same land use as Myatt fine sandy loam.

Myatt fine sandy loam is fairly extensive, but only a small part of it is used agriculturally. The larger areas are near Nebraska Church, Mount Andrew Church, Pleasant Grove Church, Swanson School, Warriorstand, Milstead, Chesson, Chehaw, and Little Texas and south of Shorter.

Probably less than 5 percent of the land is cleared and used for crops and pasture; the rest is used for forestry. The principal trees are sweetgum, water oak, post oak, black oak, and a few old-field pins. The cultivated areas are used largely for the production of sorgo, soybeans, cowpeas, and corn, and with proper drainage fair yields of these crops are produced. This is particularly true in the vicinity of Mount Andrew Church and in other scattered locations, where several large areas have been brought into cultivation. Cotton is often grown on the better drained parts, and fair yields are obtained in dry seasons.

More areas of this soil can be reclaimed and put into cultivation by the construction of deep drainage ditches. This is particularly true of the small areas. The cultivated areas normally produce from 15 to 30 bushels of corn to the acre, and on the better drained areas where cotton is grown the yield normally ranges from one-third to two-thirds of a bale an acre. Cornland is seldom fertilized, whereas cotton land is generally fertilized with 200 to 400 pounds of 4–8–4 or 3–8–5 to the acre and side-dressed with nitrate of soda. Where drainage is fairly well established, this soil is suited to the production of sorgo, soybeans, cowpeas, carpet grass, and possibly lespedeza.

Iuka silt loam.—Iuka silt loam is intermediate in drainage between the Ochlockonee and Bibb soils. It has a surface soil similar to that of the Ochlockonee and a subsoil similar to that of the Bibb. The surface soil, to a depth of 10 to 12 inches, is brown silt loam containing a considerable amount of organic matter in the upper 3 or 4 inches. This grades into a gray silty clay containing some yellow and brown mottlings. This material is rather sticky and plastic when wet.

This soil occurs along the major streams of the central and southern parts of the county and is subject to frequent overflows during the

winter and may overflow during any rainy spell during the summer. It is not extensive. The larger areas are near Brown School, Mount Andrew Church, and Liverpool, and southeast of Tuskegee.

As this soil is subject to hazardous overflow, only a few small parts of it are used for crops. The land is used principally for forestry and pasture. Willow, sweetgum, swamp tupelo, hawthorn, hickory, water oak, ironwood, magnolia, bay, sycamore, and a few old-field pines are the principal trees. Such vegetation as southern cane (river cane), gray moss, briers, and other underbrush constitute the principal grazing; and in the open areas carpet grass, Dallis grass, Bermuda grass, and lespedeza supply considerable grazing. The cultivated areas are used largely for the production of sorgo, corn, soybeans, and cowpeas. Good yields are obtained, and very little or no fertilization is used for any of these crops.

Kaufman clay.—Kaufman clay is the overflow soil of the true Black Belt and is composed principally of material recently washed from the Houston, Sumter, and associated acid clay soils and deposited in the first bottoms along the streams. It is subject to frequent overflow during the winter and to hazardous overflow during the spring and summer.

Kaufman clay has the following profile characteristics:

0 to 5 inches, dark grayish-brown silty clay having a green cast. When moist or wet this material is plastic and appears black.
5 to 14 inches, dark grayish-brown plastic clay mottled with dark rusty brown in the lower part. In a moist condition it appears black.
14 to 36 inches, light-gray plastic clay, intensely mottled and marbled with brownish yellow and grayish yellow.
36 inches+, light grayish-yellow heavy clay containing mottles of light gray and brown.
This material rests on the underlying chalk at a depth of 40 to 60 inches.

At the mouth of Line Creek there is included with Kaufman clay an area that is a mixture of Ochlockonee silt loam and recently deposited sand. All this area is devoted to corn, and yields of 10 to 30 bushels an acre are obtained. Like typical Kaufman clay, this included soil is subject to overflow and may be overflowed during the summer, with destruction of growing crops.

Kaufman clay occurs along practically all the streams that flow out of the Black Belt. It covers a fairly large total area. The principal bodies are near Swanson School, Chesson, Hardaway, Downs, Bunkey Chapel, St. Mark Church, St. Paul School, and Macon County Training School and south of Mount Nebo School.

Probably 5 percent of this soil is used for cultivated crops; the rest is used for range, pasture, or forest. The principal trees are ash, willow, beech, birch, sycamore, white oak, water oak, maple, magnolia, bay, and elm. In addition, river canes, briers, grasses, underbrush, and gray moss supply considerable grazing. Some cleared areas are used for pasture and support Dallis grass, lespedeza, white clover, hop clover, and carpet grass. The areas in cultivation are used largely for corn and hay crops. Normally corn yields from 20 to 40 bushels and hay 1 to 2 tons an acre. More of this soil would be cleared for cultivation if it were not subject to hazardous overflow. The major part is overflowed as many as six times annually, principally during the winter. By opening, straightening, and deepening the drainage channels, more of this soil can be used for corn and hay land or pasture.

Bibb silt loam.—Bibb silt loam, a gray poorly drained soil, occurring along the smaller streams in the county, is subject to overflow, particularly during the winter and spring. Drainage is poor except where artificially improved. This soil has the following profile characteristics:

0 to 4 inches, gray silt loam containing enough organic matter to give it a dark color.
4 to 30 inches, gray silty clay containing some splotches and mottlings of yellow and brown. This material is slightly sticky when wet, but it is fairly friable under favorable moisture conditions.
30 inches+, material very similar to the above, except that it is slightly heavier and a little more sticky.

Included are a few areas that are silty clay loam in texture, being slightly heavier than normal.

This is an extensive soil, occurring in the southern and southwestern parts of the county. The larger areas are near Tuskegee Institute Farm, Mount Pleasant Church, Milstead, Chesson, Fort Hull Church, Nebraska Church, Liverpool, Hardaway, Downs, Macon County Training School, and Brown School, and south of Devine Church.

Probably less than 5 percent of the land is in cultivation; the rest is range land or is forested with sweetgum, black gum, hickory, birch, willow, beech, American beautyberry (French mulberry), magnolia, water oak, sycamore, and old-field pine. Such vegetation as river cane, gray moss, briers, and underbrush (in the wooded areas) and carpet grass, Bermuda grass, lespedeza and Dallis grass (in the open areas) supply considerable grazing. The principal cultivated areas are used for corn, sorgo, and hay crops. It is well suited to these crops where not too subject to overflow. Under present economic conditions it is not likely that a very extensive acreage of this soil will be cleared and put into cultivation. Should circumstances warrant, much of it could be profitably utilized by establishing drainage ditches and straightening and deepening the stream channels.

Bibb fine sandy loam.—Bibb fine sandy loam, a gray poorly drained soil, occurs along some of the streams where it is subject to overflow several times during the winter and at any time during the summer. It has the following profile characteristics:

0 to 5 inches, gray fine sandy loam containing some organic matter.
5 to 15 inches, light-gray friable fine sandy clay containing some faint splotches of yellow and brown.
15 to 40 inches, gray heavy fine sandy clay mottled with some yellow and brown.

Included with this soil are a few areas of Iuka fine sandy loam and Ochlockonee fine sandy loam. The latter areas lie adjacent to the stream channels and are more sandy and better drained. These included areas are a little better drained than the typical areas, but they are subject to hazardous overflow.

Although not so extensive as the silt loam, Bibb fine sandy loam covers a fairly large area, chiefly in the southern and central parts of the county. The larger bodies are near Boromville, Tuskegee Institute Farm, St. Paul Church, Warriorstand, Mount Myriat Church, Shiloh Church, Nebraska Church, and Pisgah School, and south of Shorter.

Potentially, Bibb fine sandy loam is capable of producing fair to good yields of corn, sorgo, sugarcane, soybeans, cowpeas, and velvetbeans with little fertilization, but the hazard of overflow during the summer, together with the expense of clearing and draining this soil, has caused most of it to be left in forest and range land. Approximately 5 percent has been put into cultivation and used for the crops mentioned. The more extensively cultivated areas are near Mount Andrew Church, Tuskegee Institute Farm, and Fort Hull Church. Corn yields without fertilization range from 15 to 30 bushels an acre. Very little is known about fertilizer requirements for this soil, but it is possible that a small quantity of phosphate and potash would be beneficial to summer legumes and a small quantity of a complete fertilizer would be beneficial to corn and sorgo.

The forested areas, which comprise the major part, are producing sweetgum, swamp tupelo, black tupelo, willow, hawthorn, hickory, water oak, magnolia bay, sycamore, and a few old-field pines. In the forested areas, cattle browse on river cane, gray moss, briers, and underbrush. Several areas have been cleared and used for pasture. Carpet grass supplies most of the grazing, although some Dallis grass, Bermuda grass, lespedeza, and in some places hop clover, afford considerable grazing.

Alluvial soils, undifferentiated.—This classification represents a heterogeneous mixture of materials deposited by recent overflow of streams. In the sandy northern part of the county these soils consist largely of sands and loamy sand; in the heavy clay districts, particularly in the Susquehanna soil belt in the southern part, they are dominantly clay loam and sandy clay. The character of these soils is subject to change from time to time as new material is brought in and deposited or removed with each overflow.

These undifferentiated soils border the streams throughout the county and comprise a very large total area. The larger bodies are near Brownville No. 2 School, Little Texas, Society Hill, Hornady, Golddust School, Sweet Kingdom Church, Mount Andrew Church, Mount Sheba Church, Concord Church, Warriorstand, and Swanson School.

In the northern part of the county and elsewhere where the surrounding hills are dominantly sand, loamy sand, and sandy loam, a very small part of the land has been brought into cultivation. The limited extent of cultivation is due to the sandy character of the material, regularity of overflow, and rapid runoff as the result of the extremely broken relief of the surrounding soils. Around some of the drainage heads ½- to 2-acre areas of these soils have been brought into cultivation. They are used largely for the production of corn, sorgo, and hay crops and are returning good yields of these crops with no fertilization. A few small gardens and truck patches have been established along the outer edges of some of the soil belts. The major areas are used for forestry. The principal trees are sweetgum, bay, and swamp tupelo.

In the main, drainage ditches would be difficult and impracticable in the reclamation of this soil, as the ditches would fill with each rain, necessitating much labor in their maintenance.

In the southern part of the county, in association with the surrounding Susquehanna soils, probably as much as 10 percent of this soil has been reclaimed for cultivation. The cultivated areas are

used largely for corn, sorgo, and hay crops; and other areas, cleared for pasture, support a cover of carpet grass, lespedeza, and Dallis grass. Large yields of these crops are obtained, and more of these areas can be cleared should the necessity for more cornland and hayland arise. The uncultivated areas in this locality are used largely as range land and forest, producing mainly river cane, gray moss, sweetgum, black gum, water oak, post oak, ash, beech, birch, and other species of trees. These areas are easier to drain than those in the northern part of the county, as the drainage ditches do not fill so rapidly and the banks are less subject to caving.

Swamp.—Swamp is a classification given to materials in the sloughs or bayous representing remnants of old river channels. At present they serve as overflow channels during high water, remain covered with water during the winter, and continue more or less wet during the summer. The surface soil of swamp, to a depth of 6 to 18 inches, is dark-gray or almost black silt loam or silty clay loam having developed in large measure from decayed organic material under wet conditions. This grades into black sticky clay.

The total area is very small. Most of the bodies are near Hornady, Franklin Station, Shorters Station, and Milstead.

None of this soil is being utilized for crops or pastures, but it is producing water-loving vegetation, principally cypress, sweetgum, swamp tupelo, willow, maple, birch, and some beech. The best of this soil is used for forestry. Wild ducks feed in the swamp areas during the day, although very little effort is made to encourage this use.

Riverwash.—Riverwash, as the name implies, is nothing more than sand and gravel deposited by streams during overflows. The material is shifted and reworked during high stages of the streams.

No vegetation, except some willow and birch, grows on this land; consequently it has very little economic importance other than for road-building materials.

The total area is very small. Most of the small bodies occur on the insides of sharp bends adjacent to the stream channel. The principal areas are near Tysonville, along the Tallapoosa River, and along Eufaupee Creek, especially near Simmons School, Franklin Station, Cloughs, Chehaw, and Tuskegee.

SOILS OF ERODED AND SLOPING AREAS AND STEEP HILLY LAND

Soils of eroded and sloping areas and steep hilly land comprise 22.1 percent of the area of the county. They are all severely sloping to hilly and are much mixed in character. In the main they have shallow surface soils and compact to plastic heavy clay subsoils ranging from yellow to red. They are very subject to erosion, especially the few areas that have been brought into cultivation. Considerable erosion has also taken place in the forested areas, especially where the leafmold and forest litter are burned annually or every few years. This land is used principally for forest and range land, supporting a second growth, largely of old-field pines, post oak, blackjack oak, and sweetgum.

The members of this group are Gilead sandy loam, eroded slope phase; Chesterfield sandy loam, eroded slope phase; Cuthbert sandy

414558—44——5

loam, eroded slope phase; Gilead-Cuthbert sandy loams, eroded slope phases; Susquehanna clay, slope phase; Oktibbeha clay, slope phase; Cecil sandy loam, eroded hilly phase; Vaiden-Susquehanna clays; Vaiden-Susquehanna clays, steep phases; and steep hilly land (Gilead-Cuthbert soil materials).

Where the land is cultivated, the recommendations for fertilizer and crops given under Land Uses and Agricultural Methods (p. 73) are applicable.

Gilead sandy loam, eroded slope phase.—This soil is very similar to Gilead sandy loam, differing from it principally in that it occurs on slopes of 6 to 12 percent where much soil has been lost as a result of severe sheet and gully erosion. The surface soil, to a depth of 2 to 5 inches, is brownish-gray or light-gray loamy sand. This rests abruptly on compact yellow sandy clay that is mottled with some brown, red, and gray at a depth of 20 to 30 inches. Finely divided mica flakes are present in the subsoil and substratum. In many places, particularly in the northwestern part of the county, this soil and Cuthbert sandy loam, eroded slope phase, occur in such close association that a satisfactory boundary could not be drawn between them. The structural characteristics of these soils and the land use of each is approximately the same. The Cuthbert is red or reddish brown, whereas the Gilead is yellow.

This is an extensive soil. The larger areas are in the vicinities of Vaughan Mill, Brownville No. 2 School, Little Texas, Golddust School, Simmons School, Bethel Grove Church, Brownville No. 1 School, Society Hill, Devine Church, Neils Chapel, Mount Sheba Church, Concord Church, Tuskegee, McCrey Chapel, and Mount Myriat Church. Other areas are scattered over the county, principally in the northern and central parts.

As this soil has a sloping to hilly surface and a very compact subsoil that affords slow percolation of water, it is subject to severe sheet and gully erosion, consequently a large part of the land once brought into cultivation is now idle or has reverted to forestry. The construction and maintenance of terraces on this soil are very difficult and in many places impracticable.

Probably 90 percent of this soil is in forest, principally of old-field pines, a pine locally called rosemary pine, sweetgum, black gum, post oak, blackjack oak, dogwood, and some black oak. Most of the cultivated areas, which are small fields, have not been sufficiently terraced; therefore they have been almost destroyed for farming by erosion. Erosion is also active in the forested areas. The principal areas in cultivation are near the trading centers, largely near Tuskegee. Cotton, some oats, and less corn are grown. Yields are very low. Except on some of the more gentle slopes and small 1- to 2-acre fields, this soil is best utilized for forestry. Like Gilead sandy loam, it is droughty for crops, particularly those grown during the summer.

Chesterfield sandy loam, eroded slope phase.—This soil differs from Chesterfield sandy loam in that it has a steeper slope—6 to 15 percent—and in many places has large granitic rock outcrops. The surface soil is largely a deposit of Coastal Plains sand over yellow clay derived from the weathered material from granitic rocks.

In general this soil has the following profile characteristics:

0 to 3 inches, brownish-gray coarse loamy sand and some rounded gravel.
3 to 24 inches, light brownish-yellow firmly bedded compact clay containing sharp angular sand particles and small flakes of mica, giving it a gritty feel. This material is mottled with yellowish brown and some light gray.
24 inches+, brownish-yellow compact sandy clay containing weathered rock fragments and some mica flakes.

The underlying parent rocks, granite and granite schists, generally are at a depth ranging from 2½ to 7 feet, but in many places large rock outcrops are in evidence.

A few very small areas of Bradley sandy loam, a red soil, are included in this separation. Also, a few areas having a slope of 25 to 40 percent are included. These areas are principally west of Notasulga.

This is not an extensive soil. The principal areas are near Notasulga, Antioch Church, Mount Zion Church, Armstrong School, Bethlehem Church, and Salem Church.

As this soil has an unfavorable relief, contains many stones and boulders on the surface and in the subsoil, and is rather droughty for crops because the compact heavy clay subsoil is so near the surface, it is best used for forestry. The principal trees are old-field pine, rosemary pine, post oak, black oak, and sweetgum. Less than 5 percent of the land is in cultivation, principally to cotton, yields of which are usually low, ranging from one-fifth to one-half of a bale an acre on the more select spots. Oats and winter cover crops may be grown satisfactorily. Fertilization should be the same as on Chesterfield sandy loam.

Cuthbert sandy loam, eroded slope phase.—Cuthbert sandy loam, eroded slope phase, in soil profile characteristics is somewhat similar to Cuthbert sandy loam, differing from that soil principally in its steeper relief and less uniform subsoil. It has a slope of 6 to 12 percent.

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

This soil and Gilead sandy loam, eroded slope phase, are very closely associated, and in many places areas of the Gilead soils are included, particularly in the northwestern part of the county near Woodland Church and Simmons School. A few small areas of Susquehanna fine sandy loam are also included. North of Oak Grove Church some bodies having a highly micaceous subsoil are included. Most of these included areas are forested.

Cuthbert sandy loam, eroded slope phase, comprises a fairly large total area. The principal bodies are in the northern and central parts of the county near Vaughan Mill, Simmons School, St. Mark Church, Danners Chapel, Mount Sheba Church, Concord Church,

Pleasant Grove Church, Chehaw, Salem Church, McCrey Chapel, and Armstrong School, and west of Bethlehem Church. Other large areas are in the southern part of the county around Calebee Church and Creek Stand and south of Shorter.

Probably 90 percent of this soil is in forest, principally of old-field pine, rosemary pine, sweetgum, black gum, post oak, blackjack oak, dogwood, and some black oak. Most of the cultivated areas and small fields have not been sufficiently terraced, and erosion has destroyed a large part of the land for farming. Erosion is active also in the forested areas. The principal areas in cultivation are near the trading centers, mainly around Tuskegee. Cotton is the principal crop; some oats and a little corn are grown. Yields of all crops are very low. Except on some of the more gentle slopes and in small 1- to 2-acre fields, this soil is best used for forestry. Like Cuthbert sandy loam, eroded phase, it is droughty for crops, particularly those growing during the summer. Fertilizers and crops recommended are the same as for Cuthbert sandy loam.

Gilead-Cuthbert sandy loams, eroded slope phases.—Gilead-Cuthbert sandy loams, eroded slope phases, represent a condition of mixed soils occurring in sloping to hilly areas. The slope ranges from 7 to 15 percent. This soil complex includes bodies of Cuthbert sandy loam, Gilead sandy loam, Susquehanna fine sandy loam, and Norfolk sand, which are too intricately mixed to be satisfactorily separated on the map. Where practicable, separations were made and the various soils were classified and mapped as described in other parts of this report. Drainage is excessive, and erosion in most areas is active in spite of the forest growth, especially in the areas that are burned over annually.

The total area of this complex is fairly large. Most of it occurs in the northern part of the county. The principal areas are near Oak Grove Church, Brownville No. 1 School, New Georgia Church, Darlington School, Brownville No. 2 School, Neils Chapel, Pleasant Hill School, Mount Sheba Church, Concord Church, Tuskegee, Warriorstand; and Creek Stand, and northeast of Macon County Training School.

Except for a very few small areas in cultivation, principally to cotton, this soil is used for forestry. The principal trees are old-field pine, some rosemary pine, and longleaf pine, together with some post oak, blackjack oak, dogwood, southern red oak, hickory, and others. Most of the cultivated areas are included areas of Norfolk sand, slope phase. Adequate measures to prevent forest fires are the principal requisite for establishing timber. Seeding is necessary for producing longleaf yellow pine or slash pine. In addition these areas make good game preserves, supporting enough underbrush, nuts, beggarticks, seeds, mast, native vetch, native lespedeza. French mulberry seeds, dogwood seeds, and other seeds for quail and possibly turkeys.

Susquehanna clay, slope phase.—Susquehanna clay, slope phase, locally known as the red clay hills, differs from Susquehanna clay in that it is more rolling, more severely eroded, and more difficult to manage. It has the following profile characteristics:

0 to 4 inches, reddish-brown heavy clay that is plastic when wet. In many places the surface soil is light brown and the soil includes a 1- to 3-inch surface layer of very fine sandy loam.

4 to 18 inches, reddish-brown heavy clay that is extremely plastic when wet. The lower part of this layer is mottled with light gray and some yellow.
18 to 36 inches, yellow-red heavy plastic clay intensely mottled with gray, yellow, and some brown. The gray increases with depth.

A large total area is mapped, chiefly in the southern part of the county. The principal bodies are near Spring Hill Church, Liberty Hill School, Pisgah School, Hardaway, Liverpool, Mount Pleasant Church, Sweet Kingdom Church, Mount Andrew Church, Danners Chapel, Shiloh Church, Creek Stand, Boromville School, Brown School, Mount Myriat Church, and County Farm.

Approximately 10 percent of this soil is in cultivation, with the largest cultivated acreage in the vicinities of Hardaway and Pisgah School. Approximately 30 percent more is used for pasturage, and the rest is used for forest and range land. The cultivated areas are used principally for the production of cotton, although other crops, such as velvetbeans, sorgo, peanuts, cowpeas, and soybeans, are grown in some places. Yields of these crops are normally low. The areas used for pasture support carpet grass and lespedeza, which are native to this soil. Dallis grass, hop clover, and orchard grass may also be grown. The fertilization for the different crops and grasses on this soil are the same as for Susquehanna clay.

The unfavorable relief, together with the slowly pervious character of the subsoil, makes this soil very susceptible to erosion. It is also difficult to prepare for crops in the spring, as the optimum moisture content for satisfactory plowing extends over a very short period. It becomes hard within a short time after it is dry enough to cultivate. These conditions, together with the natural adaptation of this soil to grasses, have caused a large number of farmers to convert the use of this soil from farm crops to pasture grasses and timber, particularly to timber.

Old-field pines constitute the principal merchantable timber, as they grow very rapidly on this soil. Some rosemary pine and oaks are also grown.

Oktibbeha clay, slope phase.—Oktibbeha clay, slope phase, differs from Oktibbeha clay in that it has a steeper slope—6 to 12 percent—and has undergone very severe sheet and gully erosion. The soil profile description of Oktibbeha clay (p. 45) is applicable to this soil, except that the surface soil is slightly shallower. Included with this soil are a few areas of Vaiden clay, Susquehanna clay, slope phase, and Vaiden very fine sandy loam. These soils are very closely related to and similar to Oktibbeha clay, slope phase, and have in the main the same crop adaptations. The Oktibbeha and Vaiden soils are probably a little more responsive to management than the Susquehanna. The normal types of each of these soils is discussed in detail in other parts of this report.

Oktibbeha clay, slope phase, occurs in the southern part of the county in close association with the Black Belt or lime soils. The total area is not large. The principal bodies are near Macon County Training School, Chesson, Hardaway, Bunkey Chapel, Swanson School, and Renfro Church.

More than 90 percent of the land is used for pasture or pasture and timber. Small fields, where the relief is more gentle, are used

for oats, winter cover crops, peanuts, velvetbeans, soybeans, and cowpeas. Lespedeza, carpet grass, and some Dallis grass constitute the principal pasture plants.

The forest growth on this soil is principally old-field pine. Other trees, such as sweetgum, post oak, blackjack oak, dogwood, rosemary pine, and longleaf pine, are present, but they constitute only a small part of the forest growth. This soil is especially well suited to old-field pines, and the growth of these trees should be encouraged by keeping out forest fires and by removing all objectional trees that compete with them.

Cecil sandy loam, eroded hilly phase.—This soil has a slope of 6 to 12 percent and is limited in land use. It has the following profile characteristics:

0 to 4 inches, brown friable sandy loam, the upper inch containing considerable leafmold and litter in timbered areas.
4 to 5 inches, brown friable clay loam—a transitional layer between the surface soil and the subsoil.
5 to 40 inches, red, firm, compact, brittle clay containing a large quantity of fine mica flakes and some sharp sand particles.
40 inches +, highly decomposed granite schist rock.

This soil covers only a very small area, principally north of Notasulga, joining the Macon-Lee County line, and in the extreme northwest corner of section 36 that is almost surrounded by Lee County.

Included with this soil are a few small spots of Appling clay loam characterized by their yellow color. Another inclusion represents an area of about 30 acres in one body north of Bethlehem Church, bordering the Macon-Lee County line. It is subject to erosion, and well-constructed terraces are much needed. Practically all of this included soil is cultivated and is used chiefly for the production of cotton, although it is suited also to oats and other winter- and spring-growing crops. Moisture becomes a very limiting factor for the production of other crops grown on this soil, particularly corn. It is possible that its physical characteristics can be improved by deep plowing and by the incorporation of large quantities of organic matter.

Between 5 and 10 percent of Cecil sandy loam, eroded hilly phase, is devoted to cultivated crops, principally cotton; the rest is used for forest, consisting chiefly of old-field pine, rosemary pine, longleaf pine, and some hardwoods. The principal area of this soil in cultivation is north of Notasulga. Cultivated areas and even forested areas are very subject to erosion where not well terraced, owing to the rolling character of the land and to the dense subsoil, which retards the percolation of water.

Vaiden-Susquehanna clays.—Vaiden-Susquehanna clays constitute a soil complex consisting of areas of Vaiden clay and Susquehanna clay so intricately associated that it was impracticable to separate them on the map. This complex also includes areas of soil closely related to the Vaiden or Susquehanna soils but differ from them in having mottled red, yellow, and gray plastic clay subsoils containing a large quantity of oystershells at a depth of 24 to 36 inches. In places below a depth of 36 inches these shells are firmly cemented by iron oxide or other cementing material and have formed a hard stratum. These shell strata outcrop in many places in cuts on the steeper slopes.

The principal areas of the Vaiden-Susquehanna clays complex are near Brown School, Creek Stand, Boromville, Tuskegee Institute Farm Pisgah School, Shady Hill Church, and County Farm. The areas around County Farm, Tuskegee Institute Farm, and Shady Hill Church have a little more sand in the surface soil than does the complex as a whole. This accounts for a greater proportion of this land being in cultivation, with yields a little higher than those obtained on the complex. As this soil complex has a slope of 6 to 15 percent and a subsoil that is slowly pervious to water, it is very subject to erosion. Where the forest litter is burned regularly, erosion is also active in the wooded areas. Terraces are difficult to construct and maintain, and only a small proportion of the land is so improved. Erosion is especially active in the cultivated areas.

Approximately 10 percent of this soil complex is in cultivation; the rest is used principally for forestry and range land pasture. Most of the areas in cultivation are narrow bodies along the base of the slopes and contiguous to the drainage channels. Applications of fertilizer are generally light, and yields are correspondingly low. Cotton and corn are the principal crops grown. Cotton yields from one-fourth to one-half of a bale and corn 5 to 15 bushels an acre.

In the forested areas where the trees are sparse, carpet grass, Dallis grass, and lespedeza furnish considerable grazing. Dallis grass generally grows on the lower slopes, where some lime has been transported from the upper slopes. Old-field pine is the principal merchantable timber produced, although some return is obtained from rosemary pine, sweetgum, black oak, and southern red oak.

Vaiden-Susquehanna clays, steep phases.—This complex, known as shell land, comprises the most severely broken and hilly soils of the southeastern part of the county. It is recognized by the large quantity of shells, steep escarpments, and high knolls or ridges. The slope ranges from 20 to 80 percent. It is associated with Susquehanna clay but is more severely broken and is composed in large measure of calcareous material and partly decomposed oystershells.

The material is variable, ranging from highly weathered and decomposed oystershells and strata of cemented shells on the steeper slope, where the soil is alkaline in reaction, to yellow or greenish-yellow plastic clay overlying the shells at a depth of 2 to 4 feet, where the soil overlying the shells is acid in reaction. The latter condition is more prevalent. Some areas of Susquehanna clay, too small to show separately on the map, are included with this soil. It does not run together or puddle like the associated Susquehanna soils.

This soil complex occurs more or less continuously from a point north of Chesson, in the southwestern part of the county, to Providence Church, and along the eastern county line, where it extends into Russell County. The larger areas occur near Liverpool, Mount Andrew Church, Shady Hill Church, Creek Stand, Mount Pleasant Church, and Brown School.

Approximately 5 percent of this soil is in cultivation. The cultivated areas are principally along the lower slopes, where the calcareous shells have influenced the soil to a marked degree. These areas are fairly productive but are subject to erosion because of the steep slope. Owing to their more friable character, resulting from the lime content, however, they are not so subject to erosion as are many of the soils on similar relief. Cotton and corn are the principal crops

grown, and yields of one-fourth to one-half of a bale of cotton and 8 to 15 bushels of corn to the acre are produced. These yields are obtained when the land is fertilized with 150 to 250 pounds to the acre of a 3–8–5 or 4–8–4 fertilizer for cotton and 50 to 100 pounds of nitrate of soda for corn.

The rest of this soil is used for forest and pasture, a large part of it being range land. Old-field pine, rosemary pine, post oak, blackjack oak, black oak, and hickory are the dominant trees. Hawthorn, redbud, and possibly cedars grow on the areas where the shells and calcareous materials outcrop. Lespedeza, hop clover, and carpet grass are the more common pasture plants, and Dallis grass, black medic, and some sweetclover are prevalent on the calcareous or shell areas. The growth of these plants may be increased by an application of 200 to 400 pounds of superphosphate to the acre.

Land use recommendations for this and related soils are discussed in detail in group 10 of the section on Land Uses and Agricultural Methods (p. 73).

Steep hilly land (Gilead and Cuthbert soil materials).—This land type is similar to Gilead-Cuthbert sandy loams, eroded slope phases, and differs from that complex in that it occurs in more broken areas having a slope of 15 to 45 percent. It represents the most broken and hilly part of the county other than Vaiden-Susquehanna clays, steep phases.

It is not extensive. The principal bodies are near Warriorstand, New Georgia Church, and Simmons School.

It is used exclusively for forestry, producing old-field pine, some rosemary and longleaf pines, together with some post oak, hickory, and other trees. Adequate measures to prevent forest fires are the principal requisite for the better establishment of timber. Seeding is necessary to produce longleaf or slash pine. These areas also make good game preserves, as they produce enough underbrush, nuts, beggarticks, seeds, mast, native vetch, native lespedeza, French mulberry seeds, dogwood seeds, and other feed for raising quail and possibly turkeys.

ESTIMATED YIELDS

In table 6 the soils of Macon County are listed alphabetically, and estimated average acre yields of the principal crops are given for each soil.

The estimates in table 6 are based primarily on observations in the field, together with estimates of yields furnished by local farmers and others who have had experience in the agriculture of the county. In addition, many data obtained by the staff of the Alabama Agricultural Experiment Station were used in making these estimates. Because of a lack of specific data for all soil types, the yields are presented only as estimates. As the soils shown on the map vary slightly from place to place, practices of management differ somewhat from those indicated, and climatic conditions fluctuate from year to year, a range of yields has been shown in column A for cotton, corn, winter oats, and soybean and cowpea hay.

The figures in column A refer to yields obtained under the more common practices of management, which include the use of com-

mercial fertilizers for the cash crops. Systematic rotations including grasses and legumes are not followed and little special effort is given to erosion control. The figures in column B refer to yields obtained under the better practices of management, which include more careful and liberal fertilization, the use of legumes and cover crops in the rotation, and more intensified measures for the control of erosion.

Macon County is an area of soils that differ widely in their characteristics. For example, Houston clay, shallow phase; Norfolk sand; Susquehanna clay, slope phase; and Ochlockonee silt loam have marked differences from one another both in external and internal characteristics and in the agriculture and methods of management to which they are suited. Because of the great variance in the agricultural practices in Macon County on the various soils, and the lack of specific information as to relative significance of the various crops, a satisfactory listing of the soils in the descending order of their general productivity would be difficult; therefore no table of productivity indexes and general productivity grade numbers reflecting such an arrangement is included in this report.

LAND USES AND AGRICULTURAL METHODS

It is the object of this section to relate crop and fertilizer recommendations to the soils of the 10 groups described in the section on Soils and Crops and to discuss varieties of the various crops. The different soils comprising each group have individual characteristics that may restrict or make them highly desirable for certain specialized crops, even though the other members of the group are not adapted to those crops. For instance, in the first group—soils with sandy surface soils and yellow or red friable sandy clay subsoils—the Red Bay and Amite soils are not equal to the other soils of the same group in the production of tobacco or potatoes. On the other hand, the Red Bay and Amite soils are better suited than the other members of the group to the production of cotton and possibly oats. For general farm crops, however, all the soils in each group are expected to produce comparable yields under similar management and fertilization. In contrast, the soils placed in different groups possess widely different characteristics and, in many instances, entirely different land uses.

SOILS WITH SANDY SURFACE SOILS AND YELLOW OR RED FRIABLE SANDY CLAY SUBSOILS

Soils with sandy surface soils and yellow or red friable sandy clay subsoils, comprising the sandy loams and fine sandy loams of the Norfolk, Ruston, Sawyer, Faceville, Orangeburg, Red Bay, Kalmia, Cahaba, Izagora, and Amite series, as well as the slope phase of Ruston fine sandy loam, are used mainly for general farm crops. They are the most friable, best developed, most easily tilled, most suitable for diversified farming, most responsive to management, least erodible, and most desirable for general farm crops in the county. They have excellent moisture conditions for crops, and the yields correspond to the fertilization and management practiced. In other words, moisture is not normally such a limiting factor as in

TABLE 6.—*Estimated range and average acre yields of*

Soil	Cotton (lint)			Corn			Winter oats			Soybeans and cowpea hay [3]		
	A		B	A		B	A		B	A		B
	Lb.	*Lb.*	*Lb.*	*Bu.*	*Bu*	*Bu.*	*Bu.*	*Bu.*	*Bu*	*Tons*	*Tons*	*Tons*
Alluvial soils, undifferentiated [4]					20	35					1	2
Altavista fine sandy loam	100–250	125	200		5	15	15–35	18	35		.25	.5
Amite fine sandy loam	300–500	440	550	20–30	25	40	30–45	35	50	1–2	1	2
Augusta silt loam		150	300	10–25	15	25	15–30	20	35	.5–1 5	.75	1 5
Bell clay				25–50	35	50				.75–2 5	1	2
Bibb fine sandy loam [4]		15	25	10–25							1	2
Bibb silt loam [4]		15	25								1	2
Cahaba loamy sand	150–250	200	350	8–20	13	25		18	35	.5–1	.5	1
Cahaba fine sandy loam	250–500	400	500	20–35	25	40	25–45	30	45	1–2	.75	1. 5
Cecil sandy loam, eroded hilly phase.		100	225		5	10		5	20			
Chesterfield sandy loam	100–250	140	225		7	20	5–25	10	25		.25	.75
Chesterfield sandy loam, eroded slope phase.	75–200	100	225		5	10		5	20			
Congaree loamy fine sand	200–400	275	400	15–30	25	35	20–35	25	40	.75–2	1	2
Congaree silt loam				25–45	35	60				1–2. 5	1. 5	2. 5
Cuthbert sandy loam, eroded phase.	100–250	140	225		7	20	5–25	10	25		.25	.75
Cuthbert sandy loam, eroded slope phase.		100	225		5	10		5	20			
Eutaw clay	75–250	100	300		8	30					.75	2
Faceville fine sandy loam	250–500	400	500	20–35	25	35	30–40	35	50	1–2	.75	1. 5
Flint sandy loam	150–300	200	350	7–15	10	20	15–30	18	35		.5	1
Flint sandy loam, deep phase	150–300	200	350	8–20	10	25	15–30	18	35		.5	1
Flint fine sandy loam	150–300	200	350	7–15	10	20	15–30	18	35		.5	1
Flint fine sandy loam, eroded phase.	50–200	75	150				2–25	5	20			
Gilead sandy loam	200–400	300	450	10–30	15	32	20–35	25	40			
Gilead sandy loam, eroded phase	100–250	140	225		7	20	8–25	10	25		.25	.75
Gilead sandy loam, slope phase	150–300	250	350		12	25		20	35	.25–1. 5	.5	1
Gilead sandy loam, eroded slope phase.		100	225		5	10		5	20			
Gilead-Cuthbert sandy loams, eroded slope phases.		100	225		5	10		5	20			
Houston clay, shallow phase				10–30	15	25	25–40	30	50		75	1. 5
Iuka silt loam [4]				15–30	20	35					1	2
Izagora fine sandy loam	200–400	300	400	15–28	18	32	20–35	25	35	.25–1 5	.5	1 5
Jamison fine sandy loam				15–45	35	50				.75–2	1	2
Kalmia sand		100	250		5	15		10	25		.25	.75
Kalmia loamy fine sand	150–250	200	350	8–20	13	25		18	35	.25–1	.5	1
Kalmia sandy loam	200–450	300	450	12–40	18	32	25–40	30	40	.5–2	.75	1. 5
Kalmia fine sandy loam	200–400	300	450	15–30	18	32	20–35	30	40	.5–2	.75	1 5
Kaufman clay [4]					15	25					1	2
Leaf sandy loam	100–200	150	250	5–20	12	25				.25–1	.5	1
Leaf fine sandy loam	100–200	175	350	5–20	12	25				.25–1	.5	1
Luverne fine sandy loam	200–400	300	450	10–30	15	32	20–30	25	40	.25–1 5	.5	1
Macon very fine sandy loam	150–500	400	500	10–35	20	32	20–45	35	50	.5–1. 5	.75	1. 5
Myatt fine sandy loam [4]	150–350			15–30								
Norfolk sand	75–200	100	250	3–10	5	15	10–20	10	25		.25	.75
Norfolk sand, slope phase		100	250		5	15		10	25		.25	.75
Norfolk fine sand	150–300	200	350	12–25	13	25	15–30	18	35		.5	1
Norfolk loamy sand	130–275	200	350	10–20	13	25		18	35	.5–1	.5	1
Norfolk loamy sand, slope phase		100	250		5	15		10	25		.25	.75
Norfolk sandy loam	250–500	400	500	20–40	25	40	25–40	30	40	.5–1. 5	.75	1. 5
Norfolk fine sandy loam	250–500	400	500	20–40	25	40	25–40	30	40	.5–1 5	75	1. 5
Ochlockonee silt loam				25–45	35	60				1–2 5	1 5	2. 5
Oktibbeha fine sandy loam	125–250	175	300	8–25	10	20	15–35	18	40	5–1 5	.5	1
Oktibbeha clay	75–225	100	275		6	18	10–30	15	35		.5	1
Oktibbeha clay, slope phase		100	225					5	20			
Orangeburg fine sandy loam	200–500	400	500	20–35	25	35	30–40	35	50	1–2	.75	1. 5
Roanoke silt loam [4]												

See footnotes at end of table.

the important crops on each soil in Macon County, Ala.[1]

Peanuts		Sugar-cane sirup		Sorghums (silage)		Sweet-potatoes		Potatoes		Bright leaf tobacco [2]	Winter legumes (vetches, Austrian winter peas) [3]	Fruits [3]	Pasture [4]	Principal crops or prevailing use
A	B	A	B	A	B	A	B	A	B	A	A	A	A	
Bu.	*Bu.*	*Gal.*	*Gal.*	*Tons*	*Tons*	*Bu.*	*Bu*	*Bu.*	*Bu.*					
---	---	100	200	8	18	---	---	---	---	---	---	---	c	Timber, pasture.
15	25	---	---	---	---	---	---	---	---	---	b	---	c	Cotton, oats.
40	50	---	---	---	---	---	---	---	---	---	a	a	---	Cotton, corn, hay.
---	---	100	200	8	16	---	---	---	---	---	---	---	b	Corn, oats, sorghum, hay, pasture.
---	---	---	---	15	25	---	---	---	---	---	---	---	a	Pasture, corn, hay.
---	---	100	200	8	18	---	---	---	---	---	---	---	c	Timber, pasture, corn, sorghum.
---	---	100	200	8	18	---	---	---	---	---	---	---	c	Timber, pasture.
30	40	---	---	---	---	60	110	70	120	b	b	b	---	Cotton, corn, hay.
40	50	---	---	---	---	90	150	100	200	a	a	a	---	Do.
---	---	---	---	---	---	---	---	---	---	---	---	---	---	Timber.
15	30	---	---	---	---	---	---	---	---	---	c	c	c	Cotton, oats.
---	---	---	---	---	---	---	---	---	---	---	---	---	---	Timber.
---	---	100	200	8	20	---	---	---	---	---	b	---	c	Cotton, corn, hay, oats.
---	---	200	300	15	30	---	---	---	---	---	---	---	b	Corn, hay, oats.
15	30	---	---	---	---	---	---	---	---	---	c	c	c	Cotton, oats.
---	---	---	---	---	---	---	---	---	---	---	---	---	---	Timber.
30	50	---	---	8	15	---	---	---	---	---	---	---	c	Pasture, timber, cotton, oats.
40	50	---	---	---	---	90	150	100	200	---	a	a	---	Cotton, corn, hay.
30	40	---	---	---	---	60	110	60	110	---	b	---	---	Cotton, oats.
30	40	---	---	---	---	60	110	60	110	---	b	---	---	Do.
30	40	---	---	---	---	60	110	60	110	---	b	---	---	Do.
10	20	---	---	---	---	---	---	---	---	---	c	---	---	Do.
40	50	---	---	---	---	75	125	75	125	---	a	a	---	Cotton, corn, hay.
15	30	---	---	---	---	---	---	---	---	---	c	c	c	Cotton, oats.
30	40	---	---	---	---	60	100	60	100	---	a	---	---	Cotton, hay.
---	---	---	---	---	---	---	---	---	---	---	---	---	---	Timber.
---	---	---	---	---	---	---	---	---	---	---	---	---	---	Do.
30	50	---	---	8	15	---	---	---	---	---	---	---	b	Pasture, oats, corn.
---	---	100	200	10	20	---	---	---	---	---	c	---	---	Timber, pasture, corn, sorghum.
40	50	---	---	---	---	90	150	100	200	b	a	a	---	Cotton, corn, hay.
---	---	150	250	12	25	---	---	---	---	---	---	---	b	Corn, hay, sorghum.
20	35	---	---	---	---	40	75	40	75	c	c	b	---	Building sites, truck garden patches.
30	40	---	---	---	---	60	110	70	120	---	b	b	---	Cotton, corn, hay.
40	50	---	---	---	---	90	150	100	200	a	a	a	---	Do.
40	50	---	---	---	---	90	150	100	200	a	a	a	---	Do.
---	---	100	200	8	18	---	---	---	---	---	---	---	c	Timber, pasture.
---	---	75	150	5	10	---	---	---	---	---	---	---	c	Cotton, hay, sorghum, pasture.
---	---	75	150	5	10	---	---	---	---	---	---	---	c	Do.
40	50	---	---	---	---	75	125	75	125	---	---	a	---	Cotton, some subsistence crops.
40	50	---	---	---	---	90	150	100	200	---	a	a	---	Cotton, oats, hay.
---	---	75	150	4	10	---	---	---	---	---	---	---	c	Timber, pasture.
20	35	---	---	---	---	40	75	40	75	c	c	b	---	Cotton, corn, hay, timber.
20	35	---	---	---	---	40	75	40	75	c	c	b	---	Timber.
30	40	---	---	---	---	60	110	70	120	b	b	b	---	Cotton, corn, hay.
30	40	---	---	---	---	60	110	70	120	b	b	b	---	Do.
20	35	---	---	---	---	40	75	40	75	c	c	b	---	Timber, range land.
40	50	---	---	---	---	90	150	100	200	a	a	a	---	Cotton, corn, hay.
40	50	---	---	---	---	90	150	100	200	a	a	a	---	Do.
---	---	200	300	15	30	---	---	---	---	---	---	---	b	Corn, hay, sorghum, pasture.
20	30	---	---	---	---	---	---	---	---	---	b	---	c	Cotton, pasture, oats, hay.
25	40	---	---	3	6	---	---	---	---	---	c	---	c	Pasture, cotton, oats.
---	---	---	---	---	---	---	---	---	---	---	---	---	c	Timber, pasture.
40	50	---	---	---	---	90	150	100	200	---	a	a	---	Cotton, corn, hay.
---	---	75	150	4	10	---	---	---	---	---	---	---	c	Pasture.

See footnotes at end of table.

TABLE 6.—*Estimated range and average acre yields of the im*

Soil	Cotton (lint)			Corn			Winter oats			Soybeans and cowpea hay [1]		
	A		B	A		B	A		B	A		B
	Lb.	*Lb*	*Lb*	*Bu.*	*Bu.*	*Bu*	*Bu*	*Bu*	*Bu*	*Tons*	*Tons*	*Tons*
Red Bay fine sandy loam	300–300	400	500	15–30	20	40	32–35	35	50	1–2	.75	1 5
Riverwash												
Ruston fine sandy loam	250–500	400	500	20–40	25	40	25–40	30	45	1–1 5	.75	1.5
Ruston fine sandy loam, slope phase	150–350	225	400	8–30	14	28	25–40			.25–1 5	.5	1
Sawyer fine sandy loam	175–350	250	400	8–25	12	25	12–40	20	32	25–1. 5	.5	1 5
Shubuta sandy loam	200–400	300	450	10–30	15	32	20–30	25	40	25–1. 5	.5	1.0
Steep hilly land (Gilead and Cuthbert soil materials).												
Sumter clay				5–25	10	30	10–35	15	30	25–1 5	.5	1 5
Susquehanna very fine sandy loam	125–250	150	250	5–15	8	20	10–30	15	35	25–1 5	.5	1
Susquehanna clay	75–200	100	275		6	18	10–30	15	35		.5	1
Susquehanna clay, slope phase												
Swamp												
Vaiden very fine sandy loam	150–300	200	400		12	28	12–35	18	36		5	1 5
Vaiden clay	75–250	100	300		8	28	5–30	8	30		5	1 5
Vaiden-Susquehanna clays												
Vaiden-Susquehanna clays, steep phases												
Wickham fine sandy loam	200–350	250	400	12–25	13	28	20–40	35	50		.5	1
Wickham fine sandy loam, thin surface soil phase	100–250	125	200	2–20	5	15		18	35		.25	5
Wickham silt loam	250–400	300	500	15–40	30	45	20–40	35	50	1–2 5	1 5	2 5

[1] The estimates are based on observations in the field together with estimates furnished by local farmers, members of the staff of the Alabama Agricultural Experiment Station, members of the staff of the Extension Service of the Alabama Polytechnic Institute, and others who have had experience in the agriculture of the county. The figures in column A refer to yields obtained under the more common practices of management that include the use of commercial fertilizers for the cash crops, but systematic rotations, including grasses and legumes are not followed and little special effort is given to measures of erosion control A range of expected yields for cotton, corn, oats, and hay is shown, in addition to the average yields. The figures in column B refer to yields obtained under the better practices of management that include more careful and liberal fertilization, the use of legumes and cover crops in the rotation, and more intensified measures of erosion control. Absence of an estimate indicates that the crop is not commonly grown.

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

other soils. They warm early in the spring and are among the first in the county on which agricultural operations begin. The subsoils are sufficiently heavy in texture to retain moisture and fertilizer, yet they are sufficiently permeable to allow good movement of water, both gravitational and capillary, in the surface soil and subsoil.

Most of the experimental work done in the State has been done on soils having these characteristics. Practically all of the experimental data obtained refer to these soils. Because much information has been obtained on these soils by the Alabama Agricultural Experiment Station, the recommendations and suggested land uses for the soils of this group are taken from the data of that station.

The Alabama station has found that the best cotton varieties for Macon County soils are Cook 144, Clevewilt, and Dixie Triumph. The cotton should be fertilized with an acre application of 36 pounds of nitrogen, 48 pounds of phosphoric acid, and 24 pounds of potash. This may be obtained either as 600 pounds of a 6–8–4 mixture at planting time, or as 225 pounds of nitrate of soda or the equivalent and 300 pounds of superphosphate and 48 pounds muriate of potash (one-fourth of the nitrate of soda applied at planting time with the potash and phosphate and the rest as a side dressing after first chop-

portant crops on each soil in Macon County, Ala.[1]—Continued

Peanuts		Sugar-cane sirup		Sorghums (silage)		Sweet-potatoes		Potatoes		Bright leaf tobacco [2]	Winter legumes (vetches, Austrian winter peas) [3]	Fruits [3]	Pasture [3]	Principal crops or prevailing use
A	B	A	B	A	B	A	B	A	B	A	A	A	A	
Bu.	*Bu.*	*Gal.*	*Gal.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Bu.*	*Bu.*					
35	45	----	----	-----	-----	----	----	----	----	-------	a	a	------	Cotton, corn, hay.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	------	Road material.
40	50	----	----	-----	-----	90	150	100	200	a	a	a	------	Cotton, corn, hay.
35	50	----	----	-----	-----	75	125	100	150	a	a	a	------	Do.
30	45	----	----	-----	-----	75	125	100	150	-------	a	a	------	Do.
40	50	----	----	-----	-----	75	125	75	125	-------	a	a	------	Cotton, subsistence crops.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	------	Timber.
----	----	----	----	5	15	----	----	----	----	-------	-------	-------	c	Pasture, oats, corn, hay.
20	30	----	----	-----	-----	----	----	----	----	-------	c	-------	c	Cotton, pasture, oats, hay crops, corn.
25	40	----	----	3	6	----	----	----	----	-------	c	-------	c	Pasture, cotton, oats, hay.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	c	Timber, pasture.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	------	Timber.
25	40	----	----	-----	-----	75	125	75	125	-------	c	-------	c	Cotton, pasture, oats.
30	50	----	----	5	12	----	----	----	----	-------	-------	-------	b	Pasture, cotton, oats.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	c	Timber, pasture.
----	----	----	----	-----	-----	----	----	----	----	-------	-------	-------	c	Do.
35	45	----	----	-----	-----	75	125	75	125	-------	a	c	------	Cotton, some subsistence crops
15	25	----	----	-----	-----	----	----	----	----	-------	b	-------	c	Cotton, oats, pasture.
----	----	150	250	12	25	----	----	----	----	-------	-------	-------	b	Corn, oats, hay, cotton.

[2] No yield estimates are given for bright leaf tobacco, winter legumes (vetches, and Austrian winter peas), fruits, or pasture, because of a lack of specific information The letters a, b, and c indicate respectively the comparative general suitability and productivity of the soils for the particular crop or group of crops. Fruits, as used here, include peaches, figs, grapes, pears, and pecans. In general, a means well suited or relatively high productivity, b, fair, and c, poor or low.

[1] The yield estimates apply only to the artificially drained or higher lying areas of these soils that are above hazardous overflows.

ping); or as 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 row. One of the best methods of doing this is to place fertilizer down and list or bed on it. The listing or bedding may be done and the seed and fertilizer put out at the same time with the drill, by placing the fertilizer 2½ or 3 inches below the seed.

Corn varieties recommended for the county are Whatley Prolific and Hastings Prolific (white varieties) and Jarvis Golden Prolific and Indian Chief (yellow varieties). The corn should be grown in rotation with cotton and side-dressed with 225 pounds to the acre of nitrate of soda or the equivalent when the corn is about knee high, or it should follow a winter cover crop on land that has received a liberal application of phosphate or basic slag.

As a winter cover crop, either vetch or winter peas should be very satisfactory for soil improvement. They should be planted as early in the fall as weather conditions will allow, preferably September or October. Inoculation of seed is necessary unless the crops have been grown on the field within the preceding 5 years. Seed may be broadcast or drilled, depending on the equipment owned by the farmer. Superphosphate should be applied at the rate of 300 to 400 pounds to the acre, or the equivalent of basic slag, at the time of planting,

unless the land has received annually the equivalent of this quantity of phosphate for several years. Basic slag may be mixed with the inoculated seed at the time of planting without detriment to the inoculant. Superphosphate, however, may injure the inoculant if it is mixed with the inoculated seed.

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

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

When peanuts are grown on poor soil where no fertilizer was used for the previous crop, an application of 400 pounds of basic slag to the acre should be used. When fertilizer is used, it should be applied at or before the time of planting. Where peanuts follow a cotton crop on land that has been heavily fertilized, it is doubtful whether fertilization is necessary.

SOILS WITH BROWN SURFACE SOILS AND FRIABLE SUBSOILS ON FIRST OR SECOND BOTTOMS

Soils with brown surface soils and friable subsoils on first or second bottoms—the Congaree, Ochlockonee, Augusta, and Jamison soils and Wickham silt loam—are used almost entirely for corn and hay crops, as they are naturally adapted to these crops. They are well suited to the growing of pasture plants, particularly lespedeza, Dallis grass, White Dutch clover, hop clover, and carpet grass. The greatest hazard to these soils is occasional overflow during the crop season. The corn billbug does considerable damage in some areas. Land devoted to corn and hay crops is seldom fertilized, although, according to some results that have been obtained by the Alabama Agricultural Experiment Station on similar soils, it is possible that the use of 100 to 150 pounds to the acre of nitrate of soda or its equivalent would be profitable for the production of corn. It is doubtful whether any fertilization would be economical for hay crops, except perhaps 100 to 200 pounds of superphosphate to the acre. It is believed that 200 to 400 pounds of superphosphate would be economical for the development of pasture, but this has not been substantiated by experimental data.

SOILS WITH SANDY SURFACE SOILS AND YELLOW OR REDDISH-BROWN COMPACT SUBSOILS

Soils with sandy surface soils and yellow or reddish-brown compact subsoils are Gilead sandy loam; Gilead sandy loam, slope phase; the Shubuta, Luverne, and Flint soils; and Wickham fine sandy loam. These are the second most important soils of the county as regards ease of tilling, suitability for diversified crops, and response to management. They do not have the loose friable lower subsoil layer that characterizes the soils of the first group, and they do not have such favorable moisture conditions for crops. Surface and internal drainage of these soils are good, and they warm early in the spring, which is an aid to their utilization for general farm crops, particularly cotton.

The crops, varieties, and fertilizations recommended for the soils of the first group should be applicable to the soils of this group, but yields, particularly of corn, will not be so large as those on soils of the foregoing group. The rotation of general farm crops is recommended for the soils of this group, but under normal conditions the production of cotton is considered more profitable than the production of corn. No experimental work has been done on any of these soils or on similar soils.

SOILS WITH SANDY SURFACE SOILS AND MOTTLED HEAVY PLASTIC CLAY SUBSOILS

Soils with sandy surface soils and mottled heavy plastic clay subsoils are Macon very fine sandy loam, Susquehanna very fine sandy loam, Vaiden very fine sandy loam, Oktibbeha fine sandy loam, Leaf sandy loam, and Leaf fine sandy loam. The heavy texture of the subsoil restricts crop adaptations and makes these soils susceptible to erosion. They are best suited to the production of cotton, oats, sorgo, peanuts, soybeans, and pasture grasses, according to observations and experimental data. The recommended varieties of these crops are the same as those discussed for soils of the first group.

Fertilization for cotton, oats, peanuts, soybeans, and winter cover crops should be the same as that suggested for soils of the first group, but yields are normally less. For sorgo, 150 to 225 pounds to the acre of nitrate of soda or its equivalent should be applied if the crop is grown in rotation with cotton on land that has been heavily fertilized. Otherwise, 250 to 400 pounds of superphosphate and 50 pounds of muriate of potash should be used in addition to the nitrate. This recommendation is based on results obtained on a similar soil of the Black Belt—Vaiden clay.

For pasture grasses the following fertilizations are recommended: For Dallis grass, 10 pounds to the acre; common lespedeza, 10 pounds; hop clover, 1 pound; and orchard grass, 10 pounds. The land should receive 375 pounds of superphosphate and 1,000 to 2,000 pounds of limestone or 600 to 800 pounds of basic slag to the acre.

According to results obtained on Sumter clay at the Black Belt Substation, this soil is best suited to the production of oats, Dallis grass, black medic, alfalfa, corn, sorgo, soybeans, sagrain, cowpeas, and possibly Kentucky bluegrass. These crops do not make satisfactory growth unless the land is liberally fertilized. For alfalfa, the land should be fertilized with 375 pounds to the acre of superphosphate and 50 pounds of muriate of potash or its equivalent, annually. The fertilizers should be applied at the time of planting, and each year thereafter they should be applied in the fall. For other crops, the results at the substation indicate that about 375 pounds of superphosphate and 50 pounds of muriate of potash to the acre should be applied for each crop except oats and Dallis grass, and for these, 375 pounds of superphosphate and 225 pounds of nitrate of soda should be used. No lime is needed on this soil. This soil is not considered suited to the production of cotton, but should cotton be grown, applications of 375 pounds of superphosphate and 350 pounds of muriate of potash are recommended. If vetch is grown, the land should receive 375 pounds of superphosphate and 50 pounds of muriate of potash to the acre.

CALCAREOUS HEAVY CLAY SOILS

The calcareous heavy clay soils—Houston clay, shallow phase; Sumter clay; and Bell clay—constitute the true Black Belt soils. They are all neutral to alkaline in reaction and have special crop adaptations.

Fertilizer and crop recommendations have been obtained on Houston clay at the Black Belt Substation at Marion Junction, and the recommendations made for this soil should also be applicable to Bell clay. According to the results, Houston clay is adapted to Dallis grass, white clover, sorgo, sagrain, soybeans, cowpeas, corn, and possibly peanuts. For best results with all these crops the land should be fertilized with 375 pounds of superphosphate to the acre. For Dallis grass it should be fertilized with 225 pounds of sodium nitrate, and for sorgo and sagrain 50 pounds of muriate of potash, in addition to the phosphate. Fertilizer for corn did not prove profitable. These results are based on a 5- to 6-year period. In addition to the crops mentioned, it has been observed that Johnson grass, partridge-peas and sensitiveplant do well on this soil. Lespedeza grows in a few places but tends to develop chlorosis. Oats produce large yields where not drowned out during the winter.

Under the management practiced, peanuts produced an average yield of 2,012 pounds an acre, sagrain 25.7 bushels, corn 26.1 bushels, sorgo 33,597 pounds (green weight), vetch 4,926 pounds (green weight), soybeans, 3,823 pounds, and cowpeas 1,335 pounds. The pasture grasses made excellent growth and supplied an exceptionally large amount of grazing.

At the substation under the above-mentioned fertilizations, acre yields were as follows: Oats 33 bushels, alfalfa 5,774 pounds, corn 24.7 bushels, sorgo 24,040 pounds (green weight), soybeans 3,057 pounds, and cowpeas 2,688 pounds. The earliest grazing in the spring comes from this soil. Black medic and hop clover supply the basic part of the grazing. Dallis grass supplies summer and fall grazing. As this soil is droughty, however, not so good growth is maintained during the summer as on the Houston and Bell soils. Kentucky bluegrass at present looks promising, although the results are not conclusive.

The above recommendations are subject to further elaboration and may be changed as more results are obtained. Information relative to crops and fertilizers may be obtained from the Black Belt Substation, Marion Junction, Alabama, and from the Alabama Agricultural Experiment Station, Auburn, Ala.

SOILS WITH HEAVY CLAY SURFACE SOILS AND MOTTLED HEAVY PLASTIC CLAY SUBSOILS

Soils with heavy clay surface soils and mottled heavy plastic clay subsoils include the clay members of the Susquehanna, Oktibbeha, Vaiden, and Eutaw series.

Even though these soils differ widely in many respects, they have many characteristics in common. They are all very heavy and sticky, are very acid in reaction, and are very erodible. They are therefore very difficult to till and need heavy applications of lime. Since ex-

perimental results have been obtained on Vaiden clay at the Black Belt Substation at Marion Junction, the results will be given as recommendations for all the soils of this group. Vaiden clay is best suited to the production of oats, peanuts, sorgo, sagrain, orchard grass, lespedeza, Dallis grass, cowpeas, soybeans, Austrian Winter peas, hairy vetch, cotton, velvetbeans, and possibly corn.

Cotton land should be fertilized with 400 to 600 pounds of a 6–10–4 fertilizer and 2 tons of lime to the acre. The lime is sufficient to last several years. For the other crops the land should receive 375 pounds of superphosphate. In addition to superphosphate, cowpeas, hairy vetch, soybeans, Austrian Winter peas, lespedeza, and peanuts need 2 tons of lime, which lasts many years. Land in sorgo should receive in addition to the superphosphate 50 pounds of muriate of potash, 225 pounds of nitrate of soda, and 2 tons of lime. The lime is sufficient for many years. The requirements for Dallis grass are apparently the same as those for sorgo except that potash is not required. If corn is grown on this soil, 375 pounds of superphosphate, 225 pounds of nitrate of soda, or its equivalent, and 2 tons of lime should be used. Velvetbeans and orchard grass make maximum profitable growth when superphosphate alone is used.

The acre yields of the various crops on this soil, according to these experiments, are approximately as follows: Oats 29 bushels,, peanuts 1,960 pounds, sorgo 23,000 pounds (green weight), sagrain 25.5 bushels, cowpeas 3,500 pounds, soybeans 4,000 pounds, cotton 733 pounds of seed cotton, and corn 28.5 bushels.

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

SANDS, FINE SANDS, AND LOAMY SANDS

Sands, fine sands, and loamy sands are members of the Norfolk, Cahaba, and Kalmia series. They are extremely sandy in character and very subject to leaching of the soluble plant nutrients. An insufficient supply of moisture is retained for the production of summer-growing crops. They are best suited to the production of spring-growing crops—peanuts, peaches, and velvetbeans—although cotton and corn produce satisfactory yields on the level areas where liberal applications of manure or commercial fertilizer have been made or where winter cover crops have been turned under.

Very little experimental work has been done on these soils, and recommendations are based on field observations and interviews with farmers.

The crop varieties recommended for the soils of this group are the same as those for soils of the first group. The same types of fertilization are recommended as for the soils of that group, although yields are much less. Moisture and plant nutrients are readily lost by leaching as a result of the sandy and porous character of the surface soils and subsoils. These soils, therefore, are rather droughty for summer and fall crops. The most profitable returns from fertilization are expected on the crops that grow during the spring, when moisture is most abundant.

414558—44——6

SOILS WITH SHALLOW SANDY SURFACE SOILS AND YELLOW OR REDDISH-BROWN COMPACT SUBSOILS

Gilead sandy loam, eroded phase; Chesterfield sandy loam; Cuthbert sandy loam, eroded phase; Altavista fine sandy loam; Wickham fine sandy loam, thin surface soil phase; and Flint fine sandy loam, eroded phase, all have shallow surface soils and yellow or reddish-brown compact subsoils.

These soils are droughty for summer-growing crops, owing to the fact that they have shallow surface soils, which directly overlie firm, compact clay subsoils. Droughty conditions limit the crop utilization of these soils. In other words, the soils of this group are best suited to crops growing during the winter and spring or to those that do not require a large quantity of moisture during the growing season. Therefore, they do not lend themselves to diversified farming, particularly a rotation built around the production of corn. They are best suited, according to observation, to the production of oats, winter cover crops, cotton, and velvetbeans. No experimental work has been done on the soils of this group.

The varieties of the various crops discussed under the first group are applicable to the soils of this group, although the yields and crop adaptations are different. Under current economic conditions and present cultural management it is doubtful whether these soils can be profitably utilized for the production of corn. Cowpeas following oats produce rather low yields, although profitable yields may be obtained by using 300 to 600 pounds of basic slag to the acre provided the crop is planted early in the season. The production of oats and winter cover crops is the best utilization of the soils of this group, as these crops grow during the moist season. Oats should be fertilized with 150 to 225 pounds of nitrate of soda or its equivalent to the acre; and for winter cover crops, either hairy vetch or Austrian Winter peas, the land should be fertilized with 300 to 400 pounds of superphosphate or the equivalent of basic slag at the time of planting. Probably no more than one-half of the base application for the production of cotton discussed for the first group is profitable on these soils, because of the very limited moisture contained in the soils of this group.

POORLY DRAINED SOILS OF THE FIRST AND SECOND BOTTOMS

Poorly drained soils of the first and second bottoms are the Roanoke, Myatt, Iuka, Kaufman, and Bibb soils; alluvial soils, undifferentiated; and the swamp and riverwash land types.

In their native conditions the soils of this group are either insufficiently drained or are subject to frequent overflow, thus handicapping their utilization for farm purposes. They are used principally for forestry and pasture, although some areas have been cleared, drained, and utilized for corn, sorgo, soybeans, and, in a few places, cotton.

With the exception of swamp and riverwash, the soils of this group have good possibilities for pasture, provided the areas are drained, the timber removed, and undergrowth, such as blackberry briers and sweetgum bushes, kept down. Carpet grass is naturally adapted to these soils, and Dallis grass and lespedeza may be grown

satisfactorily provided 200 to 400 pounds of superphosphate to the acre is applied annually to the soil. 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 sorgo and 200 to 300 pounds of superphosphate for soybeans would probably be profitable. The use of 200 to 400 pounds of a 6–8–4 fertilizer for cotton is recommended. These recommendations are based on observations and experiences of the farmers, as no experimental work has been done on these or related soils.

SOILS OF ERODED AND SLOPING AREAS AND STEEP HILLY LAND

Soils of the eroded and sloping areas are little used for agricultural purposes. The relief and character of the soils preclude almost entirely their use for cultivated crops. They are used for forestry and range-land pasture. The soils are Gilead sandy loam, eroded slope phase; Chesterfield sandy loam, eroded slope phase; Cuthbert sandy loam, eroded slope phase; Gilead-Cuthbert sandy loams, eroded slope phases; Susquehanna clay, slope phase; Oktibbeha clay, slope phase; Cecil sandy loam, eroded hilly phase; Vaiden-Susquehanna clays; Vaiden-Susquehanna clays, steep phases; and steep hilly land (Gilead and Cuthbert soil materials).

According to the State Extension Forester, forest fires should be eliminated for best returns; the more merchantable timber, such as old-field pine, longleaf pine, slash pine, white oak, red oak, hickory, tuliptree, and ash should be protected in their respective habitats; and a large part of the timber should be allowed to reach maturity. In addition, these soils make fair to good game preserves, supporting enough underbrush cover and cane along the streams for some deer in the larger areas and enough nuts, beggarticks, mast, native vetch, native lespedeza, French mulberry and dogwood seeds, and other feed for the raising of quail and wild turkeys.

MORPHOLOGY AND GENESIS OF SOILS

Soil is the product of forces of weathering and development acting on the materials deposited or accumulated by geologic agencies. The characteristics of the soil at any given point depend on (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil material has accumulated and existed since accumulation, (3) the plant and animal life in and on the soil, (4) the relief, or lay of the land, and (5) the length of time the forces of development have acted on the material. External climate, although important in its effect on soil development, is less so than internal soil climate, which depends not only on temperature, rainfall, and humidity, but on the physical characteristics of the soil or soil material and the relief, which, in turn, strongly influences drainage, aeration, runoff, erosion, and exposure to sun and wind.

Macon County is entirely in the Gulf Coastal Plain, with the exception of the extreme northern part, which barely touches the Piedmont Plateau. It lies in the region of Red Podzolic and Yellow Podzolic soils, where light-colored surface soils and red or yellow subsoils prevail. All the soils of the uplands have good surface

drainage, and all except the heavy clays have good internal drainage. The soils have developed under forest cover, dominantly of longleaf pine, some slash pine, and deciduous trees, mainly oaks on the uplands and gum and cypress in the swamps. The soils of the prairie part of the county have developed under grass vegetation, and this cover has given a dark color to the surface soils.

In Macon County there are several important geologic formations, the weathered products of which have given rise to a large number of different soils. In the extreme northern end of the county near Notasulga, igneous rocks of the Piedmont Plateau are near the surface, and outcrops of them occur on the breaks near the streams. Very small areas of soil have developed from residuum over these rocks, whereas larger areas consist of a shallow covering of sandy Coastal Plain material over clays derived in place from the igneous rocks.

The northern part of the county and probably one-third of the total area is classed in the Tuscaloosa formation.[6] It is characterized by light-colored irregularly bedded sand, clay, gravel, and some lignite. The sand and clay range from light drab and gray to dark green or gray and in many places are blotched or banded with purple, red, pink, yellow, and brown. Mica is a common constituent. The coarse soil textures prevailing in this part of the country are approximately coextensive with the Tuscaloosa formation, although it is possible that coarser textured materials may be a contribution from the Piedmont province to the north.

South of the Tuscaloosa formation, beginning approximately in the latitude of Tuskegee and extending southward, is the Eutaw formation. This consists of gray or greenish-gray fine- or medium-grained glauconitic sand, cross-bedded or massive, with subordinate laminae and laminated layers of dark clay in the lower part. In this belt have developed soils generally with fine sandy surface soils and somewhat red heavy more or less plastic subsoils.

South of the Eutaw formation is a Selma chalk formation, the greater part of which extends south some distance into Bullock County and westerly across the State. In Macon County this formation is confined to a narrow belt along the southern border ranging in width from about 3 to 6 or more miles. The formation is characterized by a chalky limestone with variable quantities of clay and sand impurities. It is believed to have originated as chalky more or less muddy oozes that gradually accumulated on the bottom of a clear and only moderately deep sea. Here, as elsewhere, this formation has been reduced more readily and uniformly than the sandy Eutaw and Tuscaloosa formation, and as a result it lies lower than those formations.

The soils of the county have developed through the soil-forming processes from these several formations as parent materials. These materials have been acted on by rainfall, temperature, biological agencies, and native vegetation; consequently they have taken on a variety of characteristics, which are reflected in the several soils.

Throughout the county the environmental conditions of climate and vegetation in general are much the same. An abundant annual

---

[6] STEPHENSON, L. W. THE MESOZOIC ROCKS. *In* Geology of Alabama. Ala. Geol. Survey Spec. Rpt. 14, pp. 231–250, illus. 1926.

rainfall of about 46 inches with moderately warm temperatures prevails. Leaching continues in part of the soil throughout most of the year, carrying downward soluble mineral elements. This is apparent in most of the soil where the surface soil consists of rather loose incoherent sands and the upper part of the subsoil or B horizon is sand or fine sand. Except for the calcareous soils of the prairie belt, the reaction is strongly acid.

Erosion and gullying have become serious problems on most of the soils of the sloping uplands, especially on the sloping areas of the Susquehanna, Cuthbert, Gilead, Oktibbeha, and Sumter soils and on steep hilly land. Much sheet erosion also is going on in areas of gentle relief, as on the Houston and other more level calcareous soils. The effect of erosion is apparent in galled areas and gullies across fields, by the translocation of finer soil particles from higher lying areas and deposition at the base of the slopes and along many of the small streams.

According to soil development, the soils of the county may be placed in two groups—those that have normal or well-developed profiles, and those that have poorly developed profiles owing to various degrees of erosion, deficient drainage, aeration, and oxidation. Soils of the first group include members of the Norfolk, Orangeburg, Faceville, Ruston, Luverne, Red Bay, Amite, Cahaba, and Kalmia series. The apparent common features of these soils consist of a comparatively light textured and well leached A horizon, a heavier textured B horizon, and a C horizon that is generally heavier than the A but lighter than the B. The B horizon shows the most intense coloration and the most complete oxidation in the profile. These soils well illustrate the influence of eluviation in the A horizon and illuviation in the B horizon. The iron salts are more or less completely oxidized, and this fact is responsible for the decidedly red color of the B horizons of most of these soils.

These soils are generally deficient in organic matter for the best growth of grasses and crops. In some of the alluvial soils, such as the Myatt, Bibb, and Ochlockonee, where leaching has been less pronounced, the content of organic matter is much greater.

All the soils range from acid to very strongly acid except the Black Belt or Prairie soils.

Table 7 gives the pH determinations of profiles of several soils in this county.

As a representative of the normally developed Red Podzolic soils of the county, the following is a description of a profile of Orangeburg fine sandy loam observed near Tuskegee:

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

6 to 16 inches, yellowish-brown or brown friable fine sandy loam becoming more loamy and redder in the lower part.

16 to 50 inches, bright brownish-red heavy fairly friable fine sandy clay that breaks readily and crumbles to a fine-granular mass. The lower part is not so highly colored or so friable as the upper part.

50 to 70 inches, light-red slightly compact and brittle fine sandy clay, which, when crushed, appears moderately friable. The color is varied with streaks of yellow and gray, and the material becomes less red with depth.

The chemical analyses of Orangeburg fine sandy loam from Lauderdale County, Miss., (table 8) will apply fairly well to Orangeburg

fine sandy loam from Macon County, Ala., as will also the mechanical analyses of Orangeburg fine sandy loam from Dallas County, Ala. (table 9).

TABLE 7.—*pH determinations of several soil profiles from Macon County, Ala.*[1]

Soil type and sample No.	Depth	pH	Soil type and sample No.	Depth	pH
Macon fine sandy loam	*Inches*		Vaiden very fine sandy loam:	*Inches*	
417384	0–5	4.4	417359	0–4	5.7
417385	5–14	4.1	417360	4–14	4.4
417386	14–21	4.1	417361	14–30	4.6
417387	21–36+	3.8	417362	30–40+	8.2
Oktibbeha clay			Izagora fine sandy loam:		
417301	0–2	6.5	417368	0–8	5.4
417302	2–5	5.9	417369	8–15	5.3
417303	5–20	5.1	417370	15–27	4.4
417304	20–28	4.5	417371	27–40+	4.5
417305	28–50	8.0	Susquehanna very fine sandy loam:		
Houston clay, shallow phase:			417372	0–4	5.1
417310	0–8	7.7	417373	4–7	4.6
417311	8–14	7.7	417374	7–14	4.2
417312	14–30	7.8	417375	14–24	4.4
417313	30–48+	7.5	417376	24–40+	4.1
Norfolk sandy loam:			Luverne fine sandy loam:		
417318	0–7	5.2	4173100	0–6	5.3
417319	7–18	5.4	4173101	6–9	5.4
417320	18–32	4.5	4173102	9–22	4.8
417321	32–48+	4.7	4173103	22–34	4.5
Amite fine sandy loam:			4173104	34–48	4.6
417326	0–5	5.8	Wickham fine sandy loam, thin surface soil phase.		
417327	5–9	5.4	4173124	0–5	4.8
417328	9–24	5.2	4173125	5–18	4.6
417329	24–40	4.9	4173126	18–24	4.9
417330	40–58	4.5	1473127	24–36	4.9

[1] Determinations made by hydrogen-electrode method by E. H. Bailey, assistant soil technologist, Division of Soil Survey.

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]93.66	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 and analyzed by W. O. Robinson and R. S. Holmes. 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.

TABLE 9.—*Mechanical analyses of Orangeburg fine sandy loam, 4⅓ miles north of Selma, Dallas County, Ala.*

Sample No.	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
	Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
30289	0–4	2.1	2.4	6.7	56.9	7.2	17.6	7.1
30290–30291	5–12	.1	1.9	6.4	54.1	8.0	16.3	13.0
30292	19–40	2	1.6	5.1	54.0	4.6	12.4	32.0
30293–30294	41–132	.1	1.5	7.4	61.4	3.1	24.9	1.7

The Luverne soils resemble the Orangeburg but differ in having a B horizon of heavy, tough, compact clay, which is often plastic when wet. The C horizon is in places lighter textured locally, approximating fine sand.

The Faceville also resembles the Orangeburg but contains more fine material and is less friable in the lower part of the subsoil and contains more mottlings.

The Red Bay soil covers a small total area. It has the friability and red coloration of the Orangeburg in the B horizon, but it is also red in the A horizon. The Amite soil of the second bottoms or terraces is the approximate equivalent of the Red Bay. The Ruston has less red coloration in the B horizon, whereas the Norfolk, a Yellow Podzolic soil, is yellow in the B horizon. The Izagora soils, first recognized in Macon County, resemble the Norfolk through the upper part of the B horizon, and the lower part consists of heavy, plastic fine sandy clay, more or less mottled with yellow, red, and brown. The Izagora soils also resemble the Kalmia soils, except that they are mottled in the lower part of the subsoil. The subsoils are not so heavy in texture as the Flint subsoils.

On the second bottoms or terraces, the Cahaba soils have the approximate development of color and structure of the Ruston soils and the structure characteristics of the Norfolk and Kalmia soils.

A description of a profile of Norfolk sandy loam, taken in a cultivated field near Salem Church near the northern boundary of the county, follows:

0 to 7 inches, yellowish-gray loamy sand.
7 to 18 inches, pale-yellow light-textured mellow and friable sandy loam.
18 to 32 inches, yellow friable sandy clay that breaks down readily to a structureless mass.
32 to 48 inches, yellow friable sandy clay, which in the lower part is slightly compact but brittle and contains faint mottlings of gray and brown.
48 inches+, mottled light-gray, yellow, brown, or light-red sandy clay material, which is variable in color and texture from place to place.

In wooded areas, the first 2 or 3 inches is grayish-brown loamy sand, owing to the presence of a small quantity of organic matter.

Associated with the Norfolk soils is the Gilead soil, which differs from the Norfolk in having a compact, tight B horizon, with mottled colors in the lower part, and a heavy C horizon. This soil is similar to the Cuthbert in its structure profile. The Gilead is yellow in the upper part of the B horizon and bears the same relation to the Norfolk soil that the Cuthbert does to the Ruston.

The Susquehanna soils occupy a belt in the south-central part of the county. They have light-colored sandy or red clay surface soils and plastic, tough, structureless, unweathered material in the subsoils. Here the B horizon is faintly developed in the sandy members but absent in the clay type.

A small area of Cecil soils lies at the northern border of the county. They are derived from crystalline materials, largely schists and gneiss.

Associated with the Cecil soils is the Chesterfield, which is composed largely of piedmont materials, although the surface soil consists of sandy Coastal Plain materials. The heavy and rather plastic subsoil is reddish yellow with mottled variations and contains considerable mica.

Many of the soils on the stream terraces in the northwestern part of the county have received materials derived from wash from the piedmont uplands to the north.

The Wickham soils, resembling the Cahaba soils, have somewhat shallower surface soils and much heavier textured subsoils. The Altavista is yellow in the subsoil but otherwise resembles the Wickham. The Altavista soils associated with the Wickham are less well drained, and their profiles are not so mature as elsewhere. The Roanoke resembles the Augusta but is still less well drained and developed.

The Flint soils resemble the Kalmia but are heavy and compact in the subsoil and not so plastic as the Leaf subsoils.

The Myatt soils, which are poorly drained, have dark-gray surface soils and yellowish-gray or gray compact subsoils mottled with rust brown.

On the first bottoms, the Ochlockonee soils, derived from Coastal Plain materials, are brown, friable, well-drained soils. Members of the Bibb series are light-colored or gray, poorly drained soils with mottled subsoils. The Iuka soils have brown well-drained surface soils like those of the Ochlockonee soils and light-colored mottled subsoils like those of the Bibb soils. The Congaree soils are brown and micaceous. They are developed largely from piedmont materials. Kaufman clay is dark and is composed of wash from the limy adjacent uplands and acid uplands.

All the soils of the Black Belt are immature for this climate. The Houston and Sumter clays are abnormal soils for this climate, because they contain large quantities of calcium carbonate. If erosion were not continually exposing fresh chalk and removing the residue from the weathering of the chalk, these soils probably would develop normal profiles, become acid in the course of a very long time, and finally, as maturity is attained, take on the characteristics typical of mature soils for this climate.

Representative of Houston clay, shallow phase, a Rendzina soil, a description of a profile observed 2½ miles southeast of Hardaway follows:

0 to 8 inches, dark grayish-brown firm moderately crumbly silty clay or silty clay loam.

8 to 14 inches, yellow or light brownish-yellow rather friable silty clay containing small concretions of lime, which break down readily.

14 to 30 inches, heavy plastic pale brownish-yellow silty clay, finely mottled with rust yellow, yellow, and some gray. There are a few nodules of lime in this horizon.

30 to 48 inches, heavy rather plastic silty clay, distinctly mottled with bluish gray, rust brown, or yellow, having a somewhat platy structure and containing moderate quantities of calcium carbonate in nodules and irregular streaks.

The Sumter soils generally occur in close association with the Houston soils. The underlying chalky deposits are generally uncovered in ditches and on exposed slopes. These soils have light-gray or brownish-gray surface soils grading downward through yellow silty clays into pale-yellow or creamy-white material containing streaks and scattered accumulations of calcium carbonate. This material, in turn, grades into the white, blocky, soft limestone, or Selma chalk, at a depth of 20 to 40 inches.

Bell clay is developed in areas of the Houston and Sumter soils around drainage heads and bases of slopes. It consists of accumulations of colluvial and some alluvial materials transported from adjacent higher elevations. The surface soils are noticeably darker than the adjacent soils, and the subsoils are brownish-yellow or dark heavy rather plastic clay. The reaction of the Houston, Sumter, and Bell soils is ordinarily alkaline.

Associated with these Rendzina soils are the Oktibbeha, Vaiden, and Eutaw soils. They are to some extent Rendzina soils but in places were forested with post oak and some pine. They are acid in the upper horizons but are underlain at a varying depth by Selma chalk. The overlying soil materials appear to be marine clays superimposed over the calcareous clays.

The Oktibbeha soils are the best developed of these soils and are often designated locally as "red prairie land," owing to the red developed B horizon. The following profile of Oktibbeha clay, representative of these soils, was observed near Downs:

0 to 2 inches, dark grayish-brown fine sandy clay containing enough organic matter to give it dark coloration in forested areas.
2 to 5 inches, yellowish-brown or slightly reddish brown silty clay.
5 to 20 inches, light-red or yellowish-red rather heavy sticky clay that is massive but breaks up and shows some flocculation.
20 to 28 inches, light-red heavy clay varied with irregular coloring of brown or rusty brown.
28 to 50 inches, almost white or light-yellow floury calcareous material, or Selma chalk.

The upper three horizons are distinctly acid.

The Vaiden soils, locally called "yellow sandy prairie," have grayish-brown surface soils and yellow or brownish-yellow heavy silty clay or sticky clay subsoils, which rest at a depth of 3 to 4 feet on limy or marly clay, the lime occurring in streaks or pockets in the upper part. The Vaiden soils occupy an intermediate position, as regards oxidation and aeration, between the reddish-brown well-drained Oktibbeha soils on the one hand and the heavy-textured imperfectly drained Eutaw soils on the other. The Eutaw soils have brownish-gray moderately heavy clay surface layers and are underlain by a layer, only a few inches thick, of brownish-yellow heavy plastic clay, which grades into light-gray heavy clay mottled with brown. No calcareous material is observed in the 3-foot section, but it is generally present from 4 to 6 feet below the surface.

The order of magnitude of the buffer and base-exchange capacity varies inversely with the degree of weathering, or these could be expressed as varying inversely in order of magnitude with the silica-sesquioxide ratio. Eutaw clay, with a ratio of 2.31, is highly mottled gray and yellow clay, and Oktibbeha clay, with a ratio of 1.90, is uniformly red.

Investigations by L. D. Baver [7] indicate that Eutaw clay is more plastic than Oktibbeha clay, and that the plasticity of these soils ranges in order of magnitude with the silica-sesquioxide ratio. Houston clay and Sumter clay are the least plastic, a result that would be expected because of their high calcium content.

[7] SCARSETH, G. D. MORPHOLOGICAL GREENHOUSE, AND CHEMICAL STUDIES OF THE BLACK BELT SOILS OF ALABAMA. Ala. Agr. Expt. Sta. Bul. 237, 48 pp., illus. 1943.

Table 10 gives the chemical composition of four soils from the Black Belt of Alabama, together with their silica-sesquioxide ratios.

TABLE 10.—*Chemical composition of the colloids from the soil profiles of typical Black Belt soil types and their silica-sesquioxide ratios* [1]

Soil type and No.	Depth	SiO_2	Al_2O_3	Fe_2O_3	P_2O_5	TiO	SiO_2 / R_2O_3	SiO_2 / Al_2O_3
	Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*		
Oktibbeha clay, 710	0- 2	37 639	28 662	9.550	0 1011	1.370	1 84	2 28
	2- 6	39 623	29 884	10 860	0775	1 326	1 83	2 25
	6-12	42 755	21 227	9 710	.0378	1 196	1 90	2 42
	12-18	44.012	33 138	9 070	0364	1 154	1 92	2 25
Eutaw clay, 772	0- 4	43 855	27 850	9 7704	.1116	.800	2 18	2 67
	4-14	45 055	27 848	8 9632	.0659	832	2 31	2 78
Sumter clay, 732	0- 4	44 440	26 062	8 9032	.6760	.0784	2. 38	2 89
Houston clay, 739	0- 6	37 010	27 274	8. 9831	.6500	.0928	1 90	2 30

[1] From Alabama Agricultural Experiment Station Bulletin 237.

SUMMARY

Macon County is located in east-central Alabama about midway between Montgomery, Ala., and Columbus, Ga. It is more or less rectangular in shape and includes an area of 614 square miles.

The climate is moderately mild, and the rainfall is abundant and fairly well distributed throughout the year except during the late spring and early fall. In many areas crops are occasionally damaged as the result of insufficient rainfall during this drier period.

The county includes level to gently rolling well-drained areas; low, flat, poorly drained areas; and extremely eroded badly broken to hilly areas. The gently rolling and well-drained areas comprise approximately 50 percent of the area of the county. A large proportion of the land—about 70 percent—is used for farm crops; the rest is used largely for pasture and range land. The low, poorly drained areas, which are used for range land and forestry and to a certain extent for pastures, comprise approximately 23 percent of the area of the county. The remaining 27 percent represents steep, hilly, and badly broken areas that are mainly in forest and include only a few small cultivated patches.

The present-day agriculture consists of the production of cotton as the main cash crop, with corn, oats, hay, sweetpotatoes, and truck crops grown mainly for subsistence.

The soils of Macon County include a large number of distinct soil types and phases, which vary widely in texture, structure, and chemical content. The soils have been classed in 10 major groups.

The soils of the first group, comprising 11.4 percent of the area of the county, have sandy surface soils and yellow or red friable sandy clay subsoils. These include the sandy loams and fine sandy loams of the Norfolk, Sawyer, Ruston, Faceville, Orangeburg, Red Bay, Kalmia, Izagora, Cahaba, and Amite series. They are the most friable, the best developed, the most easily tilled, the most suitable for diversified farming, the most responsive to management, and the most desirable soils for general farm crops in the county.

Soils with brown surface soils and friable subsoils on first or second bottoms constitute the second group and represent 3.3 percent of the area of the county. Congaree silt loam, Congaree loamy fine sand, Ochlockonee silt loam, Wickham silt loam, Augusta silt loam, and Jamison fine sandy loam comprise this group. These soils are considered the best soils in the county for corn, sorgo, and hay crops. A major part of each of them is in cultivation.

Soils with sandy surface soils and yellow or reddish-brown compact subsoils comprise 4.6 percent of the area of the county. These soils are sandy loams and fine sandy loams of the Gilead, Shubuta, Luverne, Flint, and Wickham series. They constitute an important group of soils as regards tillage, suitability for diversified crops, and response to management.

Soils with sandy surface soils and mottled heavy plastic clay subsoils comprise 9.5 percent of the area of the county. The members of this group are the fine sandy loams and very fine sandy loams of the Susquehanna, Macon, Vaiden, Oktibbeha, and Leaf series. These soils warm slowly in the spring, are subject to sheet erosion—except the Leaf soils—and are strongly acid in reaction. They can be farmed satisfactorily under favorable moisture conditions, but as a rule they are not so easily tilled as Norfolk or Ruston sandy loams. They are used to a large extent for the production of cotton and oats and to a less extent for pasture.

Calcareous heavy clay soils, or the so-called Black Belt soils, constitute 1.7 percent of the area of the county. This group includes Houston clay, shallow phase; Sumter clay; and Bell clay. All these soils are neutral to alkaline in reaction in the surface soils and alkaline in the subsoils. They require strong work animals for their most satisfactory tillage, and all except Bell clay are very subject to sheet erosion. They are used largely for pasture and hay crops, although corn and sorgo are often grown.

Soils with heavy clay surface soils and mottled heavy plastic clay subsoils represent 7.2 percent of the area of the county, not including the slope, eroded, or hilly phases, which are in another group. They are represented by clay members of the Susquehanna, Oktibbeha, Vaiden, and Eutaw series. Their high clay content makes them difficult to till, requiring strong work animals; and farm operations are delayed in the spring pending favorable moisture conditions for their most satisfactory tillage. These soils check and crack badly on drying, are very acid in reaction, and require a large quantity of lime for their neutralization. Phosphatic fertilizers are fixed readily when placed in contact with the soils.

Sands, fine sands, and loamy sands of the Norfolk, Kalmia, and Cahaba series cover 9.8 percent of the area of the county. The soils are extremely sandy, can be tilled with light equipment, and are the earliest on which farm operations can be started. On the other hand, they are very subject to leaching of the plant nutrients, and an insufficient supply of moisture is retained for the production of large yields of summer-growing crops. They are used principally for general farm and truck crops, except the slope phases of the Norfolk series, which are used largely for forestry.

Soils with shallow sandy surface soils and yellow or reddish-brown compact subsoils represent 6.2 percent of the area of the county. These soils are droughty for summer-growing crops. Gilead sandy

loam, eroded phase; Chesterfield sandy loam; Cuthbert sandy loam, eroded phase; Altavista fine sandy loam; Wickham fine sandy loam, thin surface soil phase; and Flint fine sandy loam, eroded phase, are in this group. These soils are used largely for the production of cotton and oats.

Poorly drained soils of the first and second bottoms are extensive, covering 24.2 percent of the area of the county. Roanoke silt loam; Myatt fine sandy loam; Iuka silt loam; Kaufman clay; Bibb silt loam; Bibb fine sandy loam; alluvial soils, undifferentiated; swamp; and riverwash are members of this group. Poor drainage and frequent overflows handicap the utilization of these soils for farm crops. They are used principally for forestry and pasture, although some areas have been cleared, drained, and utilized for corn, sorgo, and soybeans. Potentially these are good soils, but they require artificial drainage.

Soils of eroded and sloping areas and steep hilly land constitute 22.1 percent of the area of the county. This group comprises the eroded slope phases of Gilead sandy loam, Chesterfield sandy loam, Cuthbert sandy loam, and Gilead-Cuthbert sandy loams; the slope phases of Susquehanna clay and Oktibbeha clay; Cecil sandy loam, eroded hilly phase; Vaiden-Susquehanna clays; Vaiden-Susquehanna clays, steep phases; and steep hilly land (Gilead-Cuthbert soil materials). These soils and land types have a sloping to hilly relief and are mixed in character. The surface soils are shallow, and the subsoils are compact or heavy plastic clay. These soils are very subject to erosion. They are used largely for forestry.

○

Accessibility Statement

This document is not accessible by screen-reader software. The U.S. Department of Agriculture is committed to making its electronic and information technologies accessible to individuals with disabilities by meeting or exceeding the requirements of Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended in 1998. Section 508 is a federal law that requires agencies to provide individuals with disabilities equal access to electronic information and data comparable to those who do not have disabilities, unless an undue burden would be imposed on the agency. The Section 508 standards are the technical requirements and criteria that are used to measure conformance within this law. More information on Section 508 and the technical standards can be found at www.section508.gov.

If you require assistance or wish to report an issue related to the accessibility of any content on this website, please email Section508@oc.usda.gov. If applicable, please include the web address or URL and the specific problems you have encountered. You may also contact a representative from the USDA Section 508 Coordination Team.

Nondiscrimination Statement

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the

Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by:

(1) mail: U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

(2) fax: (202) 690-7442; or

(3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.