Soil Survey
of
Lauderdale County, Alabama

By
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Bureau of Chemistry and Soils
In cooperation with the
Alabama Department of Agriculture and Industries

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SOIL SURVEY OF LAUDERDALE COUNTY, ALABAMA

By A. L. GRAY, in Charge, and W. E. THARP, United States Department of Agriculture, and M. E. STEPHENS and L. C. BRACKEEN, Alabama Department of Agriculture and Industries

COUNTY SURVEYED

Lauderdale County is situated in the extreme northwest corner of Alabama, adjoining Tennessee (fig. 1). Tennessee River separates it from Colbert and Lawrence Counties, Ala., on the south, and from Tishomingo County, Miss., on the west. The greatest length of the county from east to west is 57 miles, and its greatest width from north to south is nearly 20 miles. The total area is 694 square miles, or 444,160 acres.

Physiographically, Lauderdale County is located within the well-known Tennessee Valley, and it presents a variety of surface features which have a direct bearing on the soils and agricultural interests. There are three important topographic divisions in this county, namely, the limestone valley, the plateau section, and the river-flood plains. The limestone valley—that is, the so-called “red-land part”—extends along Tennessee River from Elk River on the east to a point near Gravelly Springs on the west. It ranges in width from north to south from about 3 miles at the narrowest point to 7 miles in the western part. This valley has an undulating, gently rolling, and rolling surface relief, and it ranges in elevation from about 450 to about 750 feet above sea level. Between Florence and Smithsonia, in the bend of the river, is the smoothest surface relief of the valley section, as it

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ranges from undulating or gently rolling to gently sloping in many places. East of Florence this section becomes more rolling. This valley is the result of erosion by Tennessee River, which has removed the former covering of sandstone and shale and exposed the underlying limestone.

The plateau section lies north of the limestone valley and extends in an east-and-west direction across the county. Owing to stream action, there are wide variations in the surface relief of this section. The largest areas having an almost level to undulating or gently sloping relief are in the vicinity of Lexington, south and east of Grassy Church, around Greenhill and Bush Arbor School, southeast of Mount Tabor Church, and east of Cloverdale. The highest elevation in this section is about 850 feet. Areas having the roughest and most broken surface relief are in the western part of the county, beginning about 2 miles east of Gravelly Springs and continuing to the northwest corner. In this locality the surface relief is characterized by narrow winding ridges and knolls with steep sides. Other large areas of rough, broken surface relief, which have a slope ranging from 15 to 40 percent, lie on both sides of Shoal, Richard-son, and Second Creeks, and narrow areas of rough broken land are developed along Cypress Creek. In this former plateau section the larger streams have cut deep narrow gorges. In places the streams are flanked by very steep slopes and in some places by perpendicular walls ranging from 50 to 100 or more feet in height.

Along Tennessee River and some of the larger creeks are areas of first and second bottoms ranging in width from 100 feet to as much as 1 1/4 miles. These areas have level or undulating surface relief. Slight depressions or sinks are conspicuous throughout all parts of the county, with the exception of the northwest corner. These depressions are not only prominent in appearance but are important from the point of view of drainage.

Tennessee River, together with its tributaries, serves as the main drainage system for the county. The general slope is to the south. Some of the creeks, particularly Shoal, Cypress, Bluewater, and Anderson, have cut deep narrow valleys from 50 to 200 feet below the general level of the uplands. With the exception of the sinks and slight depressions and some of the lower lying areas along some creeks, the land has good natural surface drainage. In many places in the valley there are very few streams, and much of the land is drained through subterranean channels. Numerous springs of pure water flow from the hills in the plateau section, and in this same section water can be obtained from wells ranging from 25 to 40 feet in depth, whereas in the valley section the wells are from 60 to 120 feet in depth. Many of the farmers and tenants depend largely on cisterns for their supply of drinking water. Artificial ponds hold water for cattle.

Soft chert gravel and angular fragments occur in great quantities in the hills and on many of the steep slopes. These materials, which are easily obtained, make good road-surfacing material. Many miles of roads have been improved by this means.

Lauderdale County was established during the territorial period of the State, and its organization was completed on the admission of Alabama into the Union as a State in 1818. The county was named in honor of Col. James Lauderdale, the gallant Tennessean who was
killed in a night attack by the British, below New Orleans, on December 23, 1814. This county was one of the first places in Alabama settled by white people, the earlier settlers coming from Virginia, the Carolinas, and eastern Tennessee. The first settlements were made along Tennessee River, principally on the areas of the red soils. Scattered settlements were made along Cypress, Shoal, Bluewater, and the other large creeks. In about 1870 a colony of Germans settled at St. Florian.

Florence, the county seat, was laid out in 1819 for the Cypress Land Co., the developers of the region, by a young Italian engineer who was allowed to name the new town after his native city. Until about 1870, when the Muscle Shoals Canal was built, Florence was the head of navigation on Tennessee River.

The 1930 census gives the population of Lauderdale County as 41,130. Of this number, 29,401 are classed as rural and 11,729 as urban. Florence represents the total urban population. Important but much smaller towns are Rogersville with a population of 445 and Waterloo with a population of 497. Among the several small villages and country settlements are Anderson, Lexington, Green Hill, Pruittton, and Cloverdale.

Water transportation is furnished by Tennessee River. Although the system is not well organized, it has potential capabilities for great development. A branch line of the Louisville & Nashville Railroad crosses the county from north to south. Freight cars from the Southern Railway at Sheffield are switched over to Florence. United States Highway No. 43 passes north and south through Florence. A highway system of gravel roads radiates in all directions from Florence and furnishes easy access to all parts of the county. The Lee Highway (United States Highway No. 72) connects Florence with Athens and Huntsville, to the east, and with Corinth, Miss., to the west.

Rural mail delivery routes have been established throughout the county. All the towns and villages and even a few of the farms have telephone service. An excellent system of consolidated schools furnishes good educational facilities for high-school students, although in some sections the common schools are still used by the local communities. The coeducational State teacher's college is located at Florence. There is a wagon manufacturing company at Florence, which has a large output.

The Wilson Dam has been built across Tennessee River at Muscle Shoals, about 3 miles east of Florence. The water level of Lake Wilson is 505 feet above sea level. About 260,000 horsepower of electrical energy has been developed. When the Wheeler and Norris Reservoirs are completed, approximately 650,000 horsepower can be developed at the Wilson Dam. Additional power to the extent of about 245,000 horsepower may be developed at the Wheeler Dam. The elevation of the water level in Wheeler Lake will be 555 feet. With this hydroelectric development, cheap electricity is practically assured. The nitrate plant in Colbert County, just east of the Wilson Dam, is manufacturing fertilizer.

Florence is the principal market for the products of Lauderdale County. Most of the cotton is sold here and later shipped to distant mills, but two local mills consume a rather large quantity. A large quantity of garden vegetables, potatoes, dairy products, and poultry finds ready sale in Florence. Cream stations are established at An-
derson and Lexington, and the cream is then shipped to Lawrenceburg and Nashville, Tenn. Potatoes are carried by truck to Sheffield and thence shipped to Birmingham and more distant markets.

**CLIMATE**

Lauderdale County is located in the warm temperate zone. The climate may be considered continental, as the county is too far inland to be greatly affected by the tempering influences of the ocean. The mean annual temperature is 60.7° F. Temperatures vary widely, however, a low of −13° and a maximum of 108° being the extremes recorded by the Weather Bureau.

The average date of the last killing frost is April 3 and of the first is October 28, giving an average frost-free season of 208 days. Killing frosts, however, have occurred as late as May 2 and as early as October 9.

The mean annual rainfall is 51.58 inches which is sufficient for the growth and development of all the crops commonly grown. The heaviest precipitation occurs during the winter and early spring; and the lightest rainfall is in late summer and fall, a condition favorable for the maturing and harvesting of all crops. Frequently, during the summer months, heavy rains fall within a short period. The average annual snowfall is only 4.6 inches.

Table 1, compiled from records of the United States Weather Bureau station at Florence, gives the more important climatic data for this county.

**Table 1.—Normal monthly, seasonal, and annual temperature and precipitation at Florence, Lauderdale County, Ala.**

[Elevation, 585 feet]

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean °F</td>
<td>Absolute max. °F</td>
</tr>
<tr>
<td>December</td>
<td>42.4</td>
<td>75</td>
</tr>
<tr>
<td>January</td>
<td>41.1</td>
<td>82</td>
</tr>
<tr>
<td>February</td>
<td>43.0</td>
<td>82</td>
</tr>
<tr>
<td>Winter</td>
<td>42.2</td>
<td>82</td>
</tr>
<tr>
<td>March</td>
<td>51.9</td>
<td>90</td>
</tr>
<tr>
<td>April</td>
<td>60.8</td>
<td>91</td>
</tr>
<tr>
<td>May</td>
<td>68.9</td>
<td>98</td>
</tr>
<tr>
<td>Spring</td>
<td>60.5</td>
<td>76</td>
</tr>
<tr>
<td>June</td>
<td>76.8</td>
<td>108</td>
</tr>
<tr>
<td>July</td>
<td>79.3</td>
<td>104</td>
</tr>
<tr>
<td>August</td>
<td>78.5</td>
<td>103</td>
</tr>
<tr>
<td>Summer</td>
<td>78.2</td>
<td>108</td>
</tr>
<tr>
<td>September</td>
<td>73.6</td>
<td>103</td>
</tr>
<tr>
<td>October</td>
<td>61.5</td>
<td>97</td>
</tr>
<tr>
<td>November</td>
<td>50.8</td>
<td>88</td>
</tr>
<tr>
<td>Fall</td>
<td>61.8</td>
<td>103</td>
</tr>
<tr>
<td>Year</td>
<td>60.7</td>
<td>103</td>
</tr>
</tbody>
</table>

1 Trace.
A slight difference prevails in the temperature in the various parts. The nights are cooler in the higher sections than in the lower parts of the Tennessee Valley. The cool climate of the county as a whole affects to some extent the boll weevil, and its ravages on cotton are not so serious as in the southern part of the State. It is reported that the red lands in the Tennessee Valley warm up earlier in the spring than the gray lands of the northern part of the county, thus giving approximately a week longer growing season in the lower part of the valley than in the highest part of the county.

The climate is favorable for the production of vetch, Austrian winter peas, oats, wheat, and rye during the winter. Winter vegetables, such as cabbage, collards, turnips, beets, onions, and radishes, may be grown during an open winter and in early spring. With the exception of rainy days, farm work may be carried on throughout the greater part of the year.

**AGRICULTURAL HISTORY AND STATISTICS**

There has been no revolutionary change in the agriculture of Lauderdale County since farming began shortly after the beginning of the last century. The early agriculture consisted of the growing of general farm crops, such as corn, wheat, oats, sorgo, and garden vegetables, and the raising of cattle and hogs. In 1818 the Cypress Land Co. was organized to sell large tracts of land acquired from the Federal Government. Large plantations were sold to planters from Virginia and the Carolinas, and cotton farming began as soon as the land was cleared. Cotton has continued to be the principal cash crop.

Although there has not been a great change, there has been an important trend toward an increase in cotton production at the expense of subsistence crops, principally corn and forage crops. Formerly, wheat held an important place in the agriculture of the county and supplied a large part of the local needs for flour. In 1879 there were 8,475 acres sown to wheat, whereas in 1929 there were only 339 acres. Oats have shown a similar decrease in both acreage and production, but the production of corn has steadily increased. In 1879, 26,594 acres were planted to cotton, and in 1929, 79,241 acres were devoted to this crop.

In the early days cattle and hogs ran at large on the open range. The oak forests throughout the greater part of the county furnished considerable mast for the hogs. The cattle which ran at large over the northern part of the county were driven in the fall to the Tennessee River bottoms to winter in the cornfields and canebrakes. Improved Jersey cattle have been imported, and there are now large numbers throughout the county. On the red soils very few of the tenants keep milk cows. The number of beef cattle has not shown a marked increase, and the raising of beef cattle is relatively unimportant. Poland China and Duroc-Jersey hogs have been brought in but not in sufficient numbers to supply the home needs and the local markets for meat and lard.

Farming in the northern part of the county has been on a different basis from that in the southern part. In the northern part small farms and subsistence farming, with cotton as a cash crop, were the rule until comparatively recent times. Since 1930 approximately
1,000 acres of new land have been brought under cultivation annually in this section. In the southern part large buildings are common, cotton dominates the cropping system, and the type of agriculture is characteristically southern.

The colony of Germans who settled at St. Florian in 1870 confined their farming operations to comparatively small acreages and gave the soil careful cultivation. These people have grown little cotton but have given especial attention to the products with which they were more familiar, such as grains, truck crops, potatoes, and small fruits.

Table 2 shows the trend in agricultural development and changes in crop acreages from 1879 to 1929.

<table>
<thead>
<tr>
<th>Crop</th>
<th>1879</th>
<th>1889</th>
<th>1899</th>
<th>1909</th>
<th>1919</th>
<th>1929</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>44,890</td>
<td>39,239</td>
<td>48,168</td>
<td>51,590</td>
<td>60,785</td>
<td>15,4879</td>
</tr>
<tr>
<td>Oats</td>
<td>2,445</td>
<td>1,411</td>
<td>2,942</td>
<td>369</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>8,475</td>
<td>7,792</td>
<td>6,576</td>
<td>1,938</td>
<td>1,535</td>
<td>2,631</td>
</tr>
<tr>
<td>Potatoes</td>
<td>114</td>
<td>460</td>
<td>460</td>
<td>690</td>
<td>765</td>
<td></td>
</tr>
<tr>
<td>Sweetpotatoes</td>
<td>67</td>
<td>231</td>
<td>166</td>
<td>338</td>
<td>472</td>
<td>468</td>
</tr>
<tr>
<td>Hay</td>
<td>238</td>
<td>371</td>
<td>2,437</td>
<td>8,394</td>
<td>16,258</td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>26,994</td>
<td>25,552</td>
<td>25,326</td>
<td>43,391</td>
<td>49,488</td>
<td>79,341</td>
</tr>
</tbody>
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1 Harvested for grain. Corn from a small acreage was cut for silage or fodder or was hogged off.

According to the census data, the number of farms in Lauderdale County gradually increased between 1880 and 1930, from 2,657 to 5,246. The preliminary tabulations of the 1935 Census of Agriculture reports 5,170 farms, including 367,941 acres, on January 1 of that year. As the number of farms increased the size decreased. The average-sized farm in 1880 was 145 acres, and in 1930 it was 56.3 acres. The number of farms has practically doubled, and so has the amount of land in cultivation. From 1880 to 1930 there was a steady increase in the value of farm property.

A steady decrease in the number of farms operated by owners and a corresponding increase in those operated by tenants have taken place. Owner operation dropped from 58.5 percent in 1880 to 37.1 percent in 1930, and tenant operation during the same period increased from 41.5 percent to 62.9 percent.

Three systems of land rental are in use. About 60 percent of the land is rented for one-third of the corn and hay and one-fourth of the cotton produced; about 20 percent of the rented land is rented on a cash basis, at an acre rate ranging from about $3 to $5, depending on the character of the soil, its location, and the crops grown. The rest is rented on the share basis, whereby the tenant performs all the farm work, and the landowner furnishes the work animals, feed for the work animals, implements, and one-half of the fertilizer and seed, in return for which he receives one-half of the crops grown.

Throughout the county, especially on the owner-operated farms, are many houses of modern construction, and there are a few beautiful old mansions. On some of the large farms there is one large
house and a number of tenant houses. The latter are generally small and of poor construction. The greater part of the tenant farmer’s machinery is of the one-horse type. On most of the owner-operated farms two-horse plows, cotton and corn planters, grain drills, and cultivators are in use. A few tractors are used on some of the larger farms. The work animals are largely mules.

The use of commercial fertilizers has steadily increased. According to information furnished by the State department of agriculture and industries, 6,000 tons of fertilizer were used in Lauderdale County in 1931. Of this, 85 percent was ready mixed, and only 151 tons represented separate ingredients for home mixing or for side dressing. The greater part of the ready-mixed fertilizers are of three formulas, 3–10–3, 4–8–4, and 4–10–4.1 Owing to the low price of agricultural products, fertilizer sales for 1932 dropped off sharply.

Farm labor, both white and colored, is plentiful, except in localities affected by industrial works. On many farms, especially in the grayland section, the farmers, with the assistance of their immediate families, perform the greater part of the farm work. The average daily rate paid for ordinary farm labor is $1, and the monthly wage ranges from $15 to $20, in addition to a house, garden lot, firewood, and other considerations. In some instances, white boys are employed during the cropping season and are paid the monthly wage, in addition to board, room, and laundry.

Prices of land vary according to the character of the soil, the improvements thereon, and the location with respect to towns, markets, and good roads. The Red soils in the valley, such as the Dewey and Baxter soils, command a fair to good price, and some of the choice first-bottom land has sold at much higher figures. The greater part of the gray lands mapped as Dickson, Savannah, and associated soils brings a fair price, but some of the areas having poorer internal drainage sell at a very low figure. The rough broken hill country in the northwestern part of the county and the stony and steep areas throughout all parts, which are suited only for forestry, are held at a nominal figure, unless there is a growth of merchantable timber which, in itself, determines the value.

SOILS AND CROPS

Lauderdale County lies wholly within the Tennessee River drainage basin, in the northwest corner of Alabama. It is considered a limestone-valley county, although the northwest corner is termed the gray-hills and gray-land section. The greater part is included in the limestone-valley section of the State. With the exception of a few small areas along the streams and numerous small local ponds or sinks, all the land is naturally well drained. The surface relief ranges from undulating and gently rolling to rolling, broken, and hilly. Broad and comparatively level areas lie between the larger drainageways. About 60 percent of the county is characterized by surface features especially favorable for agricultural operations; about 15 percent is rolling to sloping; and the rest, or about 25 percent, is too rough and broken for farming operations and should be utilized for forestry.

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1 Percentages, respectively, of nitrogen, phosphoric acid, and potash.
Most of the original growth of merchantable timber has been cut, but there is a considerable amount of second and third growth, which is now being cut by the several small portable sawmills. Much of it is used for crossesies. Pine was the principal original growth in the northwestern corner of the county, and even in this section there were numerous hardwoods. All other sections were forested mainly to hardwoods and a few pines. The principal trees were white, Spanish, red, scarlet, post, and bur oaks, together with hickory, chestnut, walnut, tuliptree (locally known as tulip poplar), dogwood, sourwood, and persimmon. In the river and creek bottoms, gums, ironwood, hackberry, beech, soft maple, tuliptree, elm, ash, cottonwood, water oak, hickory, and sycamore constituted the original growth.

The agriculture of this county is built around the production of cotton. Corn is the second crop in importance, and hay occupies the third largest acreage.

Cotton is and always has been the dominant cash crop because of the favorable climate, adaptability of the soils for the production of this crop, and a plentiful supply of cheap labor. The cash returns from cotton have been larger and the profits greater than from any other crop suitable to this locality. Possibly because cotton farming lends itself to the tenant system, much of the red land is held in large tracts and operated in this manner. Cotton is grown on practically all of the agricultural soils, except those in the first bottoms which are subject to overflow. The red upland soils having a shallow surface soil, however, are the best suited to the production of this crop. The ravages of the boll weevil have not been so severe in this locality as they have been farther south in the State. The damage from the boll weevil is not so severe to cotton grown on the red soils as to that on the gray soils, because the red soils warm up slightly earlier in the spring and mature the bolls before the boll weevil arrives.

Corn is grown to more or less extent on every soil in the county. It is produced mainly as a subsistence crop, that is, for the feeding of work animals, fattening of hogs, and grinding into meal for home use. The fertile soils of the first bottoms, largely Huntington silt loam, produce large yields of corn, and this crop, together with hay crops, is grown almost to the exclusion of all other crops and is, therefore, a cash crop on some of the river-bottom farms. When the first-bottom lands are flooded as a result of the construction of the Wheeler and Pickwick Dams, the chances are that much less corn will be produced in the county than at present. More corn is grown on the Dickson and Baxter soils than on the red soils, particularly the Dewey, in the valley, and these are prospective corn soils when the bottom lands are submerged. In some sections not enough corn is produced for local needs.

Considerable hay, mainly cowpea and soybean, is produced. There has been a decided increase in the acreage sown to winter cover crops within the last few years. Hairy vetch and Austrian winter peas are the principal crops sown for this purpose, and crimson clover has a promising future as a cover crop. In 1934 there were 20,000 acres sown to lespedeza. The main varieties are Kobe and Tennessee 76, and these varieties seem admirably suited to the soils of this
county and give promise of greatly improving the soil if sown more extensively. Several thousand pounds of seed are produced annually.

Around every well-established home a few hogs, milk cows, and, in a few localities, some sheep are raised. Garden vegetables are grown for home use, and the surplus is sold. Fruit trees, although not prevalent over the county, are seen here and there. Sweet-potatoes are grown for home use and for local markets. Sorgo, in small patches, is grown throughout the county, and from this sorgo sirup is made.

The potatoes produced for market are grown largely in the vicinity of the German settlement at St. Florian. They are shipped to Birmingham and other markets. Some farmers plant a late crop of potatoes for home use and for sale on the Florence market.

Very few beef cattle are raised, and not all the farmers, especially the tenant farmers, keep milk cows. Jerseys and some good mixed breeds are the principal dairy cows. There are a few small dairies in the county. Many of the best farmers produce more milk than is needed for home use, and the excess is sold. Dairying seems to be on the increase. Hog raising is not increasing, but many farmers raise enough meat for their own use. Sheep do well, but only a few flocks are kept.

The same general farm crops are grown on all the well-drained soils to more or less extent in all parts of the county. Therefore, no grouping of the soils can be made strictly on the type of agriculture practiced. The large number of soil types mapped can be grouped on the basis of the characteristics of the soils, and on this basis, the soils naturally fall into two main groups, in addition to a group of miscellaneous soils and classifications of material, as follows: (1) Red-soil group, (2) gray-soil group, and (3) miscellaneous soils and land types.

An excavation in a soil reveals a series of layers, or horizons, called collectively the soil profile. The character of the profile, together with such general features as drainage, relief, and stoniness, determine how the soil is classified. The characteristics and properties of the soil taken into consideration by the soil survey are those that can be determined by simple tests in the field.

In soil classification in the United States, the soil series is the fundamental unit. The series are divided into types on the basis of the texture of the surface soil, and the types into phases, according to minor variations, such as differences in stoniness and relief, that are of importance in land use but are not actual soil differences. Most important is the series which includes soils having essentially the same color, structure, thickness of the several horizons, relief, drainage, and approximately the same parent material. The series are given geographic names taken from the location in which the included soils were first recognized. The types within the series are named according to the texture of the surface soil, as sand, sandy loam, or clay. The texture name added to the series name gives the complete name of the type. For example, in this county Dewey is the name of a series, Dewey gravelly loam, that of a soil type, and Dewey gravelly loam, slope phase, that of a phase, or slight variation from the typical soil.

In the following pages, the soils of Lauderdale County are described in detail, and their agricultural relationships are discussed;
their distribution is shown on the accompanying soil map; and table 3 gives their acreage and proportionate extent.

Table 3.—Acreage and proportionate extent of the soils mapped in Lauderdale County, Ala.

<table>
<thead>
<tr>
<th>Type of soil</th>
<th>Acres</th>
<th>Per cent</th>
<th>Type of soil</th>
<th>Acres</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dewey loam</td>
<td>66,176</td>
<td>14.9</td>
<td>Dickson gravelly silt loam, slope phase</td>
<td>37,092</td>
<td>8.6</td>
</tr>
<tr>
<td>Dewey silt loam</td>
<td>4,608</td>
<td>1.0</td>
<td>Savannah silt loam</td>
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<td>2.3</td>
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<tr>
<td>Dewey gravelly loam, slope phase</td>
<td>14,372</td>
<td>3.2</td>
<td>Atwood silt loam</td>
<td>5,440</td>
<td>1.2</td>
</tr>
<tr>
<td>Dewey gravelly loam, slope phase</td>
<td>32,192</td>
<td>7.3</td>
<td>Atwood silt loam, gravelly phase</td>
<td>2,496</td>
<td>0.6</td>
</tr>
<tr>
<td>Baxter loam, gravelly phase</td>
<td>27,712</td>
<td>6.2</td>
<td>Cuthbert very fine sandy loam</td>
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<tr>
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<td>Baxter stony loam</td>
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<td>Guthrie silt loam</td>
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<td>1.7</td>
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<tr>
<td>Elk silt loam</td>
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<td>Undside silt loam</td>
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<td>0.5</td>
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<tr>
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<td>Melvin silt loam</td>
<td>3,392</td>
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<tr>
<td>Cumberland silt loam</td>
<td>832</td>
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<td>Melvin silt loam, mixed phase</td>
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<td>2.4</td>
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<td>Huntington silt loam</td>
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<td>Guin very fine sandy loam</td>
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</tr>
<tr>
<td>Huntington silt loam, heavy silt, gravelly phase</td>
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<td>0.7</td>
<td>Guin very fine sandy loam, gravelly phase</td>
<td>8,576</td>
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<td>0.8</td>
<td>Guin soils, undifferentiated</td>
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</tbody>
</table>

**RED-SOIL GROUP**

The red-soil group includes all the soils of the Dewey series, Baxter loam, Baxter loam, gravelly phase, and the associated soils developed on the terraces and in the first bottoms, including the Abernethy, Elk, Cumberland, and Huntington soils.

The soils in this group are the most inherently fertile and productive soils in the county. They occur in all parts, with the exception of the extreme northwest corner, and the largest areas are in the central, southern, and eastern parts. These soils have favorable surface features and, with the exception of those developed in the first bottoms, are naturally well drained.

The red soils begin at the eastern end of the county and extend to a point about 2 miles east of Gravelly Springs, occupying a strip ranging from about 3 to 8 miles in width paralleling and bordering Tennessee River. Scattered areas occur in other parts, particularly around Lexington and Central High School. These soils are locally known as the "red-limestone soils of the Tennessee Valley." With the exception of the alluvial soils (overflow bottom lands), these soils have been formed through soil-forming processes from weathered limestone and cherty limestone.

These soils are characterized by their brown or red color in the surface soils, and they have reddish-brown or red friable or rather stiff clay subsoils. Associated with them are the Elk, Abernethy, and Huntington soils which have brown surface soils and brown subsoils. The surface soils are mellow and friable, are very easy to cultivate, can be farmed with improved machinery, and have the physical properties which enable them to absorb and retain sufficient moisture for the growing of crops. These soils are superior in some respects to the gray soils. They can be built up to a high state of productivity, which is easily maintained by crop rotations, including the turning under of green-manure crops and the addition of barnyard manure.
Where improperly managed the Dewey and Baxter soils have been subjected to considerable sheet erosion, and in many places part of or even all the original surface soil may have been removed. These soils, however, especially the subsoils, are deep to the parent rock and, therefore, can stand much more erosion with less detriment than can most of the gray soils, which are comparatively shallow to bedrock.

The red soils were the first in the county to be farmed on an extensive scale. Large plantations are seen throughout the valley section, and the acreage of the individual holdings is larger than in the northern part of the county on the gray soils. The tenant system prevails in the valley part, as a large number of the landowners live in town. Therefore, the type of farming and the handling of the red soils are different in some respects from those practiced on the gray soils.

Cotton is the principal crop grown on the red uplands. Corn is grown to less extent and is used primarily as a subsistence crop. On the red lands less attention is given to fruit trees, to the production of garden vegetables, and to any general crop rotation than is practiced on the gray soils. This is due mainly to the extensive tenant system, as most of the red lands are farmed by Negroes. Such a condition militates against the white farmer buying and operating a small farm in this locality. With the exception of the main plantation houses, the buildings and improvements on the red lands are not so good as those on the gray lands.

The Abernethy and Huntington soils, which occur in the swales and along the streams, are the principal soils in the county used for corn and hay, and they are used almost exclusively for the production of these two crops.

**Dewey loam.**—Dewey loam, locally known as the "red land" of the limestone valley, is distinguished by its brown or reddish-brown color. It is the most important agricultural soil in the valley part of the county. The surface layer is brown or reddish-brown loam from 4 to 8 inches thick, containing a large quantity of silt, some fine sand and very fine sand, and a small amount of clay. It is mellow and friable. It passes gradually into a subsurface layer of light-red or reddish-brown silty clay loam, and this, at a depth ranging from about 12 to 15 inches, grades into reddish-brown clay which extends to a depth of about 24 inches, where it changes gradually into light brownish-red or red clay. This clay breaks into irregularly shaped lumps, is uniform in color, and, under favorable moisture conditions, is easily crushed into a friable granular mass. This material continues to a depth ranging from 3 to 8 feet, where it grades into light brownish-red and yellow moderately friable clay containing some almost white soft chert particles. In the subsoil are a few very small soft black specks or rounded accretions. Dewey loam and Dewey silt loam have the deepest subsoils of the upland soils in this county.

In the vicinity of Smithsonia and eastward toward Florence, the surface soil of Dewey loam is more brown or redder than the surface soil in areas east of Florence. In some places the surface soil consists of brown loam to a depth of 3 or 5 inches and is underlain by reddish-brown or dark-red rather heavy clay. These areas have the characteristics of Decatur clay loam as mapped in
many places in the Tennessee Valley. This variation occurs mainly on the low gently sloping sides of ridges where surface erosion has been active. Between Florence and Smithsonia are areas in which the dark-brown silt loam extends to a depth of 12 or 15 inches, but they were too small to separate on the map as Dewey silt loam.

In the vicinity of Houstontown and south of Center Star, on some of the knolls and ridges, the surface soil, to a depth ranging from 2 to 6 inches, is light-brown or brown fine sandy loam. The subsoil is red or reddish-brown moderately friable clay loam or clay. Such areas are small and intricately mixed with areas of Dewey loam. The soil in these included areas is very easy to till, warms up quickly in the spring, and is well suited to the production of melons, garden vegetables, and fruits, and yields of cotton are about the same as those obtained on Dewey loam. On account of the small extent of the areas having the sandy surface soil and of their irregular occurrence, they were not deemed of sufficient difference, agriculturally, to separate on the soil map from Dewey loam.

In the eastern part of the county the subsoil under Dewey loam is in most places more shallow, and in some places it contains small angular chert fragments. A few fragments are also present here and there on the surface, particularly on the areas having the most sloping surface relief, which have been subjected to surface erosion. In a few places, where very poorly managed, all the surface soil has been removed by surface wash, exposing the reddish-brown or red silty clay loam or clay. Such areas are locally spoken of as “galled spots.”

Dewey loam extends in a more or less broken area from the eastern end of the county and continues in the valley along Tennessee River to Gravelly Springs. It attains its greatest width between Oakland and Woodland, in the bend of the river. Some of the largest unbroken areas lie east of Smithsonia, north of Woodland, north of Florence, in the vicinity of St. Florian, and south of Center Star. Isolated areas occur in the northern and northeastern parts of the county.

The surface relief ranges from undulating or gently rolling to rolling, with here and there some long gentle slopes. The areas west of Florence, particularly in the vicinity of Smithsonia, have in general slightly smoother surface relief than areas east of that city. Natural surface drainage of all areas of this soil is good, and internal drainage is also good, as is shown by the uniformly red color in the subsoil. Most of the surface water flows away through the small natural drainageways, but there are also many subterranean channels which afford drainage for a considerable part of the soil.

Water for cattle is obtained from deep wells, springs, creeks, and a few ponds. Well water is rather difficult to obtain at a reasonable depth, therefore many of the farmers have cisterns, especially in the bend of the river, where many farmers on Dewey loam depend, for their drinking water, on the accumulation of it in the cisterns.

Sheet erosion has been active on this soil, and as a result much of the original surface soil has been removed and carried away by streams, but some of it has been deposited in the sinks and depressions to form Abernethy silt loam, light-colored phase. Many areas
of Dewey loam would be benefited by terracing and strip cropping to prevent further sheet erosion. Fortunately, the subsoil of Dewey loam, where exposed by erosion or otherwise, if handled correctly, can be made productive by the incorporation of organic matter and by applying phosphate. The Dewey soil has this advantage over soils having the more shallow subsoils. Unless surface erosion on Dewey loam is checked through improved management, much of the original surface soil will be washed away.

A large part of this land has been cleared and farmed for a long time. The original forest growth was mainly hardwood. A few small areas of second-growth old-field pine were observed during the course of the survey.

Cotton is the principal crop grown, and this crop fits well into the present system of tenant farming, as much of the Dewey loam is held in large tracts, and on these the tenant system prevails. Yields of cotton range from one-fourth to 1 bale an acre, with an average of about 180 or 200 pounds of lint cotton. The cotton is fertilized with applications ranging from 200 to 500 pounds to the acre of 4-10-4, 4-8-4, or 3-10-3. The better farmers use the larger applications. A few of the farmers side dress their cotton with an acre application ranging from 100 to 150 pounds of nitrate of soda or its equivalent, in addition to the base application. When a side dressing is not used, a 6–8–4 is recommended.

Compared with cotton, corn occupies a small acreage. Corn yields range from 10 to 35 bushels an acre. Many farmers do not fertilize their corn, but where it is fertilized they apply from 100 to 200 pounds of nitrate of soda to the acre.

Soybeans and cowpeas are grown both for green feed and for hay. These crops do well, but are not grown on a large acreage. Kobe lespedeza grows well on this soil. Native lespedeza is used largely for pasture. A good pasture mixture consists of Kentucky bluegrass, orchard grass, redtop, black medic, hop clover, and lespedeza. Austrian winter peas and vetch are grown as winter cover crops. Some oats and wheat are grown on small acreages. These crops were formerly grown extensively and could be grown again successfully.

Potatoes, especially in the St. Florian locality, are produced for market. The main variety is Triumph, but some red-skinned varieties and Irish Cobbler are grown. Potatoes receive a heavy application of a high-grade fertilizer. Apples, peaches, and grapes do well. Garden vegetables of many varieties are produced around the best farm homes.

Dewey loam is inherently a good soil capable of being built up to a high state of productivity. Like all the soils in this county, it is deficient in organic matter, and this can best be supplied by barnyard manure. Very little manure is available, however, and, therefore, the organic matter should be supplied by turning under green-manure crops. Deeper plowing and better preparation of the seed bed, thus allowing the soil to absorb more of the rainfall and hold more moisture for growing crops, proves beneficial on this soil. Less surface erosion would take place if more of the rainfall could be absorbed by the soil and if strip cropping, mainly to grass, on some of the slopes were practiced. Some farmers find that Dewey loam is improved by the application of lime, especially where leguminous crops are to be grown.
Dewey silt loam.—Although Dewey silt loam occupies a small acreage, it is one of the best upland soils in Lauderdale County. It occurs in a few small areas in the bend of the river between Florence and Smithsonia. The surface relief ranges from almost level or undulating to gently sloping, and all the land is naturally well drained.

The 5- to 8-inch surface layer of Dewey silt loam is mellow friable brown silt loam. It grades into light reddish-brown or red heavy silt loam which is heavier than the material in the layer above but is friable under ordinary moisture conditions. This material continues to a depth of about 16 inches, where it is underlain, to a depth ranging from 36 to 50 inches, by dark-red silty clay or clay, which breaks into irregularly shaped lumps but is fairly easily crushed into smaller soil particles. Below this is dark-red rather stiff hard silty clay containing faint mottlings of yellow and gray. In most places, at a depth ranging from 60 to 70 inches, the red clay becomes more friable and contains more gray speckings or mottlings, together with some soft chert particles. In places, below a depth of 80 inches, the material is red silty clay mixed with partly decayed soft chert fragments. A few very small rounded black soft specks or accretions occur throughout the profile.

This soil has the deepest surface soil of the upland soils mapped and perhaps contains more organic matter than any associated soil. It is probable that there were large areas of Dewey silt loam in this county when the land was cleared of the original forest growth.

The clean cultivation of crops has allowed surface erosion, and in many places all or part of the original silt loam surface soil has been removed. Included with mapped areas of Dewey silt loam are spots of brown and reddish-brown silt loam which are underlain by dark-red or maroon heavy tough clay. Such spots are really Decatur silt loam and would have been mapped as such, had they occurred in larger areas.

All the Dewey silt loam has been cleared and is used for the production of cotton, corn, and hay crops. The yields, fertilizer treatment, and methods of handling this soil are similar to those for Dewey loam. Moisture conditions are good, as the soil readily absorbs much of the rainfall. This is naturally a strong soil and one which can be built up to a high state of productivity and easily maintained in this condition through proper crop rotation and the addition of green-manure crops. On the more sloping areas, terraces should be constructed and strip cropping, with grasses predominating, practiced, in order to prevent further surface erosion.

Dewey gravelly loam.—Dewey gravelly loam differs essentially from Dewey loam in the lighter color of its surface soil, its shallower subsoil, its large quantity of angular chert fragments on the surface, and its much more sloping and broken surface relief. In many places on the slopes, at a depth ranging from 30 to 40 inches below the surface, there is practically nothing but a mass of angular chert fragments, with which is mixed a small quantity of heavy red and yellow silty clay. In many places the chert fragments comprise from 20 to 40 percent of both the surface soil and subsoil.

Dewey gravelly loam occurs on the ridges, knolls, and slopes, in close association with Dewey loam, but it is much less extensive. Some of the largest areas are in the vicinity of Rogersville in the
southeastern part of the county, and numerous small areas are
developed in the bend of the river between Florence and Gravelly
Springs.

A much smaller percentage of the gravelly loam is under cultiva-
tion than of the loam. Cotton, corn, cowpeas, and soybeans are the
main crops, and yields are slightly lower than those obtained on
Dewey loam. Many areas once cultivated are now in old fields
growing up in cedar and persimmon. Japan clover and other les-
pedezas grow naturally and furnish some grazing for cattle.

The chert gravel, where they occur in large quantities, are a nui-
sance in the cultivation of certain crops, especially clean-cultivated
crops. Where the percentage of gravel is small and the surface
relief favorable, there is not a great deal of difference in the agri-
cultural value between Dewey gravelly loam and the poorer phase of
Dewey loam.

The chert fragments on the surface prevent, in some measure,
surface erosion. The elevated ridges make excellent building sites,
because they are always well drained.

The forest growth on Dewey gravelly loam is similar to that on
Dewey gravelly loam, slope phase.

**Dewey gravelly loam, slope phase.**—The slope phase of Dewey
gravelly loam occurs on the slopes and hillsides in close association
with the other Dewey soils. The slopes range from 5 to 15 percent,
with here and there some short breaks of steep or rather steep bluffs.
The land is well or excessively drained, as it is steep and borders the
drainageways or first-bottom areas of Dewey loam and Dewey
gravelly loam.

The surface soil is light-brown or brownish-yellow loam ranging
from about 6 to 10 inches in thickness. The subsoil is reddish-brown
or yellowish-brown silty clay loam or silty clay, containing a large
quantity of angular chert fragments. Chert fragments are present
on the surface and mixed with the soil, and in many places the
subsoil consists merely of a small quantity of reddish-brown silty
clay mixed with the angular chert fragments, most of which range in
diameter from about 1 to 6 inches, and some are larger. On some
slopes observed in cuts, the broken angular chert, with which is mixed
a small quantity of reddish-brown clay, extends to a depth ranging
from 15 to more than 20 feet.

Only a small part of this sloping land is under cultivation. Some
is in pasture and some, which once was cultivated, has been aban-
donned, on account of severe loss of topsoil and the consequent in-
crease in the proportion of stony material. Much of the land sup-
ports the original timber growth consisting mainly of hardwoods,
such as white, post, Spanish, and red oaks, together with some hick-
ory, poplar, ash, beech, cedar, chestnut, and walnut.

Some areas having the smoother surface relief can be used advan-
tageously for pasture, but the steepest and most broken areas, par-
ticularly the steeper bluffs, should remain in forest or be replanted
to trees. The presence of the chert gravel seems to aid in the con-
servation of moisture, and the soil does not dry out so quickly as
does Dewey loam. This is a stronger soil than the slope phase of
Dewey silt loam. Some of the land can be used for the production
of lespedeza or orchard grass for pasturage, and fair yields of corn
are obtained. Some of the smoother or less steep areas could be planted to apples or grapes.

**Baxter loam.**—The surface layer of Baxter loam is light-brown, grayish-brown, or brownish-yellow loam to a depth ranging from about 5 to 8 inches. It contains a high percentage of silt but is mellow and friable. It grades into brownish-yellow or yellowish-red silty clay loam or heavy silt loam, which continues to a depth ranging from 15 to 20 inches. This material is underlain by a red or reddish-brown somewhat compact layer of clay loam or silty clay loam, which is harder and more compact than the corresponding layer in Dewey loam. In some places the material in this layer is red or streaked reddish-brown and yellow stiff compact silty clay which shows some slight lamination or stratification. In some cultivated fields, where there has been slight surface erosion, the surface soil is brown loam to a depth of about 3 or 5 inches, and beneath this is reddish-brown silty clay loam or clay. The brown or redder color predominates in areas having the most sloping surface relief. In a few places erosion has removed the surface soil, thereby exposing the reddish-brown clay loam subsoil. In the more level and flatter areas, mottlings and streakings are pronounced in the subsoil at a depth of about 20 inches, and in such areas internal drainage has been somewhat impeded. Baxter loam may be considered an intermediate soil between Dickson silt loam and Dewey loam.

Baxter loam occurs in large areas in the west-central part of the county. Some of the largest are north of Oakland, northeast of Rhodesville, around Sullivan Crossroads, and in the vicinity of Salem Church. Some areas are in the eastern part, north of Florence, around Center Star, and north of Rogersville.

The surface relief ranges from undulating or gently sloping to gently rolling. The slopes range from about 2 to 6 percent, and all the land has good natural surface drainage. The more sloping areas, that is, those having a slope of more than 3 percent, where used for clean-cultivated crops, should be terraced or in part strip cropped.

Much of this soil is under cultivation, and it is considered one of the good agricultural soils of the county. The forest growth on the rest of the land consists dominantly of the hardwoods common to this section.

Cotton is the main crop grown, and yields range from one-third to two-thirds of a bale an acre. Applications ranging from about 200 to 500 pounds to the acre of a 4–10–4 or 3–10–3 fertilizer are commonly used for cotton, but the most profitable yields are obtained when a higher proportion of nitrogen is used. Corn yields range from about 15 to 30 bushels an acre. A number of farmers apply from 150 to 200 pounds of nitrate of soda an acre as a side dressing. Some soybeans and cowpeas are grown as green feed and for hay crops. *Lespedeza* does well on this soil. Some apples and peaches are grown. Garden vegetables are successfully produced, and small patches of sorgo are grown for the purpose of making sirup for home use. The output of sirup is satisfactory.

As a whole, Baxter loam is more leached and is lighter colored than Dewey loam, and in some places it was difficult to separate Baxter loam from Atwood silt loam and Dewey loam. Under good farm management Baxter loam can be made to produce good yields.
Agriculturally Baxter loam is handled more nearly like Dickson silt loam than Dewey loam; that is, it has a rather wide diversity of crops. The land is easy to cultivate and responds readily to the incorporation of manures, fertilizers, or the turning under of green-manure crops.

**Baxter loam, gravelly phase.**—Baxter loam, gravelly phase, is distinguished from typical Baxter loam by the presence of a small to large quantity of hard angular chert fragments and small chert gravel on the surface, a few in the subsoil, and many in the sub-stratum. The surface soil, to a depth of 6 or 8 inches, is yellowish-gray or light-brown loam. This is underlain by red heavy rather stiff clay or silty clay loam, which grades into mottled red and yellow, with some gray, clay containing chert fragments.

This gravelly soil occurs in many small areas scattered over the eastern half and the central part of the county. Most of it is developed in areas having fairly favorable surface relief, characterized by narrow ridges, low knolls, and gentle slopes, in close association with Baxter loam and Dickson gravelly silt loam. Surface drainage is good. In fact, some of the land should be terraced to prevent too rapid run-off of the rainfall and the consequent erosion.

A rather large proportion of this soil is under cultivation or is used for pasture. The forested areas support a growth of hard-woods. Lespedeza grows well and makes good pasture. Cotton is grown in areas where the content of chert fragments is low. Cotton yields range from one-third to one-half of a bale an acre, and corn from 15 to 30 bushels. Soybeans and cowpeas are grown for green feed and for hay crops. The same kinds and acre applications of fertilizer and the same methods of cultivation are practiced on this soil as on Baxter loam. Apples and peaches do well, and garden vegetables are grown for home use.

The chert fragments act as a mulch, help hold the moisture, and protect the soil from erosion. The more gravelly and stony areas and those bodies which have the steepest surface relief should remain in forest or be reforested.

**Abernethy silt loam, light-colored phase.**—Abernethy silt loam, light-colored phase, occurs in numerous small areas throughout the red-land soils. Some of the largest bodies are in the bend of Tennessee River, around Oak Grove Church, and northeast, northwest, and south of Oakland. This soil occupies the swales, basins, and pondlike depressions surrounded by the Dewey and Baxter soils. Prior to the clearing of the original forest growth and before cultivating the red lands, the original surface soil was evidently light gray and resembled Guthrie silt loam which is described in subsequent pages of this report.

Through surface wash of the fine materials from the surrounding higher lying red soils and the deposition of these materials through surface erosion and colluvial wash, a light-brown or dark-brown silt loam has accumulated to a depth ranging from 8 to 24 inches. The surface soil material having the lighter color has been washed mainly from the Baxter soils, whereas the brown or red surface soil material has been washed in from the slopes of the Dewey soils. The underlying material is yellowish-gray, mottled with brown,
Heavy silt loam or silty clay loam. In places, light-gray slightly plastic silty clay is reached below a depth of 30 inches.

In ordinarily dry seasons the soil is well drained, but during excessively wet springs corn may drown out or the planting of this crop may be delayed. It has been suggested that dynamiting the substratum to allow the surface water to run through might improve drainage in such areas.

This soil is held in high esteem by the farmers, and practically all of it is under cultivation. It contains a high percentage of plant nutrients and also a rather large quantity of organic matter. It is the best upland soil in the county for the production of corn, yields of which range from 20 to 60 bushels an acre. The use of commercial fertilizers has not proved profitable. In the production of corn this soil ranks next to Huntington silt loam of the first bottoms. On some of the larger areas where drainage is best established, cotton is grown to a small extent, but the stalks grow too rank and many of the bolls do not open. Some soybeans and cowpeas are grown successfully for green feed and as hay crops. Small areas of the lighter colored soil are used for the production of sorgo.

Elk silt loam.—The 4- to 6-inch surface soil of Elk silt loam is light-brown or grayish-brown silt loam which is mellow, friable, and easy to cultivate. The subsoil is light-brown or yellowish-brown friable heavy silt loam or silty clay loam, which continues to a depth ranging from 30 to 40 or more inches, where it passes into mottled brown and yellow silty clay loam. Near the mouth of Colbert Creek, there is a yellow, mottled with brown or gray, compact layer of silty clay loam in the subsoil. In a few places, the surface soil is reddish brown, and the subsoil is red silty clay loam similar in its characteristics to Cumberland silt loam. In places where Elk silt loam borders areas of Lindside silt loam, the surface soil is lighter in color, and the subsoil is more or less mottled yellow, brown, and gray. A few small rounded chert gravel are present on the surface in some places, but where the gravel are abundant and the areas sufficiently large, the soil is classed as Elk gravelly loam.

Elk silt loam occurs mainly in the second bottoms and terraces along Tennessee River and to less extent along some of the larger creeks, particularly Burcham, Cypress, and Lindsay Creeks. All the land lies above normal overflow. The surface relief ranges from almost level to gently undulating. This land is well drained and warms up quickly in the spring.

Most of this soil is under cultivation. The main utilization for it is for the production of cotton, and the yields range from one-fourth to three-fourths of a bale an acre. Corn produces from 10 to 35 bushels. Most of the cotton and corn are fertilized, and some farmers side dress both cotton and corn with nitrate of soda. This is considered a good agricultural soil and one capable of being improved.

Elk gravelly loam.—Elk gravelly loam is readily recognized by the presence of a large quantity, in most places from 25 to 50 percent of the surface soil and subsoil mass, of angular chert gravel ranging from 1 inch to 4 inches in diameter, together with some rounded quartz gravel. The surface soil is slightly lighter in color than the surface soil of Elk silt loam. The subsoil is friable and permeable light-brown loam or clay loam. In many places Elk
gravelly loam consists of a conglomeration of silt, fine sand, chert fragments, and rounded gravel. There is more sand in Elk gravelly loam than in Elk silt loam. This is particularly the case near the intersection of some of the lateral streams which have brought down the sand and deposited it against the river bottoms.

Elk gravelly loam occurs in small areas on the second bottoms and terraces along Tennessee River and the creeks flowing into the river. Some of the largest areas are along Bluff, Bitter, Brush, and Manbone Creeks. The soil lies above normal overflow, but it is overflowed during times of extremely high water. The large quantity of gravel and in some places a gravel substratum seem to improve the drainage, causing the soil to warm up early in the spring.

A large percentage of the land is under cultivation and is used almost exclusively for the production of cotton. Cotton fruits exceptionally early and well on this soil. Owing to the good internal drainage and aeration, yields of cotton range from one-third to two-thirds of a bale an acre on land which has been liberally fertilized. A small acreage is devoted to corn. Garden vegetables and sweet-potatoes do well.

Cumberland silt loam.—The surface soil of Cumberland silt loam consists of a 6- to 8-inch layer of brown or reddish-brown mellow and friable silt loam. The subsoil is brownish-red or red heavy silt loam or silty clay loam, which is dominantly friable but in some places is rather stiff and brittle.

This soil occurs on the second bottoms and terraces of Tennessee River and the larger creeks. It lies above normal overflow, is naturally well drained, and has a smooth surface relief which is favorable for agricultural purposes. When the Wheeler Dam is completed and the lake filled with water, practically all the Cumberland soil lying east of the dam along Tennessee River will be covered with water.

Cumberland silt loam is naturally a good farming soil which is well suited to the production of cotton, corn, and hay crops. Cotton is the principal crop, and yields range from one-third to 1 bale an acre, depending on the kind and quantity of fertilizer applied.

Huntington silt loam.—The surface soil of Huntington silt loam is brown silt loam to a depth ranging from 15 to 24 inches. It dries out to a light-brown color, is mellow, smooth, and easy to till. This material is underlain by lighter brown silt loam which extends to a depth of several feet. Both rust-brown and gray mottlings are present at depths ranging from 12 to 24 inches below the surface. In places in the lower situations rust-brown mottlings are noticeable at a depth ranging from 3 to 4 feet. In some of the higher lying areas the soil, to a depth between 8 and 12 inches, ranges from light-brown to dark-brown silt loam which grades to slightly lighter brown silt loam extending downward to a depth of 18 or 20 inches. Below this depth the material becomes slightly heavier in texture—silty clay loam which continues downward to a depth of several feet. The position of such areas is similar to that of the Elk silt loam areas.

Huntington silt loam is the most extensive soil developed in the first bottoms, and most of it occurs along Tennessee River. Smaller strips lie along some of the larger tributary creeks, where the soil
is not so brown and is not so productive as that along Tennessee River.

The surface relief of Huntington silt loam ranges from level to slightly undulating. The land is comparatively well drained; both surface and internal drainage are good. This soil is subject to overflow, but crops are seldom destroyed by overflow water.

This is the premier corn soil of Lauderdale County, and most of it is under cultivation. Yields of corn range from 30 to 100 bushels an acre without any fertilization. Mammoth Yellow soybeans do well, as they can stand overflow of water for 2 or 3 days at a time without serious injury. Johnson grass does well, and the yields of hay are large. Sorgo produces a heavy yield, but the quality of the sirup is not quite so good as that obtained from sorgo grown on the lighter colored soils.

**Huntington silt loam, heavy-subsoil phase.**—Huntington silt loam, heavy-subsoil phase, differs from Huntington silt loam mainly in that it occupies slightly higher positions in the first bottoms and has a much heavier subsoil than typical Huntington silt loam. The surface relief of the heavy-subsoil phase ranges from undulating to very gently sloping. At times of extremely high water, the land is overflowed, but the water does not become deep enough seriously to damage the crops. In receding, however, the water washes off the surface soil to considerable extent, and in places the heavy silty clay subsoil is exposed.

The surface soil of Huntington silt loam, heavy-subsoil phase, is mellow and friable brown silt loam from 4 to 6 inches thick. The subsoil, which begins abruptly, is very dark brown heavy, tough, and somewhat compact silty clay. It breaks into irregular-shaped lumps and cracks on drying. It extends to a depth ranging from 4 to 6 feet, where it grades into brown or dark-brown silty clay which is rather heavy but not so tough as that in the layer above.

Only small areas of this soil are mapped. It occurs in close association with Huntington silt loam. Practically all the land is cleared and used for the production of crops or for pasture. Yields of corn are lower than those obtained on Huntington silt loam. This is probably due to the fact that this soil does not have such good moisture-holding capacity as Huntington silt loam. A few small areas are used for the production of cotton. This land is not easy to cultivate. The clods break into large lumps, and unless the soil is plowed and harrowed under favorable moisture conditions, the lumps will remain during the cropping season. This is naturally a strong productive soil but not so desirable for general farming purposes as Huntington silt loam.

**Huntington silt loam, gravelly phase.**—Huntington silt loam, gravelly phase, is developed as narrow strips in the first-bottom areas along the streams which flow out of the hill section in the western part of the county. Most of this soil lies only a few feet above the water level of the streams and is subject to overflow during times of high water.

Huntington silt loam, gravelly phase, consists of a mixture of silt, some fine sand, rounded quartz, rounded chert gravel, and angular chert gravel. The gravel content ranges from 25 to 60 percent of the soil mass. The surface soil is light brown or brown, and the
underlying material is light brown. In places the gravel content increases with depth, and, at a depth ranging from 2 to 3 feet, there is a bed of gravel with only a small quantity of fine material.

Probably less than one-half of the area of this soil is farmed, and the cultivated areas are those in which the gravel content is the least. Corn is the principal crop, and yields range from 15 to 30 bushels an acre. Much of the land is used for pasture. Some spots are too gravelly for any other use except pasture and forest.

**GRAY-SOIL GROUP**

The gray-soil group includes all the soils of the Dickson, Savannah, Atwood, and Cuthbert series. These soils occur in a belt across the northern part of the county, which is broken by areas of Baxter stony loam or Guin soils, undifferentiated. The largest, most continuous, and best developed areas are in the northern part, particularly around Green Hill, Jacksonburg, and Threet.

The surface relief of the soils of this group ranges from almost level to undulating and gently rolling. The relief is sufficient to provide good surface drainage, but in many of the soils internal drainage is impeded by the presence of a compact layer in the lower part of the subsoil.

The surface soils of these soils are whitish gray or gray and are prevailingly silty in texture. The subsoils range from yellow to brownish yellow, in the Dickson and Savannah soils, to reddish brown in the Atwood soils. The soils of this group are characterized by a hardpan, or compact, layer which occurs at a depth ranging from 2 to 4 feet beneath the surface. The hardpan layer is well developed in the Dickson and Savannah soils and to less extent in the Atwood soils.

All these soils are very low in content of organic matter, and there is very little in the surface soils. They are extremely leached of the soluble plant nutrients and in their natural state are of low productivity. They respond readily to the application of commercial fertilizers, manures, and the turning under of cover crops. The hardpan layer impedes the passage of water and soil moisture during times of drought.

The gray soils occur in that part of the county formerly known as the "Barrens," a term applied to this section because of the light color of the soils and the somewhat scrubby growth of timber. These features indicated to the early settlers a poor soil as compared to the red soils of the valley, on which were located large plantations. The gray soils were the last to be brought under cultivation. Around Anderson, Lexington, and in a few other places, some areas of these soils have been settled and farmed for a long time, but the greatest development and settlement have been within the last 30 years. Part of the land is in woods, and a small acreage is being cleared for farming. Especially is this true of Dickson silt loam.

Farming operations on these soils, more especially on Dickson silt loam, are diversified in character, and a more self-sustaining agriculture is developed than on the red lands. This is owing mainly to the fact that the gray lands are held for the most part in small tracts ranging in size from 40 to 300 acres, many of them being around 60 or 80 acres, and these are operated mainly by the owners or under
careful supervision of the owners. During the course of the soil survey, better houses, barns, and farm machinery were observed on the gray soils than on the red lands. Most of the labor is done by the owner and members of his family. Very few colored people live in this locality. Better schools and social conditions prevail here than in the valley.

Cotton and corn are the principal crops grown on the gray soils. These are supplemented by hay, some fruit, garden vegetables, sweet-potatoes, and sorgo. The quality of the sirup produced from sorgo grown on these light-colored soils is superior to that from sorgo produced on the dark-colored soils.

Dickson silt loam.—Dickson silt loam has the largest area and agriculturally is the most important soil in the gray-soil group. The 5- to 8-inch surface layer of this soil, locally known as “gray land”, is yellowish-gray or light-gray mellow and friable silt loam. It grades into yellow or slightly brownish yellow heavy silt loam, and this continues downward to a depth ranging from about 12 to 15 inches. This material grades into heavy silt loam or silty clay loam of a yellow or brownish-yellow color and continues downward to a depth ranging from 28 to 36 inches. Under normal moisture conditions this material is friable, crumbly, and readily breaks down to a mealy mass. Below this is a dry, hard, compact layer of mottled light-gray and yellow or brown silty clay loam or clay loam locally known as “hardpan.” In some places the hardpan contains light-red mottlings. This layer ranges in thickness from about 12 to 24 inches and grades into mottled light-gray and yellow or brown, with some light-red, silty clay material containing both soft and hard angular chert fragments. This description applies to the large areas of uniform soil in the vicinity of Anderson, south of that town, and east of Green Hill. The hardpan layer in most places is hard, particularly in the flatter areas, whereas in the more sloping areas it is not so hard but simply forms a compact layer. To the west and southwest of Pruittton the hardpan layer is generally a little nearer the surface than in the areas around Green Hill and north of Rogersville.

In some places on the crests of the ridges and on the more sloping areas, surface erosion has removed part or all of the silt loam surface soil, and in such localities the hardpan layer is within 16 or 18 inches of the surface. In the more sloping areas the hardpan is only feebly developed, and the material immediately under the subsoil is redder than it is in the more level areas. Bordering areas of Guthrie silt loam, the hardpan is generally nearer the surface than in the more representative areas.

Dickson silt loam occurs in large unbroken areas throughout the northeastern and north-central parts of the county. It is well developed north of Rogersville, around Hurricane Church, Grassy Church, Lexington, and Green Hill, south of Mount Tabor Church, east of Cloverdale, and in the vicinity of Threet. Many small areas occur throughout the county, beginning east of Gravelly Springs and extending to Limestone County on the east.

The surface relief of this soil is dominantly undulating or gently rolling and gently sloping, with some almost level areas and areas having a very gradual slope. Practically all the land lies favorably for agricultural purposes. Surface drainage is good for the most
part, and very little ditching is necessary. In the flatter areas the hardpan layer does not allow free penetration of rain water. On some of the more sloping areas terracing is necessary in order to hold the surface soil and prevent surface erosion.

A large proportion of this soil has been cleared and is under cultivation. There are, however, rather extensive areas which have not been cleared. The forested areas support a growth of hardwoods consisting of white, post, Spanish, and red oaks, together with some blackjack oak, hickory, poplar, sourwood, cedar, and black gum.

This is one of the good general farming soils. On it is practiced the most diversified type of farming in the county. The farm buildings and improvements, as a rule, are of better quality than those on the soils in the valley section.

Cotton is the cash crop. Yields range from one-third to three-fourths of a bale an acre. Applications ranging from 200 to 400 pounds an acre, in some instances 500 pounds, of commercial fertilizer analyzing 4–10–4, 4–8–4, or 3–10–3 are used, and a side dressing of 25 pounds of nitrate of soda or its equivalent to each 100 pounds of the base application. It has been demonstrated that a higher grade of commercial fertilizer applied at a rate ranging from 400 to 600 pounds an acre can be used profitably. Corn is an important crop, and a large acreage of this soil is devoted to its production. Some corn is grown on practically every farm, and yields range from 15 to 30 bushels an acre. It is used mainly as feed for the work animals and hogs and for the production of meal for home use. It is reported that a few farmers sell a small quantity of corn. Very few of the farmers fertilize their cornland, but, where it is fertilized, from 100 to 150 pounds an acre of nitrate of soda or its equivalent is used. Yields of corn are considerably increased if a green-manure crop has been previously turned under. A considerable quantity of the Whippoorwill variety of cowpeas and Mammoth Yellow, Ootooan, and Laredo soybeans are grown. Most farmers broadcast the seed or drill it in rows about 18 inches apart, and some farmers plant the seed between rows of corn at the last cultivation. These are the main hay crops grown on this soil, and the yields range from one-half to 1 ton an acre. Early Amber sorgo, mixed with cowpeas and soybeans, is also grown for hay.

Texas Seeder sorgo does well on this soil. Yields of sirup produced from an acre of this cane range from 50 to 125 gallons. The sirup is of good quality, having a bright color and an excellent flavor. Sirup could be produced profitably on a commercial scale if community organizations would see that a uniform product was manufactured and graded and a market obtained for it. In addition to the staple farm crops, apples and peaches are grown for home use and a few for sale. A wide variety of garden vegetables can be successfully grown. A fair quantity of sweetpotatoes is produced, and yields are good where the land is fertilized or manured. In Dickson County, Tenn., the same type of soil is used for the production of tobacco, and there seems to be no reason why tobacco could not be grown in Lauderdale County.

Dickson silt loam is naturally low in organic matter. The land is mellow and easy to till. It responds readily to the application of lime, manures, and commercial fertilizers and to the turning under
of green-manure crops. It can be built up to a fair state of pro-
ductivity and fairly easily maintained in this condition by proper
crop rotation, by turning under leguminous crops, and by the addi-
tion of barnyard manure.

**Dickson gravely silt loam.**—Dickson gravely silt loam is similar
in many respects to Dickson silt loam, except that it contains vary-
ing quantities of small angular chert gravel, particularly in the areas
having smoother surface relief. In the more sloping areas, the
hardpan layer, so characteristic of Dickson silt loam, is only feebly
developed, and in many places there is no real hardpan, only a
slightly compact layer, and a large quantity of chert gravel is
present in the subsoil. In a few places the chert gravel occur in
such abundance as to interfere with the cultivation of hoed crops.
The subsoil of Dickson gravely silt loam is in many places yellowish-
red silty clay loam, in contrast to the yellow subsoil of Dickson
silt loam. This red color is owing to better drainage and aeration,
as most of the gravely silt loam is more sloping than the silt loam.

Dickson gravely silt loam occurs in close association with Dickson
silt loam and in some places is closely associated with Baxter loam,
gravelly phase. The largest areas are developed in the north-
eastern part of the county, and many smaller areas occur through-
out the north-central part. This soil occupies the narrow ridges,
knolls, and upper parts of the slopes. Most of it has a surface
relief favorable for agricultural purposes, and it is all naturally
well drained.

The same kind of fertilizer is used, the same methods of culti-
vation are practiced, and practically the same crops are grown as
on Dickson silt loam, but yields are slightly lower. Lespedeza does
well on this soil.

**Dickson gravely silt loam, slope phase.**—The slope phase of
Dickson gravely silt loam differs from typical Dickson silt loam,
in that it contains a large quantity of chert gravel and fragments
and occupies slopes ranging from 8 to 25 percent. The subsoil is
not uniformly colored, as it ranges from red to yellow, and the
surface soil is dominantly shallow. Soil of this phase includes
small areas of Baxter stony loam, as it is impossible on the small-
scale map to separate these two soils accurately in places where
they adjoin on the steep slopes.

The most conspicuous feature of Dickson gravelly silt loam, slope
phase, is the presence of large quantities of angular chert fragments
ranging from 1 to 6 or more inches in diameter. These occur on
the surface, to some extent in the subsoil, and in large quantities
below the subsoil. In places they occur in such abundance as to
interfere with cultivation.

This soil has a general distribution over the northeastern and
north-central parts of the county. It occurs on slopes in close asso-
ciation with Baxter stony loam and Dickson gravelly silt loam. In
general, it occupies slopes, steep hillsides, narrow ridges, and knolls,
and some of it is developed on the long fairly steep slopes. All
the land is naturally well drained.

Some areas of this soil have never been cleared, and the land is
forested with the hardwoods common to the section. Some of the
once-farmed areas have been abandoned, but part of the steep slopes
are now farmed. In a few places areas of this soil which were once allowed to lie idle are now being farmed for the second time. Erosion is not so active or so serious on this soil as on some of the more level areas free from gravel and stone. The gravel and stone fragments protect the soil from considerable erosion. This soil should be handled with great care, that is, the slopes should be protected from surface erosion by terracing or strip farming with grass and green-manure crops. Lespedeza does well on this soil. Corn, cotton, and hay crops are grown. Yields of all crops average somewhat lower than those obtained on Dickson silt loam or Dickson gravelly silt loam. Some of this land can be used advantageously for the production of fruits and for pasture. The steeper and more stony areas should remain in forest or, if cleared, should be reforested or converted into pasture.

**Savannah silt loam.**—The 5- to 7-inch surface soil of Savannah silt loam in cultivated fields is yellowish-gray or light-gray silt loam containing a noticeable quantity of very fine sand. It is mellow, friable, and, as the light color indicates, is low in organic matter. The subsoil consists of deep-yellow heavy silt loam which grades, within a few inches, into silty clay loam continuing downward to a depth ranging from about 28 to 32 inches. This layer is friable and crumbly under ordinary moisture conditions and breaks up into a friable mass. Below this is a hard, compact, dry layer of mottled yellow and light-gray silty clay loam which ranges in thickness from 4 to 10 inches and is underlain by red-tinged or light-red and yellow hard but brittle clayey or very fine sandy clay material. In forested areas the topsoil, to a depth of 1 or 2 inches, is dark-gray silt loam, owing to the presence of a small quantity of organic matter.

Included with mapped areas of this soil are small bodies of Atwood silt loam and Cuthbert very fine sandy loam, which account for the redder color in the subsoil in some places. Savannah silt loam resembles Dickson silt loam in color, texture, structure, and more particularly in the presence of the hardpan layer.

Savannah silt loam is developed in the northwestern corner of the county. The largest areas are in the vicinity of Youngs Store, south of that place, north of Elting School, and along the Tennessee State line. This soil occupies some of the highest positions in the county. The surface relief ranges from undulating or gently rolling to gently sloping on the greater part of the broad ridge crests. All the land has good surface drainage, but internal drainage on some of the flatter areas is somewhat impeded by the presence of the compact, or hardpan, layer in the subsoil.

This soil erodes greatly on some of the slopes, where, in places, a part or all of the surface soil has been removed through surface erosion, and in a few places gullies are beginning to form. Very little effort is being made to prevent erosion which, in a large measure, could be checked by terracing and strip farming, mainly to grasses.

A large part of this land is under cultivation. The forest growth on the rest includes rosemary (shortleaf) pine, old-field pine, post oak, Spanish oak, and white oak, together with some hickory, dogwood, and sourwood.
This is a good soil for the production of cotton, and where ferti-
лизed with an acre application ranging from 300 to 400 pounds of a
4–10–4 or 3–10–3 mixture and a side dressing of 100 or 150 pounds of
nitrate of soda or its equivalent, yields range from one-third to two-
thirds of a bale an acre. Some corn is grown, but the yields are
usually low unless the land has been manured or fertilized. Some
farmers apply from 100 to 150 pounds of nitrate of soda an acre to
the cornland as a top dressing. Sorgo does well in the more moist
situations, especially when the land is fertilized. The quality of the
sirup produced from the cane on this soil is especially fine flavored.
Garden vegetables, sweetpotatoes, and orchard fruits do well. A few
cowpeas and soybeans are grown, mainly as hay crops. The same
methods of improvement as those suggested for Dickson silt loam
are applicable to this soil.

**Atwood silt loam.**—The surface soil of Atwood silt loam in culti-
vated fields is grayish-yellow or light-brown silt loam to a depth of
about 5 or 7 inches. It is underlain by brownish-yellow or yellowish-
red heavy silt loam a few inches thick. This material grades into
silty clay loam or clay, which is firm but friable and readily crumbles
into a mealy mass. In places, at a depth ranging from 28 to 32
inches, there is a rather compact layer of yellowish-red silty clay,
especially in the areas having the flatter and smoother surface relief.
In areas of sloping relief the compact layer is only feebly developed.
At a depth of about 40 inches, there is a layer of streaked or
splotched light-red, yellow, and gray friable silty clay loam mate-
rial. The compact layer, so characteristic of Savannah silt loam, is
not so well developed throughout the Atwood soil and in most places
lies at slightly greater depths below the surface.

Atwood silt loam occurs in the northwestern part of the county
in the high, broad interstream areas. Some of the largest bodies are
west of Melvin, northwest of Threet, east of Pine Hill Cemetery, and
in the vicinity of Youngs Store. A few areas border the Wayne
County, Tenn., line.

This soil occupies ridge crests, knolls, and general slopes. All the
land has good natural surface and internal drainage. The more slop-
ing areas are subject to erosion and should be terraced or strip
farmed, mainly to grass crops.

Only a small percentage of this soil is under cultivation, and the
greater part is forested to hardwoods and pines. The crops grown,
tillage methods, and fertilizer treatment on this soil are similar to
those practiced on Savannah silt loam. In some places, however,
crop yields are slightly higher than those obtained on the Savannah
soil.

Atwood silt loam is an early soil, easy to handle, and responds
readily to fertilization. It is low in humus and is in need of pro-
tection from leaching and erosion.

The areas of this soil lying along the Tennessee boundary in the
western part of the county adjoin areas of Savannah silt loam, high
phase, in Hardin County, Tenn. The Savannah soils are identical
with the Atwood soils in all respects except the color of the subsoil,
which in the Savannah soils is yellowish brown and in the Atwood
soils is reddish brown. In the western part of Lauderdale County
the Atwood soils are less red than typical but are identified as At-
wood soils, whereas in Hardin County they were considered yellow enough to be identified as Savannah soils.

Atwood silt loam, gravelly phase.—Atwood silt loam, gravelly phase, is similar in color, texture, and structure to typical Atwood silt loam. It differs from Atwood silt loam in the presence of small rounded chert gravel and some rounded quartz gravel, distributed throughout the profile. The content of gravel varies from place to place, but in general it comprises from 15 to 50 percent of the soil mass. A few fragments of angular and platy iron fragments and some conglomerate occur here and there.

This gravelly soil occurs in the northwestern part of the county, in close association with Atwood silt loam and the Guin soils. The largest areas lie northwest of Gravelly Springs between Bitter Creek and Bluff Creek. Smaller bodies are on Rainbow Ridge and northwest of Graham School. This soil occupies slopes, narrow ridges, and low knolls, and it is everywhere well drained. Surface erosion and some gullying have taken place, but much of this could be corrected by terracing or strip cropping.

Very little of the land is cleared and under cultivation, as the greater part of it is forested to a mixture of hardwoods and pines. Most of the original forest has been cut, and the second growth persists. The cultivated areas are used for the same crops as is Savannah silt loam. The more gravelly and sloping areas should remain in forest.

Cuthbert very fine sandy loam.—In cultivated fields the surface soil of Cuthbert very fine sandy loam is yellowish-gray or light-brown very fine sandy loam to a depth of about 6 inches. It grades into yellow or brownish-yellow very fine sandy loam which at a depth of about 10 or 12 inches passes into reddish-brown or yellowish-red firm but friable very fine sandy clay continuing downward to a depth of 18 or 20 inches. Below this is a yellowish-red or yellowish-brown heavy or compact very fine sandy clay or clay, and this material, in turn, grades at a depth of about 30 inches into mottled or splotched light-red and yellow clay loam or heavy very fine sandy clay. In a few places the surface soil is yellowish-gray very fine sandy loam about 12 inches thick, and in other places, especially where erosion has removed most of the surface soil, brown fine sandy clay is exposed. Cuthbert very fine sandy loam grades into Atwood silt loam, and in many places a sharp line of demarcation is difficult to establish.

Cuthbert very fine sandy loam occurs only in a few small areas in the extreme northwestern part of the county. Some of the largest bodies lie along the Lauderdale and Hardin Counties line. The land is undulating or gently sloping, as most of this soil is developed on the smooth ridge crests. Surface drainage is excellent. Surface erosion has been active in some cultivated fields, and terracing is necessary.

Only a small proportion of the land is under cultivation, and the rest is forested to rosemary and old-field pines, together with some hardwoods. The crops grown, fertilizer treatment, and methods of cultivation are similar to those practiced on Savannah silt loam. The same methods of improvement are recommended as for Dickson silt loam.
MISCELLANEOUS SOILS AND LAND TYPES

In this group are classed soils which vary widely in soil characteristics, surface relief, drainage conditions, and agricultural value. The group includes Guin very fine sandy loam, Guin very fine sandy loam, gravelly phase, Guin soils, undifferentiated, Baxter stony loam, Guthrie silt loam, Lindside silt loam, Melvin silt loam, and Melvin silt loam, mixed phase. The group, as a whole, includes those soils whose characteristics do not fit into either the red-soils group or the gray-soils group. The Guin soils occur in large areas in the northwestern and extreme western parts of the county. They occupy that area of rough broken land which for the most part is unsuited for agricultural purposes. Small proportions of Guthrie silt loam, Lindside silt loam, and Melvin silt loam are under cultivation. These soils represent areas that are poorly drained or are subject to overflow. Baxter stony loam, by reason of its steep surface relief, is best suited to forestry.

Baxter stony loam.—The 3- to 10-inch surface soil of Baxter stony loam is light-gray or yellowish-gray silt loam or loam, and the subsoil is dominantly light-red silty clay which is rather stiff, heavy, and contains an abundance of chert fragments. In some places the subsoil is yellow or reddish-yellow silty clay. Scattered over the surface and mixed throughout the surface soil and subsoil is a large quantity of angular chert fragments ranging from 1 to 6 inches in diameter, together with some fine chert particles and, here and there, many larger chert rocks.

In many places the subsoil or the underlying material consists of a mixture of angular chert fragments and light-red or yellowish-brown silty clay, and in such places the angular chert fragments predominate. In some places the surface soil is light brown or brown, particularly where surface erosion has removed the once light-colored surface soil. On some slopes, where the soil has been poorly managed through continuous cultivation, surface erosion has removed practically all of the original surface soil during the last 15 or 20 years. Ledges of limestone are numerous on the lower slopes bordering the first bottoms or adjacent to the streams. In some places these consist of perpendicular walls of limestone rising to a height ranging from 50 to 100 feet.

This soil occupies large areas in the north-central and eastern parts of the county. The largest continuous bodies lie along Shoal Creek, the headwaters of Bluewater Creek, and along Little Butler Creek, and smaller bodies and narrower strips are along Little Cypress Creek and northeast of Florence along Tennessee River.

This soil occurs dominantly on the hillsides and steep slopes, and it has the roughest and most erosive surface relief of any soil in the county, except the soils classed as Guin soils, undifferentiated. It ranges in slope from about 10 to 60 percent, most of it having a 15- to 30-percent slope. Narrow ridges and rounded hilltops are conspicuous throughout the areas. In places where the land has been cultivated and not protected by a grass cover, erosion is pronounced, and in many places gullies have formed, but not so badly as would be expected in a soil having such steep surface relief.

Probably not more than 15 or 20 percent of Baxter stony loam has been cleared and is either in cultivated crops or pasture grasses. In
some localities a large part of the cleared land has reverted to old fields and is now growing up in hardwood forest. Corn is the main crop, and yields range from 15 to 30 bushels an acre. A few areas are devoted to the production of cotton. Garden vegetables are successfully grown, and apples do well. Lespedeza does especially well on this soil and makes good pasture. It is an excellent crop for protecting the soil from surface erosion.

Some areas having a slope ranging from 15 to 25 percent have been cleared and cultivated. The steeper part of such areas should be in grass or forest. The greater part of Baxter stony loam, because of its steep surface relief, the presence of a large quantity of chert fragments, and its susceptibility to erosion on the steeper slopes, if cleared, should remain in forest or be reforested.

**Guthrie silt loam.**—The surface soil of Guthrie silt loam is light-gray or grayish-white silt loam ranging from 10 to 15 inches in thickness. Below a depth of 3 or 4 inches this material is faintly mottled with yellowish brown or brown. It is underlain by steel-gray, with some yellowish-brown or rust-brown mottles, heavy and somewhat plastic clay or silty clay, which may continue downward to a depth ranging from 4 to 5 feet, and in places it grades into a rather compact, tough, dry silty clay of mottled gray and rust-brown color, at a depth ranging from 30 to 36 inches. A few soft small iron accretions are present in a few places in the compact layer.

In some areas the subsoil is dark-gray, mottled with yellow and rust brown, heavy silt loam or silty clay loam. In places where this soil is surrounded by the red soils, such as the Dewey and Baxter, there has in some places been an accumulation or overwash of red silt loam, and the surface soil is brown silt loam to a depth ranging from 3 to 6 inches.

Guthrie silt loam occurs both in small and rather large areas scattered over all parts of the county except the western. The largest bodies are developed in the Bell Sink and Ann Pond northeast of Smithsonia, in the vicinity of Melvin, and in the northeastern part in the vicinity of Lexington and Anderson. There are some small, irregular-shaped areas, many of which are narrow and winding and some more or less circular.

This soil occupies slightly lower to considerably lower positions than the surrounding soils. It occurs in the circular depressions, mainly within areas of the Dickson and Dewey soils. The surface relief is prevalingly flat and level. No natural drainage has been established, and water stands on the surface for a long time during wet seasons. Much of the surface soil and subsoil is saturated during a large part of the year. Much of the land could be drained by digging deep ditches or canals across the surrounding higher land to some of the natural drainageways and supplementing these canals with small open ditches. With such improvement carpet grass and Bermuda grass would thrive, particularly where an overwash of dark-colored soil forms the surface soil.

Probably not more than 10 percent of this land has been cleared, and the rest is forested to cedars, black gum, sweetgum, maple, sourwood, Spanish oak, and other hardwoods. The cleared part is used mainly for summer pasturage of cattle, and this is the best use for the better drained areas. Corn is grown in small patches, principally on
the slightly higher bodies bordering other soils. If the land were better drained, it is probable that carpet grass or Bermuda grass would be a good pasture grass for this soil. Where not drained, the best use for it is forestry.

Lindside silt loam.—The surface soil of Lindside silt loam is light-brown or grayish-brown silt loam to a depth of about 6 inches. Underlying this and extending to a depth of about 24 inches is yellowish-gray silty clay loam or silty clay, mottled with rust brown and containing an abundance of small soft iron concretions about the size of buckshot. Below this and extending to a depth ranging from 30 to 40 inches is light grayish-brown compact and dry but brittle silty clay mottled with rust brown and some soft iron concretions. This material is underlain by gray silty clay containing a large quantity of soft iron concretions or mottled iron stains. At a depth of about 4 feet, this material, in turn, grades into light-gray silty clay. In a few places the 6-inch surface layer is brown silt loam, approaching in color and characteristics Elk silt loam. The subsoil in some places is grayish-yellow silty clay loam containing some rust-brown mottlings. In some of the flatter positions and in the more poorly drained locations the surface soil is gray and the subsoil is gray or grayish-yellow silt loam or silty clay loam, resembling Melvin silt loam. In a few spots, the surface soil is gray silt loam and the subsoil is brownish-yellow heavy silt loam or silty clay loam.

Lindside silt loam occurs in the second bottoms and terraces of Tennessee River and along a few of the larger creeks. It lies intermediate in position between Elk silt loam and Huntington silt loam and is above normal overflow.

The surface relief ranges from level to undulating and gently sloping. Drainage for the greater part of the land is poor, especially internal drainage, as water passes through the subsoil very slowly.

A large part of this land is used for pasture, and its best use is for this purpose. It produces fair carpet grass, particularly in the better drained areas. The cultivated part, particularly those areas which have the deepest and darkest colored surface soil, is used mainly for the production of corn. A small acreage is planted to cotton. Some sorgo is grown for sirup; and hay, chiefly cowpeas and sorgo, is produced for feed. Yields of all crops are less than those obtained on Elk silt loam. The Lindside soil is somewhat difficult to handle when wet, and when dry it tends to crack and become droughty.

Melvin silt loam.—The surface soil of Melvin silt loam is light-gray, gray, or almost white silt loam ranging in thickness from 6 to 10 inches. In places it shows some mottlings of brown. It has a floury feel and is mellow and friable. This material is underlain by light-gray or almost white, mottled with brown, sticky clay or silty clay loam. In some places, below a depth of 30 inches, there is a dry hard compact silty clay layer of mottled light-gray, yellow, and brown colors. A few small iron accretions are present in the profile in places. In a few places the surface soil is mottled light-gray and rust-brown heavy silt loam, and in a few places it is light-brown silt loam resembling Huntington silt loam, and the subsoil is mottled yellow and brown.
Melvin silt loam occupies long strips along Sinking and Cypress Creeks. The largest area lies along Sinking Creek about 2½ miles northeast of Smithsonia. Smaller bodies occur in the sloughs in the Tennessee River bottom. This soil lies only a few feet above the normal water level of the streams and is subject to frequent overflow. In some of the flatter and slightly depressed areas water stands on the surface a part of the time, and the greater part of the land is saturated during the entire year.

Very little of this soil is used for the production of crops. The greater part supports a forest growth of water oak, swamp maple, elm, sweetgum, hickory, willow, alder, hackberry, and sycamore. Rather large areas are used for pasture, and in some of these the greater part of the forest growth has been cut, leaving only scattered trees throughout the pasture. Some sorgo is grown, and a small quantity of hay is produced. If better drained, limed, and seeded, this soil would be better adapted to pasture grasses, to the production of sorgo, and to the growing of hay crops.

**Melvin silt loam, mixed phase.**—Melvin silt loam, mixed phase, differs essentially from typical Melvin silt loam, in that it has no uniformity in the surface soil or subsoil, including as it does spots of Huntington silt loam, Melvin silt loam, a mixture of the two, and many small gravelly areas. In some of the larger bodies the surface soil is light brown or light gray, and it dries out to a very light colored silt loam ranging from 6 to 12 inches in thickness. This material is underlain by light-gray or grayish-yellow soft unctuous silt loam more or less mottled in places with brown. In some places, the surface soil is light-brown silt loam, containing an abundance of small angular chert gravel, and this material is underlain, at a depth ranging from 8 to 15 inches, by grayish-brown or yellowish-brown soft silt loam. In other places, near the base of the uplands, the small streams have deposited a large quantity of angular chert fragments on the surface, and in places these have become mixed with the surface soil and subsoil. A few areas have a brown silt loam surface soil extending to a depth ranging from 2 to 3 feet.

As a whole, this mixed soil is better drained than typical Melvin silt loam, although practically all of it is subject to frequent overflow. It occurs in long continuous strips along Burcham, Lindsay, and Cypress Creeks. Perhaps one-half of the land is cleared and under cultivation or is used for pasture, and the rest supports a forest growth of black gum, sweetgum, beech, sycamore, hickory, and some oaks, together with an undergrowth of alder and rattan vines.

Pasture grasses do well on all except the more gravelly spots of this mixed soil. Corn is the main crop grown, and yields range from 20 to 40 bushels an acre. Millet, sorgo, and cowpeas (for hay) give fair returns. The best use for this soil is pasture, the production of corn on the spots of better soil, that is, the brown silt loam areas, and forestry on some of the more gravelly or most poorly drained areas.

**Guin very fine sandy loam.**—Guin very fine sandy loam varies greatly in the color and texture of both the surface soil and subsoil. It includes many small areas of Atwood silt loam, Cuthbert very fine sandy loam, a few small eroded areas of Savannah silt loam, and all variations and mixtures of these soils.
This soil occurs on slopes, narrow ridges, and rather sharp knolls. Topographically it occupies an intermediate position between the smoother ridge tops and the steeper slopes and hillsides. Most of the land is greatly eroded and in places many gullies have formed. In a few places, particularly in some of the smoother areas where erosion has not invaded the forested land, the texture of the surface soil is fine sandy loam.

This soil occurs in the northwest corner of the county in several small bodies, mainly along the Hardin County line. Probably 15 percent of the land was at one time cleared and farmed, but after a few years of clean cultivation, erosion became so active that many fields have been allowed to lie idle and are now growing up to old-field pine. The forested areas are covered largely with pines and there are some hardwoods. Because of its mixed condition, its sloping surface relief, and its susceptibility to serious erosion when cultivated, Guin very fine sandy loam should be used for forestry. Both hardwoods and pines do well.

**Guin very fine sandy loam, gravelly phase.**—The gravelly phase of Guin very fine sandy loam occurs in the northwestern part of the county mainly on the eastern side of the large areas of Guin soils, undifferentiated. In places it adjoins a similar soil mapped in Hardin County, Tenn. Most of this gravelly soil lies west of Cypress Creek, and large bodies are east and northeast of Gravelly Springs.

There is no uniformity in this soil, as regards texture or structure, except that it is all more or less very fine sandy loam or fine sandy loam. The underlying material ranges in color from yellow to light red and in texture from silty clay loam to heavy very fine sandy clay. Small rounded chert gravel and some rounded quartz gravel are present on the surface, and in many places they constitute from 20 to 60 percent of the soil mass. Many gravel are in the subsoil, and in some places this layer is a mass of gravel, together with a small quantity of yellow or reddish-yellow silty clay material. In some places, at a depth ranging from 3 to 5 feet, the material is merely a bed of gravel weakly cemented with iron material or filled in with clay.

This soil has a broken or hilly surface relief characterized by rounded hills, knobs, narrow winding ridges, and steep slopes. All the land is well or excessively drained. Erosion has been severe in the areas which have been cultivated, and many gullies have formed.

Only a small percentage of this land has been cleared and cultivated. Most of it is too steep for general farming purposes. The uncleared areas support a growth of post oak, white oak, Spanish oak, hickory, chestnut, and black walnut, together with a few cedar and pine. The soil is of low agricultural value, and all the steeper areas should be left in forest or be replanted to trees. The underlying gravel is valuable for road surfacing, railroad ballast, and use in concrete construction.

**Guin soils, undifferentiated.**—Guin soils, undifferentiated, is a land type characterized by rough topographic features consisting of a series of high, rounded, narrow, winding ridges, numerous knobs, steep slopes, steep hillsides, and bluffs. On the high ridge, known as Pea Ridge, in the northern part of the county, the slopes are steep and severely dissected by streams heading in the sides, and the lower
slopes have deep narrow channels ranging from 100 to 350 feet in depth below the highest part of the ridge crest. This ridge is 850 feet high in the highest places, with an average elevation around 650 or 700 feet, and it drops to an elevation of 420 feet near Tennessee River.

There is no uniformity in either surface soil or subsoil, as spots of Atwood, Cuthbert, and Savannah soils, and a mixture of them are included. The surface soil ranges from silt loam to fine sandy loam and contains an abundance of rounded or elongated smooth chert gravel and some quartz gravel. The gravel range from about one-fourth to 1 inch in diameter, and some are larger. In places there is no real subsoil material, only a bed of rounded gravel, which represents the remnants of an old coastal-plain deposit. The gravel and chert fragments are valuable in the surfacing of roads. This condition exists in the northern part of the county. Bordering the bottom lands along Tennessee River and some of the larger creeks, there is a mass of broken angular chert, particularly on the steeper slopes, and in some places solid limestone outcrops in the form of perpendicular walls. Apparently, all this soil is underlain at different depths by limestone or cherty limestone. The overlying materials of the coastal plain are thickest in the northern part of the county, and they thin out toward the south.

In the northern part, where the old coastal-plain material is thickest, rosemary and old-field pines do well, and in the southern part hardwoods predominate on areas where the influence of limestone is noticeable.

With the exception of very small areas here and there, these soils are nonagricultural, owing to their steepness and content of gravel. Forestry is the best use for this land. It is said that good old-field pine timber can be produced in 30 years; that is, timber of sufficient size for the production of lumber. Most of the land is held in large tracts by lumber and crosstie companies which are cutting the merchantable timber.

**AGRICULTURAL METHODS AND MANAGEMENT**

Practically all the soils of Lauderdale County are deficient in organic matter. When they were cleared of the original forest growth there was only a small quantity of organic matter in the topmost 1 to 3 inches of soil, and this was soon lost through clean cultural practices, leaching, oxidation, and erosion. One of the principal needs of these soils is large quantities of organic matter. As there is only a small quantity of manure produced in the county annually, the farmers realize the necessity of turning under green-manure crops, in order to obtain a supply of organic matter. This is being done by a number of farmers through the use of summer legumes and winter cover crops. Cowpeas and soybeans, following oats, are used in a 3- or 4-year rotation by some farmers. Where oats, wheat, and rye cover the soil during the winter, erosion is prevented to a great extent. Through clean cultural practices the soils

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*The information and recommendations in this section are based largely on information furnished by G. V. Phillips, county agricultural agent for Lauderdale County, and by the Alabama Agricultural Experiment Station.*
are subject to erosion and become leached of a large quantity of soluble plant nutrients. Many of the farmers who practice diversification of crops have terraced a large part of their land and are using vetch or Austrian winter peas to aid in the control of erosion during the winter and for improvement of the soil. Under such a method increased yields (ranging from 10 to 20 bushels an acre) of corn have been obtained. Hogging off of corn and soybeans planted in alternate rows and velvetbeans planted with the corn is practiced by some farmers. Kudzu is being used by a number of farmers to check erosion and to add organic matter to the soil. Some farmers strip crop a part of the slopes and sow either grass or lespedeza.

A few farmers in the eastern or central parts of the county spread ground limestone or pulverized limestone over the land. This improves the soil for the production of winter cover crops and other legumes. Dewey gravelly loam and Baxter loam, gravelly phase, produce from fair to good Bermuda and orchard grasses. By applying lime to the soil, sweet, white, and red clovers can be successfully grown. Pulverized limestone may be obtained from a local plant and from a lime quarry in Franklin County.

Experiments on soils similar to those in Lauderdale County have been carried on by the Tennessee Valley substations and the experiment station at Auburn over a period of years. The following information and recommendations regarding fertilizers, crop varieties, and methods of cultivation are based largely on results obtained from these experiments.

As cotton is the principal cash crop for this part of the State and as practically every farmer grows at least some, more study has been made by the experiment stations regarding the fertilizer needs for this crop than of the requirements for other crops. Results of the experiments show that a fertilizer analyzing 6–8–4 has proved the most desirable mixture, or the mixture which seems to meet the requirements of the soils. Applications ranging from 400 to 600 pounds an acre are recommended. A few farmers buy fertilizer ingredients and mix their own fertilizer, using 25 pounds of nitrate of soda or its equivalent, 300 pounds of superphosphate, and 48 pounds of muriate of potash. A 4–8–4 fertilizer may be used if a side dressing of 25 pounds of nitrate of soda is used to each 100 pounds of base fertilizer. This is the Auburn minimum method, and double these quantities is the Auburn maximum method. Most of the farmers in this county use ready-mixed fertilizers, such as 4–10–4, 4–8–4, or 3–10–3. These fertilizers are easier to apply and do not require so much handling as those which are home mixed. They do not give maximum efficiency, however, and are more expensive per unit of plant nutrients.

The cotton varieties recommended as the best producers and having a good staple are D. P. L. 4–8, Cook 1627, and Addison’s Improved Prolific. Probably 50 percent of the farmers use these varieties. Owing to the almost total discontinuance of a premium on length of staple, a higher percentage of lint turn-out for the short-staple varieties, and to a rather widespread opinion that Half-and Half cotton yields best on poor and unfertilized land, the long-staple varieties have not become so popular as was expected. Half-and-
Half, a short-staple variety, produces from 40 to 46 percent of lint, and it is very popular.

Nitrogen is the principal fertilizer ingredient needed for the production of corn. The cheapest and most economical form is organic nitrogen obtained from turning under a winter cover crop that has been fertilized with lime or basic slag, or through the use of barnyard manure. Should these organic forms not be available, sodium nitrate or its equivalent, applied at a rate ranging from 100 to 200 pounds an acre as a side dressing when the corn is about knee-high, is recommended. Only a small proportion of the corn grown in this county is fertilized with commercial fertilizers. Huntington silt loam and Abernethy silt loam, light-colored phase, are the principal soils used for the production of corn in the first bottoms and depressions, and they are naturally fertile, requiring no fertilization.

The corn varieties recommended for the county are Jarvis Golden Prolific, Neal Paymaster, Douthit, Whatley Prolific, Indian Chief, Mosby, and Hastings Prolific. The prolific varieties and Neal Paymaster are particularly adapted for the sandy mountain soils. The Mosby variety is grown to a large extent in the river bottoms.

High-priced cotton land does not lend itself to the raising of livestock, therefore silage has not been given much consideration in this section of the State. With the advent of the trench silo, however, recognition of the importance of silage is increasing, and there is a promising future for home use of this feed.

Wheat is not commonly grown, owing to the more economical production of cotton. Wheat is recommended under certain conditions as a combination winter cover and pasture crop. Alabama Bluestem is the most popular variety. The fall-grown oats recommended are Red Rustproof and Fulghum, and some Winter Turf oats are grown. These varieties are much higher producers than the spring-grown varieties, but they frequently winter-kill. They should be fertilized with 100 pounds of nitrate of soda an acre in the spring. The principal reason for the low acreage devoted to this crop is the result of its time of harvest interfering with the preparation of cotton land.

The soybean varieties recommended are Mammoth Yellow, Otootan, and Laredo, Otootan being the most popular. The Mammoth Yellow variety is particularly well adapted to the first bottoms and swales, as it survives short periods of overflow. The other two varieties produce a smaller stalk than the Mammoth Yellow and are more digestible. An acre application ranging from 200 to 400 pounds of basic slag an acre is recommended as a fertilizer for soybeans. The Whippoorwill cowpea is a very popular variety and is highly recommended. It is particularly well adapted to a rotation in which it follows spring potatoes or oats, as its period of maturity is shorter than that of soybeans. Fertilization is the same as for soybeans.

Alfalfa is a minor crop. The limestone valley soils are well adapted to this crop, but a heavy application of basic slag or lime and superphosphate is required for best results.

The Lespedeza, Kobe, Tennessee 76, and common, are recommended for the soils of this county. An acre application ranging from 300 to 400 pounds of superphosphate or the lime equivalent of basic slag
has proved very profitable. The ability of the lespedezas to thrive on extremely poor soils and the high quality of the hay obtained have made them very popular. The common lespedeza (Japan clover) is the basic pasture crop in most of the native pastures. In 1934 there were 20,000 acres sown to Kobe and Tennessee 76 varieties, most of which was sown for hay and pasturage.

According to results obtained at the Tennessee Valley experiment station, good Tennessee Valley land properly treated, seeded, and cared for will make first-class pastures. The following mixture (to the acre) is recommended for use in the pastures: 15 pounds of orchard grass, from 15 to 20 pounds of Kentucky bluegrass, one-half pound of hop clover, 1 pound of black medic, and 5 pounds of redtop. Lespedeza should be added if not already present, and Dallis grass may be planted. Livestock, however, prefer the bluegrass and orchard grass. The pastures should be fertilized with 1,500 to 2,000 pounds of basic slag to the acre every 3 or 4 years.

Triumph is the most popular variety of potato, and some Jersey Red Skin and Irish Cobbler are grown. The Nancy Hall and yam varieties of sweetpotatoes are the more popular. They are grown chiefly for home consumption and local markets, and they are fertilized mainly with barnyard manure. When fertilized with commercial fertilizers, an acre application ranging from 500 to 1,000 pounds of a high-analysis fertilizer is required. The percentage of potash is higher than that used for general crops.

In the past a large revenue has been realized through the marketing of timber from the rough broken areas. The present tree growth is small and returns little revenue in comparison. In some sections of the county small timber is being cut and sold to the paper mills to such an extent that the land is becoming deforested. For more economical returns, according to the State extension forester, forest fires should be eliminated, the more merchantable timber, such as pines, white oak, red oak, hickory, poplar, ash, and cedar, should be protected in their respective habitats, and a large proportion of the trees should be allowed to reach maturity.

The commercial production of fruits is negligible in the agriculture of the county. A large number of scattered orchards supply enough fruit for home needs and some for local markets, but not enough is grown to supply the demands for the entire population. The soils and climate are favorable for the production of fruit, as attested by the fine quality of peaches grown in the vicinity of Leighton. Other fruits, such as apples, pears, cherries, quinces, apricots, plums, and grapes, can be grown successfully.

Lauderdale County has been primarily a cotton-growing section, and very little attention is given to the raising of cattle and hogs. Not enough meat is produced to meet the home demands. Many of the soils are potentially good and can be built up to a fair state of productivity if manured or if leguminous crops are turned under. By keeping more dairy and beef cattle, more manure can be made, and when this is applied to the soils larger yields of hay and corn and better pastures are obtained. By such methods these good soils will be improved to a condition where any crop common to the county can be grown successfully.
SOILS AND THEIR INTERPRETATION

Lauderdale County is located in the limestone valley section of northwestern Alabama, in the Tennessee Valley. The county lies near the border line of the Gray-Brown Podzolic soils and the Yellow and Red soils groups. Associated with the Red Soils are grayish soils which, because of poorer drainage and less than normal erosion, have profiles varying from the normal. These soils show some podzolization, whereas the Red soils are to some extent lateritic.

The soils have developed under forest cover dominantly of deciduous trees, although in the northwest corner there originally were some coniferous trees. The forest growth, together with a long summer season and high rainfall, has not been conducive to the accumulation of organic matter in the soil. In the forested areas there is a thin veneer of leaf mold on the surface, and in the topmost 1 to 3 inches of the soil a small quantity of organic matter is present. The soils range in color from light gray to brown.

In this section of heavy rainfall and moderately warm temperature, leaching and erosion, which continue throughout the year, as the ground is seldom frozen and then for only short periods, have been two important factors in active operation on the soluble plant nutrients. Because the soils were cleared of their original forest growth and clean cultivation has been practiced by man, surface erosion has been active and is still going on. All the soils having normally developed soil profiles show eluviation in the A horizon and considerable illuviation in the B horizon. The solum for the various soils ranges in thickness from 3 to 20 feet. In many places where the soils have been poorly managed the original A horizon has been removed by surface erosion, and in some places both the A and B horizons have been destroyed by deep gullies.

The soils of the county range from slightly acid to acid. Although most of them are underlain by limestone, no accumulation of calcium carbonate is present in the solum. Throughout the greater part of the county chert material is conspicuous, not only on the surface but in many places throughout the solum, and in the northwestern part small rounded chert gravel occur in abundance.

As there are no great differences in the climate and native vegetation in this county, the distribution of the soils is largely determined by the distribution of the parent material, and a direct relationship exists between the large and important soils and the underlying parent material. Surface relief also plays an important part. Nevertheless, it must not be overlooked that the most important factors determining the character of the soils are native vegetation and climate. The principal underlying formations are the Tuscaloosa (consisting of Warsaw and St. Louis limestones and Fort Payne chert) and the Tuscaloosa. The Warsaw and St. Louis limestones are the nearly pure limestones. The St. Louis is a thick-bedded dark-colored fine-grained limestone, and the Warsaw is coarsely crystalline dark-gray or light-gray limestone more or less cross-bedded and containing some highly fossiliferous chert. This formation is

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200 feet thick at Sheffield, where there is a bluff 100 feet high. In this county the principal areas of these limestones are in the bend of the river between Florence and Smithsonia, around Oakland, and east and north of Florence. Several bodies are in the eastern part, especially around Center Star and east and south of Rogersville. These limestones have weathered to a much greater depth than the Fort Payne chert. In the process of weathering, which was in the form of dissolution of the lime, the limestones have left materials which, through the soil-forming and soil-building processes, have given rise to soils of the Dewey and Baxter series. Baxter stony loam is derived largely from an impure or highly siliceous limestone or cherty limestone, and it contains a large quantity of angular chert fragments.

The Fort Payne chert, which underlies more than 60 percent of the county, is a coarsely crystalline, highly fossiliferous, thick-bedded crinoidal limestone. This formation is 200 or more feet thick in many places in Lauderdale County. It is an impure limestone, as contrasted to the pure limestones of the Tuscumbia formation. As the Fort Payne chert passes through the processes of weathering, a large quantity of angular chert fragments, which represent the greater part of the impurities in the formation, remain. The C horizon consists of a matrix of sharp angular chert fragments, together with red, gray, and yellow silty clay. The soil-building and soil-forming processes have acted on this weathered material and have formed the soils of the Dickson and Guthrie series.

In the northwestern part on the high ridge tops north of Wright, in the vicinity of Dart, and along the Tennessee State line, is the old coastal-plain material now remaining in Lauderdale County. This consists of light and variously colored irregularly bedded sands, clays, and gravel. It ranges from a few feet to 50 or more feet in thickness and rests on the Fort Payne chert or in some places is underlain by the Tuscumbia formation. A well in the northwest section of the county shows that at one place unconsolidated material containing some mica extends to a depth of 40 feet. This rests on a layer composed of chert gravel and angular chert fragments from 3 to 4 feet thick, and below this is the unweathered chert. This old coastal-plain material evidently at one time covered a large part of this section but was removed through erosion. This formation contains more very fine sand or fine sand than is present in the limestone formations and, therefore, one type of very fine sandy loam is developed only in this part of the county. The soil-forming processes have acted on the deposits of the old coastal-plain material and have produced the Savannah, Atwood, Cuthbert, and Guin soils. A characteristic feature of these remnants of an ancient coastal-plain deposit is subsoil cementation. Wherever the lack of pronounced surface relief is, or was, the initial cause of retarded drainage, factors became operative, which have produced the motting and cementation peculiar to the subsoils of the smoother Savannah soils.

Alluvial material lies along Tennessee River and many of the larger creeks. This material was brought down by Tennessee River and its tributaries in the Tennessee Basin and has been deposited at times of overflow. Some of the alluvial material occurs on the built-
up second bottoms and high terraces and has lain in these well-
Drained positions for sufficient length of time to have developed a
normal soil profile, whereas the materials in the first bottoms are of
such recent age that no normal soil profiles have developed.

The soils of Lauderdale County have been grouped in series based
on the color, structure, thickness of the horizons, surface relief, drain-
age, and parent material. Within the soil series are soil types defined
according to the texture of the A horizon. The soils which have
developed normal soil profiles are Dewey silt loam, Dewey loam, Bax-
ter loam, Dickson silt loam, Savannah silt loam, and Atwood silt
loam, of the uplands; and Cumberland silt loam and Elk silt loam
of the terraces. Other soils, by reason of steep broken surface relief,
inherently poor drainage, or recently deposited alluvial material,
have not developed normal soil profiles. The differences between
these soils can be brought out in descriptions of a few profiles of
some of the important soil types. Following is a description of a
profile of Dewey loam, as observed in the river-bend part of the
county:

A. 0 to 5 inches, mellow friable brown or reddish-brown loam.
A. 5 to 13 inches, light reddish-brown silty clay loam which is heavier than
the material in the layer above. It breaks into irregularly shaped lumps
which are easily crushed to a friable mass.
B. 13 to 24 inches, reddish-brown clay.
B. 24 to 60 inches, light brownish-red or red clay. The two "B" layers
constitute the most uniformly colored and the heaviest material in the
profile. The clay breaks into irregularly shaped lumps and under good
moisture conditions is easily crushed to small granules. A few very small
round soft black speckings or rounded accretions are present in these
layers.
C. 60 to 80 inches +, light brownish-red and yellow clay containing some
almost white soft chert particles.

The Dewey soils have the deepest somol of the soils in this county.
Erosion is and has been active on these soils, and in many places
the original A horizon has been removed. Dewey silt loam differs
from Dewey loam mainly in the texture of the A and B horizons.
Dewey gravelly loam, particularly the slope phase, does not have a
normally developed profile in all places. Large quantities of chert
fragments occur on the surface and throughout the profile, particu-
larly in the C horizon.

The Baxter soils differ from the Dewey soils, in that the A1 and
A2 horizons are lighter in color, ranging from yellowish gray to
light brown. The Baxter soils also have a slightly compact B hori-
zon which is redder than the corresponding layer in the Dewey soils.
Some mottles and some lamination show in the lower part of this
horizon. The Baxter soils may be considered intermediate between
the Dewey soils and the Dickson soils. They merge to greater or
less extent into the Dickson soils. Baxter loam and Baxter loam,
gravelly phase, have developed normal soil profiles, whereas Baxter
stony loam, because of its steep surface relief and the presence of a
large quantity of angular chert, particularly in the B and C hori-
zons, has not developed a normal soil profile.

Abernethy silt loam, light-colored phase, is the only member of
the Abernethy series in this county. This soil occurs in slight de-
pressions and sinks, mainly within areas of Dewey loam and to less
extent within areas of Baxter loam. It has been formed by the
washing out of materials from these two soils and their deposition at times of heavy rainfall in the depressions. The Abernethy soils in this county are lighter in color than the typical Abernethy soils in other counties in Alabama.

A description of a profile of Dickson silt loam in sec. 12, T. 1 S., R. 7 W., one-fourth mile north of Bethel Church follows:

A. 0 to ½ inch, a layer of mold composed mainly of partly decomposed leaves and twigs, together with a small quantity of mineral matter.

Aa. ½ to 7 inches, light-gray or yellowish-gray silt loam which has a floury feel and a single-grain structure.

B. 7 to 22 inches, yellow or brownish-yellow heavy silt loam or silty clay loam, which breaks into irregularly shaped lumps and is easily crushed into a friable granular mass. The material is uniform in color and consistence. The root channels and insect burrows are coated with gray and are filled with gray silty material.

Ba. 22 to 28 inches, the so-called hardpan, or claypan, layer which is a dry hard compact layer, mainly silty clay loam, of mottled light-gray and yellowish-brown colors. This material is hard and brittle when dry. It has a somewhat laminated structure or shows some stratification.

C. 22 to 65 inches, mottled light-gray, yellow, and red silty clay material containing some soft angular chert fragments. Below a depth of 50 inches the material becomes heavier and slightly plastic. The chert fragments increase with depth. At a depth of about 58 inches the material consists of a matrix of red and gray clay containing angular partly decayed chert fragments.

The Guthrie soils are associated with the Dickson and Dewey soils. They occur in the depressions and sinks and are naturally poorly drained. This condition gives rise to strong mottlings in the B horizon and to the light color in the A horizon.

The Savannah soils, derived through the soil-forming processes from the weathered products of the unconsolidated beds of sands, clays, and gravels superimposed on the Fort Payne chert, have a color profile similar to that of the Dickson soils. They may be considered the mature or postmature soils of the county. The Savannah soils are characterized by a hardpan layer which, however, is not quite so well developed as in the Dickson soils. The laminated or platy characteristics of the Dickson hardpan are not present or are poorly developed in the Savannah soil. In most places some red mottlings occur in the Savannah hardpan, whereas red is present in few places in the Dickson hardpan. The C material of the Savannah soil contains a large quantity of rounded chert gravel, whereas underlying the Dickson soil there is a large quantity of angular chert.

The Atwood soils are closely associated, both in origin and occurrence, with the Savannah soils, and their textural and structural characteristics are somewhat similar. The B horizon of the Atwood soils is yellowish red or yellowish brown, as contrasted to the yellow or brownish-yellow color of the B horizon in the Savannah soils. In the Atwood soils the hardpan, or claypan, layer is not so well developed as in the Savannah soils.

The Cuthbert soils differ from the Atwood in having a tough, tight, compact B horizon and a heavy C horizon. In places the Cuthbert and Atwood soils merge with each other, making separation rather difficult.

The Guin soils represent a land type rather than a definite soil series. These soils include spots of Savannah, Atwood, and Cuth-
benton soils occurring in such small areas that they could not be separated on the soil map. The Guin soils include areas which have been subjected to serious erosion, and most of the areas range from rolling to broken and hilly. Most of the Guin soils contain a large quantity of rounded chert gravel and some rounded quartz gravel. At the bases of some slopes, where the old coastal-plain material is underlain by limestone, angular chert fragments are present. Some locally formed iron-cemented coarse conglomerate, composed of rounded pebbles of both quartz and chert, and some subangular chert occur in the Guin soils.

The Cumberland and Elk soils are developed on the second bottoms and terraces of Tennessee River and some of the larger creeks. These soils have developed a normal soil profile. The Cumberland soils are characterized by a brown or reddish-brown A horizon and a red B horizon. The Elk soils differ from the Cumberland in having a light-brown or brown A horizon and a yellowish-brown B horizon.

The soils of the Lindside series are light colored in the A horizon, and they have a mottled yellow and gray B horizon which contains a large quantity of soft iron accumulations. These soils are not so well drained as either the Cumberland or Elk soils.

The Huntington soils are developed in the first bottoms along Tennessee River and some of its larger tributaries. The soil profile is dominantly brown to a depth ranging from 3 to 4 feet, and for the most part the material is of uniform texture and color. The heavy-subsoil phase of Huntington silt loam has an extremely heavy B horizon.

The Melvin soils are developed in the first bottoms. They are poorly drained, light colored in the A horizon, and have a mottled yellow, brown, and gray B horizon. The materials composing these soils have been washed mainly from the limestone soils.

The results of mechanical analyses of two soils are given in table 4.

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<th>Soil type and sample no.</th>
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Determinations of the pH values of several soils of this county have been made in the laboratories of the Bureau of Chemistry and Soils by the hydrogen-electrode method. The data in table 5 indicate the results of these determinations.
**Table 5.**—*pH* determinations for several soils from Lauderdale County, Ala.

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<th>Soil type and sample no.</th>
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<th>pH</th>
<th>Soil type and sample no.</th>
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Lauderdale County lies in the limestone valley of the Tennessee River Basin of Alabama. The Wilson Dam across Tennessee River at Muscle Shoals is only 3 miles distant from Florence, the county seat. The county is strategically located in reference to the large hydroelectric development.

The climate is moderately mild, and the rainfall is abundant and well distributed throughout the year. The climate, in combination with the good agricultural soils, renders the production of crops of a wide variety profitable, especially cotton.

About 60 percent of the soils have a surface relief favorable for agricultural operations; about 15 percent of the land is decidedly rolling or steeply sloping, and such areas are suited for pasture; and the remaining 25 percent is too rough, steep, and broken for farming operations but can be used advantageously for forestry.

All the land is well drained, with the exception of a few areas of the first-bottom soils and the numerous sinks and depressions, the latter being conspicuous features of the landscape.

There are two main classes of soils—the red soils and the associated gray soils—all of which are derived through the soil-forming processes from limestone and cherty limestone, except those in a comparatively small area in the northwestern part of the county and the alluvial soils.

The red soils have been classed in the Dewey and Baxter series. Dewey loam is the most important type of soil in the valley proper. It consists of brown loam underlain by reddish-brown or red firm but moderately friable silty clay loam or clay. Most of this soil is held in large tracts and is used for the production of cotton. It is used to less extent for the production of corn and other subsistence crops. In this section the tenant system of farming prevails. Baxter loam is closely associated with the Dewey soils but it is farmed more nearly
like the gray-land soils. Formerly corn, wheat, oats, and hay crops were successfully grown on these red lands.

Associated mainly with the red soils are the Huntington and Elk soils, in the first bottoms and on the terraces, and the Abernethy in the depressions and sinks. Huntington silt loam and Abernethy silt loam, light-colored phase, are the premier corn soils.

Of the gray soils, Dickson silt loam is the most important both areally and agriculturally. On this soil, together with small areas of Savannah silt loam, Atwood silt loam, and Cuthbert very fine sandy loam, diversified or a self-sufficing type of agriculture is practiced. In the region of gray soils the farms are small and most of them are operated by the owners. The greater part of the farm work is carried on by the farmers and members of their families.

The rough broken lands will produce good merchantable timber within 30 to 40 years. The poorly drained soils can be used for either pasture or forestry.

Considering the inherent qualities of many of the soils and their susceptibility to improvement, Lauderdale County offers advantages for a more diversified agriculture. There appears to be no reason why many of these potentially good soils cannot be built up to a fair or even high state of productivity.
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Office of the Assistant Secretary for Civil Rights  
1400 Independence Avenue, SW  
Washington, D.C. 20250-9410;

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