

Issued September 25, 1916.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE ARKANSAS AGRICULTURAL EXPERIMENT STATION  
MARTIN NELSON, DIRECTOR.

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SOIL SURVEY OF JEFFERSON COUNTY,  
ARKANSAS.

BY

B. W. TILLMAN, IN CHARGE, R. R. BURN, W. B. COBB, AND  
CLARENCE LOUNSBURY, OF THE U. S. DEPARTMENT  
OF AGRICULTURE, AND G. G. STRICKLAND, OF THE  
ARKANSAS AGRICULTURAL EXPERIMENT STATION.

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HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

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[Advance Sheets—Field Operations of the Bureau of Soils, 1915.]



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1916.

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF SOILS,  
*Washington, D. C., March 8, 1916.*

SIR: In the extension of the soil survey in the State of Arkansas a survey was made of Jefferson County during the field season of 1915. This work was done in cooperation with the agricultural experiment station, and the selection of the area was made after conference with State officials.

I have the honor to transmit herewith the manuscript report and map covering this area and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1915, as provided by law.

Respectfully,

MILTON WHITNEY,  
*Chief of Bureau.*

Hon. D. F. HOUSTON,  
*Secretary of Agriculture.*

## CONTENTS.

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	Page.
SOIL SURVEY OF JEFFERSON COUNTY, ARKANSAS. By B. W. TILLMAN, IN CHARGE, R. R. BURN, W. B. COBB, and CLARENCE LOUNSBURY, OF THE U. S. DEPARTMENT OF AGRICULTURE, and G. G. STRICKLAND, OF THE ARKANSAS AGRICULTURAL EXPERIMENT STATION.....	5
Description of the area.....	5
Climate.....	8
Agriculture.....	9
Soils.....	16
Caddo sandy loam.....	19
Caddo silt loam.....	20
Caddo very fine sandy loam.....	22
Norfolk very fine sandy loam.....	23
Ruston fine sandy loam.....	23
Ruston very fine sandy loam.....	24
Susquehanna fine sandy loam.....	25
Susquehanna very fine sandy loam.....	25
Susquehanna clay loam.....	26
Lufkin silt loam.....	27
Portland very fine sand.....	28
Portland very fine sandy loam.....	28
Portland silt loam.....	31
Portland silty clay loam.....	32
Portland clay.....	32
Ochlockonee very fine sandy loam.....	34
Ochlockonee silt loam.....	34
Bibb silt loam.....	34
Yahola clay.....	35
Miller fine sand.....	35
Miller very fine sandy loam.....	36
Miller clay.....	36
Summary.....	37

## ILLUSTRATIONS.

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### FIGURE.

	Page.
FIG. 1. Sketch map showing location of the Jefferson County area, Arkansas..	5

### MAP.

Soil map, Jefferson County sheet, Arkansas.



# SOIL SURVEY OF JEFFERSON COUNTY, ARKANSAS.

By **B. W. TILLMAN**, In Charge, **R. R. BURN**, **W. B. COBB**, and **CLARENCE LOUNSBURY**, of the U. S. Department of Agriculture, and **G. G. STRICKLAND**, of the Arkansas Agricultural Experiment Station.—**HUGH H. BENNETT**, Inspector.

## DESCRIPTION OF THE AREA.

Jefferson County, Ark., lies just southeast of the center of the State. The eastern boundary is about 30 miles west of the Mississippi River, and the southern boundary about 70 miles north of Louisiana. It is bordered on the north by Saline, Pulaski, and Lonoke Counties, on the east by Arkansas County, on the south by Lincoln and Cleveland Counties, and on the west by Grant County. Excluding a narrow, irregular extension to the east along the Arkansas River, the county is approximately square. Its total area is 878 square miles, or 561,920 acres.

Jefferson County comprises two general divisions, an upland plain and a lower river flood plain. The upland plain is in the western part of the county, having a maximum width of about 16 miles along the southern boundary. Topographically it is level rather than rolling, although it includes small undulating to gently rolling areas, with a belt of relatively smooth country in the southern part of the county along Bayou Bartholomew.

The lowland, or river-bottom section, is a nearly level plain bordering the Arkansas River, with narrow tongues reaching into the uplands along the smaller streams. It is by far the most extensive division, covering about two-thirds of the total area of the county. It comprises all the territory north and east of the Arkansas, as well as most of the region southeast of Pine Bluff between Bayou Bartholomew and the river. Its surface is predominantly level and smooth, although there are occasional depressions, representing abandoned stream channels, as well as slight swells and hummocks.

The border line between the bottom land and upland is usually marked by sharp slopes 10 to 20 feet high. In places, however, notably in the vicinity of Pine Bluff along the Tamo Road, the

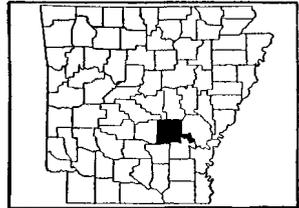


FIG. 1.—Sketch map showing location of the Jefferson County area, Arkansas.

transition from the bottom land to the upland is marked by a gradual rise. All the bottom land has been overflowed in times past, but is now mainly protected by extensive levees. All the county, both bottom land and upland, is topographically well suited to cultural operations.

The county has a general but imperceptible slope from northwest to southeast. The elevation at Redfield, in the northwestern part of the county, is given by the U. S. Geological Survey as 307.5 feet above sea level. The elevation at Tamo, in the southeastern part of the county, is 192 feet. The highest recorded elevation is 340 feet, at Jefferson.

Most of the drainage of the county finds its way to the Arkansas River, which enters the county in the northwestern part and, flowing in a southeasterly direction, divides it into two almost equal parts. Most of the region south of the river is drained by Bayou Bartholomew, which rises near Hardin and, roughly paralleling the Arkansas River, leaves the county south of Ladd. Bayou Meto, through its tributary Bayou Wabaseka, drains the eastern part of the county, and Big Creek carries the drainage of the southwestern part. The smaller streams have low gradients, and their currents are swift only at high-water stage. The cutting down of stream beds is therefore slow.

The Arkansas River is bordered on the north by broad, extensive bottoms. The belt of bottom land along its south and west sides from the northern county line to the vicinity of Pine Bluff is narrow, but south of this point it widens out rapidly, and includes almost all the region between Bayou Bartholomew and the river. The drainage of much of the forested upland is deficient, owing to the level topography. Many of the streams of this section are intermittent.

All the upland originally was forested with pine and oak, and although most of this growth has been removed, there are still extensive areas of merchantable timber. Very little of the cut-over land has been cleared for farming, and not more than 35 per cent of the upland is in cultivation.

The original forest growth on the bottom land consisted of white, black, post, and overcup oak, hickory, elm, gum, pecan, hackberry, and cypress. There are only a few small tracts of the original timber in the bottoms, and these are found in areas of heavy, poorly drained soils. It is estimated that about 70 per cent of the bottom land is in cultivation.

Many small sawmills are operating in different parts of the county and lumbering is still an important source of revenue. Considerable oak and hickory lumber is being cut in the extreme eastern

part of the county along Bayou Meto, where much of the land is subject to annual overflow.

A large proportion of the white farmers of the county have immigrated from other Southern States, mainly Mississippi, Tennessee, Kentucky, North Carolina, South Carolina, and Georgia. The total population of the county is reported in the census of 1910 as 52,734, 71.4 per cent of which is classed as rural. The population is well distributed over the bottom land, but extensive areas of uplands are sparsely settled. Seventy-one per cent of the population of the county is negro. There are some settlements in the uplands in which the population is mainly white, and the proportion of whites is larger in the vicinity of Altheimer than elsewhere in the county.

The first settlement was made in the neighborhood of New Gascony in 1817. Another settlement was made at Pine Bluff in 1819. The Territory of Arkansas was created in 1819, and Jefferson County was organized in 1829. The county seat was located at Pine Bluff. It was removed in 1832 to a place 3 miles down the Arkansas River, but shortly afterwards was again established at Pine Bluff, where it has since remained.

Pine Bluff, on the Arkansas River, has always been the principal town of the county. By 1860 it had become an important cotton market, as well as a distributing center for surrounding counties. The Civil War completely demoralized business and practically depopulated the town. Industrial development was resumed about 10 to 15 years after the close of the war. The population of Pine Bluff is reported in the 1910 census as 15,102. It has a cotton compress with a capacity of 700 bales daily, and a cottonseed-oil mill with a capacity of 15,000 tons of seed annually. A packing plant has been in operation for a few years, but with only fair success, owing to the general lack of interest in raising live stock. Pine Bluff is the main distributing center not only for the county, but for a large section along the Mississippi River.

Altheimer is the second largest town in the county. It is located on the main line of the St. Louis Southwestern Railway (Cotton Belt Route) in the eastern part of the county. Wabbaseka, Tucker, Sherrill, New Gascony, Faith, Redfield, Noble Lake, Fairfield, Moscow, and Tamo are railroad stations. There are a number of other small towns and settlements in the county.

The shipping facilities are good. River transportation is possible, but shipments are made by rail. The main line of the St. Louis Southwestern crosses the county in a northeast-southwest direction, and a branch of this line, the Pine Bluff & Arkansas River Railway, extends from Robroy to Waldstein, in the southeastern part of the county. Another branch line of this system extends northwest from

Altheimer to Little Rock. The St. Louis, Iron Mountain & Southern Railway crosses the county in a northwest-southeast direction, roughly parallel with the Arkansas River. A branch of the same road from Pine Bluff affords transportation to points west of the county. The Anderson & Saline River Railroad crosses the southwestern corner.

The county has two improved highways. A concrete road connects Pine Bluff and Little Rock, and a macadamized road, known as the Tamo Pike, extends from Pine Bluff southeastward into Lincoln County. Some of the other main roads of the county are graded, but aside from these the dirt roads are in poor condition in wet seasons, often being impassable. During the dry season all the roads usually are in fair condition.

Rural telephone service reaches all parts of the county and all sections are supplied with free rural mail delivery.

#### CLIMATE.

In general, the climate of Jefferson County is typical of that of the northern part of the Gulf Coastal Plain. The mean annual temperature is reported at Pine Bluff as 63.1° F. The mean temperature for the winter months of December, January, and February is 44.3° F. For the summer months it is 81° F. and for the spring and fall it is about 64° F. The lowest recorded temperature is -5° F. and the highest 108° F. The humidity is high.

The winters are comparatively short and mild, the ground seldom freezing to a depth of more than a few inches. Snow seldom exceeds a few inches in depth and soon melts. The early spring favors the production of truck crops for northern markets.

The mean annual precipitation is reported as 51.15 inches. The rainfall is ample, somewhat more than one-half occurring in the winter and spring months. Rainfall averages 15.36 inches for the spring months, 10.58 inches for the summer, and 10.56 for the fall months. Serious droughts are rare, the danger being rather from excessive rainfall in the winter, occurring in cold, steady down-pours, sometimes lasting two or three days and followed by clear, cold weather. As a result of these heavy rains the small streams frequently overflow, causing damage to farm land.

The average date of the last killing frost in the spring is March 26 and of the first in the fall, November 2. This gives a normal growing season of 221 days. The date of the latest killing frost recorded in the spring is April 12 and that of the earliest in the fall, October 11.

In general, the climatic conditions in Jefferson County are favorable to the production of certain grasses, grains, early vegetables, and

some fruits. The mild climate throughout the year makes it possible to keep live stock with a minimum expenditure for shelter.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded by the Weather Bureau station at Pine Bluff:

*Normal monthly, seasonal, and annual temperature and precipitation at Pine Bluff.*

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	45.3	82	5	4.89	4.34	6.87
January.....	42.5	82	6	5.87	3.59	7.17
February.....	45.0	80	-5	3.89	2.28	4.20
Winter.....	44.3	82	-5	14.65	10.21	18.24
March.....	54.5	90	12	5.60	5.50	6.22
April.....	63.6	92	30	4.61	3.99	12.53
May.....	72.0	99	37	5.15	3.20	15.71
Spring.....	63.4	99	12	15.36	12.69	34.46
June.....	79.1	104	49	3.96	.99	4.04
July.....	82.4	108	57	3.93	.46	7.84
August.....	81.4	103	52	2.69	2.82	6.03
Summer.....	81.0	108	49	10.58	4.27	17.91
September.....	75.7	106	40	3.75	4.19	4.22
October.....	63.3	96	28	2.05	2.56	3.59
November.....	52.8	87	14	4.76	3.29	4.47
Fall.....	63.9	106	14	10.56	10.04	12.28
Year.....	63.1	108	-5	51.15	37.21	82.89

#### AGRICULTURE.

The early settlers in this territory located along the Arkansas River, which at that time afforded the only means of transportation. They cleared a few acres of land, using the timber for fuel and in the construction of cabins, and grew a small quantity of corn and vegetables for food. Game and fish were plentiful, and no attention was given to live stock.

The permanent settlement of the county began about 1835, and by the time of the Civil War considerable progress had been made in agriculture. Cleared land sold for \$15 to \$20 an acre. Large tracts were operated under the plantation system. Cotton, the extensive production of which began about 1845, had become the main money

crop. It was shipped to Memphis, New Orleans, and other points by boat.

Agriculture was demoralized by the Civil War; land values reached a low level, labor conditions were in a deplorable state, and a large part of the land was thrown out of cultivation. The period of reconstruction began about 1870, and renewed interest was taken in agriculture. The population began to increase, the settlers coming mainly from the older southern States, and since that time the agricultural progress of the county has been uninterrupted.

Jefferson County is essentially agricultural in its interests. It ranks as one of the leading counties in the State. In recent years extensive drainage projects have been completed in the county, and over 70,000 acres have been reclaimed. The value of this land has increased from \$10 to \$50 or \$60 an acre. The construction of lateral ditches leading to the mains, however, has been given little attention. In many places the porous subsoil permits of successful tile draining, particularly in areas of the poorly drained phase of the Portland very fine sandy loam, and the productive capacity of the soil can be greatly increased through more adequate drainage.

Cotton, grown largely under the one-crop system, continues to be the money crop of the county, notwithstanding recent ravages of the boll weevil. According to the census, cotton was grown in 1909 on 110,800 acres, giving a production of 46,357 bales, or approximately 0.42 bale per acre. The opinion of farmers in general is that there has been some decrease in yield, owing largely to decline in the productiveness of the soils. This is probable, as cotton usually is grown continuously, and there is practically no rotation of crops. In the uplands farms occasionally are abandoned after a number of years of cropping. Some of the soils have been planted to cotton for 30 years or more in succession. Cotton is grown to the exclusion of subsistence crops, making it necessary to import large quantities of food supplies.

In the growing of cotton little attention is paid to the selection of good seed and varieties best suited to the soils. Cotton usually is planted the latter part of March or in April. It is grown on beds, and is given shallow cultivation with light implements and hand hoes. In general the methods of cultivation are very well suited to the requirements of this crop, but the prevailing system of clean cultivation, without rotations including such crops as the legumes, small grains, especially oats, and winter cover crops of other kinds, tends to diminish the organic-matter supply, with consequent lowering of productiveness. The cotton picking season extends from September to December or later.

Next to cotton, corn is the most important crop grown. According to the census of 1910, corn was grown on 27,720 acres, with a produc-

tion of 486,427 bushels. During the last few years the acreage in corn has been increased, owing to the reclaiming of bottom lands and to the demand for feed for stock. However, large quantities of corn, as well as hay and oats, are shipped into the county. The census of 1910 reports an expenditure of \$233,404 for feed. Practically all the corn produced is fed to work stock.

There usually are two general plantings of corn, an early and a late crop. The early planting usually is made in March and matures in late summer, at which time it frequently is harvested for feed. The late corn is planted the latter part of April.

Little attention is given to the selection of good seed and varieties of corn adapted to local conditions. Of white varieties, the Johnson County White, Mosbys Prolific, Hastings Prolific, Iowa Silver Mine, and Mexican June are the most commonly grown, where any effort is made to use improved strains. Reids Yellow Dent and Fergusons Yellow Dent are the principal yellow varieties.

The average yield of corn in the last four census years has not exceeded 23 bushels per acre. Yields as high as 60 to 75 bushels per acre are, however, occasionally obtained. The corn weevil does some damage to the crop.

The seed bed for corn frequently is put into only a fair condition of tilth, the interest and effort of the farmer or tenant being centered on cotton, preparation for which is ordinarily more thorough. Usually corn is harvested by snapping the ears, leaving the stalks in the field to be winter pastured, a practice under which the heavy, clayey soils frequently are puddled and impaired physically. The cultural methods used for corn are very similar to those used for cotton. In many cases cowpeas are drilled in the rows at the last cultivation.

Some attention has been given to ensilage corn in the last few years. Most of the silos have been constructed in the uplands. There are about 30 silos in the county.

Wheat is not an important crop in Jefferson County. As varieties best suited to local conditions the Arkansas Agricultural Experiment Station recommends the Alabama Bluestem, Red May, Fulcaster, and Fultz. The greatest enemy of wheat is rust.

The oat crop has never been of very great importance, although it is receiving increasing attention. Oats for feed are purchased to a considerable extent from outside points, as much as 70 cents a bushel being paid. According to the census, oats were grown in 1909 on 254 acres, with a harvest of 5,266 bushels. Individual yields of 70 bushels per acre have been obtained; on the other hand, many complete failures are reported. Poor yields are due largely to inadequate drainage and lack of proper cultivation. Both winter and spring oats are grown, the former being the most successful.

The Turf and Texas Rustproof are the best varieties, the Turf oats being popular on well-drained soils where the danger of damage by rust is not so great as on poorly drained soils.

Cowpeas have been grown more or less extensively for several years, generally producing good yields, ranging from 1 to 2 tons of hay per acre. The cowpea has proved a valuable legume for the region, not only as a forage crop but as a soil improver, although from the standpoint of soil improvement the results have been variable, owing to the prevailing practice of cutting the crop for hay, in which case much of the manuring value is lost. This legume has been found almost as effective as red clover in increasing soil productiveness, and it succeeds on a much wider range of soils. It is especially valuable in improving the structure of the heavy soils popularly referred to as "buckshot land," including the Portland silty clay loam, Portland clay, and Miller clay.

Soy beans are not grown extensively, but it is believed that with increased attention to live stock this crop will increase in favor. In general, soils that have grown corn successfully give good results with soy beans. The crop seems to do better on poorly drained soils than cowpeas, and also to withstand dry weather better. It may be sowed any time after danger from frosts is past, from early spring until midsummer. Soy beans can be grown in many systems of crop rotation, and in other sections the seed brings sufficient profit to warrant making the legume one of the main crops in the rotation.

According to the census of 1910, rice was grown on 41 acres, with a production of 3,660 bushels. This cereal has met with great success in the last few years in Arkansas and adjoining counties. The Lufkin silt loam is used successfully for rice in southwestern Arkansas. Much of the upland of the county, in fact most of the upland soils, including the Caddo silt loam and very fine sandy loam and the Lufkin silt loam, are much like the principal rice soils of central Arkansas and those in the vicinity of Crowley, La., where the crop has proved highly successful. Rice has succeeded on the Portland clay, an important soil type in Jefferson County, yields of 90 bushels per acre having been obtained.

The census reports 4,206 tons of hay cut in 1909. This was divided almost equally among tame grasses, wild grasses, and grains cut green. Of the 898 acres in tame grasses, clover occupied 49.

Alfalfa is receiving increasing attention on the river-bottom soils, though as yet the acreage is small. The census reports 146 acres in alfalfa in 1909, producing 354 tons. This legume does well, especially on the heavier types, even without liming or inoculation. The upland soils do not seem to be adapted to this crop.

Lespedeza, or Japan clover, is an important hay crop. It spreads over abandoned fields in a short time and grows wild along the

roads. On the bottoms along the upland streams it makes a luxuriant growth and yields over 2 tons of hay an acre. It is a very nutritious feed. When it is to be sowed in the spring best results are had with a nurse crop, such as oats. Usually two cuttings are made, one in September and a second in October. Lespedeza probably will succeed on all the soils of the county.

Bur clover is of no importance in the agriculture of the county. It is grown extensively for winter pasture in other counties having somewhat similar soils. This crop succeeds on a wide variety of soils and is easily started.

Increasing attention is being given to the vetches, although as yet these legumes are of little importance. In value as a cover crop and for hay and pasture the vetches are comparable with the clovers. They succeed on any well-drained soil, and do particularly well on the sandy types.

With the development of the live-stock industries, permanent pastures become more necessary. Of the grasses suitable for hay and pasturage the most important is Bermuda grass. This grass seems to be the best available for summer pasture. It is very tenacious, withstands long droughts and wet conditions well, is not hurt by the trampling of live stock, and furnishes nutritious hay and pasturage. Many farmers are reluctant to introduce Bermuda grass because they fear it can not be eradicated when the field is to be used for cultivated crops, but it can be killed out by sowing oats and vetch in the fall and following with cowpeas the next summer.

Johnson grass is becoming a pest in some parts of the county. "Coco" grass, or nut grass, is encountered in some fields, and is difficult to eradicate. It is said that this grass is spreading on some of the river-bottom soils. Broom sedge grows naturally in clearings in both bottom and upland soils. Different varieties of water-loving grasses growing in the low, moist situations furnish excellent pasturage.

The production of Irish potatoes for market has been taken up by a few farmers. This crop is reported by the census of 1910 on 174 acres, with a production of 13,829 bushels. Irish potatoes are planted late in February or early in March, and are ready for market in June. Success with this crop apparently depends largely upon market conditions. The sandy soils of wide development are well suited to the production of potatoes. The average yield is approximately 80 bushels per acre. In July the potato land may be replanted to sweet potatoes, corn or cowpeas, or to another crop of Irish potatoes. The potato crop has proved profitable, and the soil and climatic conditions favor the extension of potato growing as well as of trucking in general.

Practically all the farmers grow sweet potatoes for home use, but few grow the crop on a commercial scale. The census reports 23,988 bushels produced in 1909 on 243 acres. Yields range from about 100 to 200 bushels per acre. The sandy soils of both the uplands and bottoms are well suited to this crop, and its production apparently could be profitably extended.

According to the census, peanuts were grown on 58 acres in 1909, producing 1,621 bushels. This legume has proved valuable in other counties as feed for hogs, the animals being allowed to forage for the nuts. They fatten on this feed, and when finished on corn the meat is of high quality.

Fruit is not grown on a commercial scale, although a small surplus is sold on the local markets. The 1910 census reports a total of 2,810 apple trees and 8,747 peach trees in the county. Peaches do well on the well-drained upland soils, particularly on the Ruston types. Pears suffer severely from blight. Pecans are grown successfully in one grove. Blackberries and strawberries, although not grown extensively, are well suited to local conditions. Strawberries are reported on 20 acres in 1909, with a production of 52,715 quarts. There is a good home market for all these products.

The animal industries have never been important in the agriculture of the county, although the temperate climate and the abundance of nutritious grasses and forage crops available make conditions favorable to a high degree. The prevalence of the Texas fever tick has tended to restrict the raising of cattle in larger numbers, as well as the improvement of the grade, but this enemy is being combated. According to the census of 1910, the value of live stock sold and slaughtered in 1909 was \$110,167. The value of dairy products, excluding home use, is given as \$81,413, and the value of poultry and eggs as \$75,902. Totals of 384 calves and 2,512 other cattle, 5,445 hogs, and 405 sheep and goats are reported sold or slaughtered, and 161 horses and mules are reported sold.

The live stock of the county, especially the cattle, is generally inferior. The better dairy animals are grades, mainly of Jersey blood. There are no dairy herds composed entirely of purebred cows, although there are some purebred bulls in the county, and some herds contain a few purebred cows. As far as ascertained, there is but one purebred herd of beef cattle, these being of Hereford blood. Feeding animals for market is receiving some attention, and is considered profitable.

There are no creameries in the county. On about 25 farms dairying is the principal interest. Weight records of the milk production of individual cows are kept by some farmers, but none test the cows for butter-fat production. Although the local demand for milk and butter usually is supplied by the dairies of the county,

no effort is made to supply outside markets. Improvement in the breeding of dairy cows and the more extensive production of feed at home are necessary for the extension of the dairy industry.

The hogs are usually of better quality than the cattle, most of them being of good grade. Berkshire and Duroc Jersey blood predominates, with Poland China and Tamworth of less prominence.

The horses and mules in the county are ordinarily small, though on some of the larger plantations mules of good quality and size are used. The mules are mainly imported from more northern States. Several jacks have recently been imported from Illinois, and an effort is being made to raise in the county a greater proportion of the mules used.

The use of commercial fertilizers is increasing. The census reports a total expenditure of \$9,265 for fertilizer in 1909. An ordinary application is 200 pounds per acre of a mixture containing 8 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash. For truck crops applications of 800 pounds per acre are made. Fertilizers are more generally used on the upland than on the bottom-land soils.

Systematic crop rotations are not followed. Good results are reported by farmers sowing legumes between the rows of cotton and corn or in rotation with these staple crops. There are many good crop successions applicable to the soil and economic conditions of the region.

According to the 1910 census only 17.6 per cent of the farms of the county are operated by the owners. Most of the land is farmed by tenants, and their methods differ little from those that have prevailed for many years. Shallow plowing is given the light and heavy soils alike and practically all crops are planted on ridges.

Most of the tenants farm on the share system. It is customary for the planters to furnish the farm equipment and in some cases the work stock necessary to carry on the farm operations. If the owner furnishes teams, seed, and tools, he usually receives one-half of all the crops. If the tenant furnishes the equipment the owner usually receives one-third of the corn and one-fourth of the cotton. The cost of fertilizer is borne in proportion to the share of the crops each receives. The proportion of farms operated by owners is much greater in the upland than on the bottom lands, to which the larger plantations are mainly confined.

The average size of farms is reported by the census of 1910 as 49.9 acres. This does not indicate the size of land holdings, as in the census each tenancy is classed as a farm. Many of the plantations have as many as 25 or 30 tenants. Some of the largest holdings contain from 10,000 to 20,000 acres, and what is said to be

the largest cotton plantation in the world is located in the bottom lands of Jefferson County. It comprises over 20,000 acres. On this plantation Italian families have been introduced as tenants.

Of the farm land of the county, 54.2 per cent is reported as improved. The average value of farm land is given as \$25.08 per acre. The value of the bottom-land soils ranges from \$25 to \$75 an acre, depending upon the improvements, drainage, and location. Much of the upland can be bought for \$12 to \$18 an acre, although a few sales have been made at \$30 to \$45 an acre, the values depending mainly upon location. A few large tracts of land are held by companies and individuals for speculation. A large part of the bottom land is not for sale.

It is estimated that about 95 per cent of the laborers employed on the farms are negroes. Farm labor is employed mainly on the bottom-land farms. Wages range from \$10 to \$18 or \$20 a month, with board and lodging. Day wages range from 50 cents to \$1.25, with board. At present labor is abundant. An expenditure of \$239,530 for labor is reported in the 1910 census.

The agricultural conditions in Jefferson County are somewhat unsettled. The advent of the boll weevil has discouraged the planters. Although the growing of such crops as small fruits and vegetables offers good opportunities, the principal need apparently is the growing of more grain, hay, and other roughage, with the raising of more and better live stock. Through such a change in the general agriculture of the county, the land can be made to produce much heavier yields of cotton, the money crop, than under the present system. In addition, a large part of the present expenditure could be saved by producing food supplies for the home and feed for stock within the county.

#### SOILS.

The soils of Jefferson County are derived from water-laid material. Those of the bottom lands, which comprise about two-thirds of the county, are derived from stream alluvium, and those of the uplands from much older water-laid deposits, believed to be marine sediments.

The alluvium represents recently deposited material consisting of wash from the various soils of the drainage basins of the streams. That of the Arkansas River bottoms contains enough material brought down from the Red Beds region of western Oklahoma to give it a peculiar chocolate-reddish to pinkish color, especially in the subsoil. Also this material has made some of the bottom soils calcareous. There is present, of course, wash from regions other than the Red Beds; it is safe to assume that all the soils occurring along the Arkansas and its tributaries have contributed material to these alluvial soils, but it is the Red Beds wash that gives them their

dominant characteristics. Along the smaller streams of the county, those flowing through the local uplands, there is no Red Beds material, except in their lower courses where water has backed up from the Arkansas overflows. Along such streams the alluvial material has been washed from the upland soils, being derived from what is considered marine or Coastal Plain material. Since deposition there has been some change in the character of the material. Poor drainage, for example, has caused it to assume grayish and mottled colors in depressions and flats, unlike the surrounding material, which is mainly brownish, reddish or yellowish.

The origin of the material of the upland is not so clear as that of the bottom soils. It is not definitely known whether all of it represents material laid down in the sea and subsequently uplifted or whether much of it represents an old terrace of fluvial nature. The sandy and gravelly material, chert and quartz, possibly came from the Ozark region, but the source of the predominant silt is not known. Changes apparently have taken place here as well as in the bottoms since the deposition of the material. The more poorly drained flats and depressions are grayish and mottled, while the better drained soils show reddish or uniformly yellowish colors in the subsoils, representing the effect of better oxidation.

The material of the stream bottoms consists largely of silt, clay, and very fine sand, while that of the uplands is mainly silt and clay, with local and relatively small areas of a sandy or gravelly nature. The topography has not played a very important part in the matter of effecting soil differences, except as between well-drained and poorly drained soils. A greater proportion of the upland probably has poor drainage than of the bottom land. The slight ridges or swales and gently rolling or undulating areas show the effect of position and topography in the advanced oxidation resulting from the better drainage.

Twenty-two distinct soil types are mapped in Jefferson County. A number of these types are subject to some variation, and three are unimportant, being included with other types and indicated on the map by inclusion symbols. The soils of the county are classed with ten series, on the basis of similarity in color, origin, and topography. The types within a series are separated on the basis of texture and structure of soil and subsoil.

The soils of the Caddo series are grayish and the subsoils are mottled gray and yellow or gray, yellow, and red, and of rather stiff structure, especially in the lower part. Low, dome-shaped sandy mounds occur, being so plentiful in places as to give a decidedly hummocky surface. These soils are derived from sedimentary material representing, it is believed, Coastal Plain deposits. Three

types of this series—the Caddo sandy loam, very fine sandy loam, and silt loam—are recognized.

The soils of the Ruston series are gray to grayish brown, while the subsoils are reddish yellow, yellowish red or dull red and moderately friable. This series is intermediate between the Orangeburg and Norfolk soils in the color of the subsoil and between the Orangeburg and Norfolk on the one hand and the Susquehanna on the other in point of subsoil structure. Occasionally the lower subsoils are mottled with gray and shades of yellow. The soils ordinarily are closely associated in occurrence with the Orangeburg and Susquehanna. They probably are derived from practically the same formation as the Orangeburg; that is, from sedimentary material of the Coastal Plain. Two types of this series—the Ruston fine sandy loam and very fine sandy loam—are mapped.

Three members of the Susquehanna series are recognized—the fine sandy loam, very fine sandy loam, and clay loam. These soils are gray to reddish, and are underlain by mottled red and gray or red, gray, and yellow, plastic, heavy clay subsoils. Red is nearly always the predominating color in the subsoil, the other colors appearing only as mottlings in the lower part of the soil section. The material is derived from heavy clay beds of the Coastal Plain deposits.

One member of the Lufkin series is encountered—the silt loam. In this series the surface soils typically are light gray. The subsoils are gray to mottled gray and yellow and plastic. The topography is pre-vaillingly flat, and this, together with the impervious subsoils, renders surface drainage and underdrainage poor, water often standing for long periods after heavy rains. The material is derived from clay beds of the Coastal Plain deposits.

The Portland series is characterized by the brown color of the surface soils and by the salmon-red or light pinkish red to mottled grayish, reddish, and brownish color of the subsoils. It includes five types in this county—the very fine sand, very fine sandy loam, silt loam, silty clay loam, and clay. The material is alluvial in origin, and contains some reddish material from the Red Beds region. A large part of the material is derived from other sources, but there is enough of the red material to give the subsoil a distinctive color.

The Ochlockonee soils are dark gray to brownish, with brownish or mottled brownish, yellowish, and gray subsoils. This series includes the darker colored soils of the first bottoms along the Coastal Plain streams. The soils are composed principally of wash from the Coastal Plain soils. The series is represented in the county by two types—the Ochlockonee very fine sandy loam and silt loam.

The Yahola series is represented in this county by a single member—the Yahola clay. Typically the Yahola soils are characterized by the chocolate-red color of the surface material and the lighter color

and lighter texture of the subsoils. They occur in overflowed stream bottoms. The reddish color of the material is due to the presence of sediments from the Permian Red Beds region. The Yahola soils differ from the Miller in having lighter colored and lighter textured subsoils.

The Miller series includes soils of chocolate-brown or dark chocolate red color, with chocolate-red or pinkish-red subsoils. Both soil and subsoil are calcareous. Some of the sandier members are grayish brown in the surface section. The soils of this series are developed in the first, or overflow, bottoms of streams flowing from the Permian Red Beds region. The Miller fine sand, very fine sandy loam, and clay are encountered in this county.

The following table gives the name and the actual and relative extent of each soil type mapped in Jefferson County:

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Portland clay.....	93,184	17.8	Ochlockonee very fine sandy loam.....	12,480	2.2
Well-drained phase.....	7,104		Susquehanna very fine sandy loam.....	10,112	1.8
Portland very fine sandy loam.....	75,200	16.9	Susquehanna clay loam <sup>2</sup> .....		
Poorly drained phase.....	19,712		Miller fine sand.....	8,768	1.6
Caddo silt loam.....	76,864	13.7	Ochlockonee silt loam.....	7,232	1.3
Miller clay.....	53,376	9.5	Bibb silt loam <sup>3</sup> .....		
Caddo very fine sandy loam..	35,136	6.2	Ruston very fine sandy loam..	4,928	.9
Norfolk very fine sandy loam <sup>1</sup>			Lufkin silt loam.....	3,712	.7
Portland silt loam.....	34,304	6.1	Miller very fine sandy loam..	2,688	.5
Portland silty clay loam....	30,464	5.4	Caddo sandy loam.....	1,088	.2
Ruston fine sandy loam.....	29,056	5.2			
Portland very fine sand.....	20,352	3.6			
Yahola clay.....	20,288	3.6			
Susquehanna fine sandy loam.	15,872	2.8	Total.....	561,920	

<sup>1</sup> Area included with the Caddo very fine sandy loam.

<sup>2</sup> Area included with the Susquehanna very fine sandy loam.

<sup>3</sup> Area included with the Ochlockonee silt loam.

CADDO SANDY LOAM.

The Caddo sandy loam is a grayish or yellowish sandy loam to heavy sandy loam, passing at about 5 or 6 inches into a yellowish sandy clay loam or heavy sandy loam, usually mottled with gray. This in turn grades into a mottled yellow and gray sandy clay. Some small chert and quartz gravel is frequently present throughout the soil section. In places the sandy loam layer continues to a depth of 25 inches. Sandy mounds with better drainage and having a more uniformly yellow or reddish subsoil than typical also occur.

Gravelly areas, representing included areas of Caddo gravelly sandy loam, are shown on the map with gravel symbols. These

gravelly areas are not very extensive. They are confined to the southern part of the county. The chief difference from the typical soil is the presence of as much as 20 or 30 per cent of rounded gravel of chert and quartz. The quantity of gravel is greater in the soil than in the subsoil.

The Caddo sandy loam occurs in the southern part of the county near the county line. This type covers only 1.7 square miles. Owing to its small extent, it is of little importance in the county. The surface of this type is usually somewhat sloping to gently undulating.

On account of the extremely porous nature of the soil, crops suffer from continued dry weather, and fertilizers readily leach out in the drainage waters during wet seasons, unless the soil is liberally supplied with organic matter. Such crops as cowpeas, vetch, oats, rye, and soy beans plowed under improve this unfavorable structure.

The forest growth consists mainly of different varieties of oak, with a few pine. Most of the merchantable timber has been removed. The soil appears to be well suited to small fruits and vegetables. About 30 per cent of the type is in cultivation. Cotton and corn do fairly well under careful management. This soil is held in connection with adjoining types.

#### CADDO SILT LOAM.

The typical Caddo silt loam consists of a grayish or pale-yellowish, friable silt loam which passes at a depth of an inch or so into a yellow or mottled yellow and gray silt loam, underlain at about 12 to 15 inches by a mottled yellow and gray, heavy silt loam to silty clay loam, the latter occurring at about 20 inches. Occasionally at a depth of about 30 inches a compact layer of mottled gray and yellow or drab and yellow, rather impervious silty clay loam to silty clay is encountered. The surface soil contains a noticeable quantity of fine or very fine sand, which is conspicuous on account of the low organic-matter content of the soil. Where the drainage is better, as near slopes, the gray color does not appear, except in the lower subsoil, the subsurface soil and upper subsoil being more uniformly yellow.

Along Bayou Bartholomew, in the southern part of the county, the soil approaches a silty clay loam, consisting of a yellowish to yellowish-brown, heavy silt loam, with some faint rusty-brown mottlings, in places. This grades at about 5 inches into a yellow silty clay loam mottled with gray, and this into yellow silty clay mottled with gray.

The Caddo silt loam is the most extensive and important of the upland soils. It covers 13.7 per cent of the county. Large areas of the type are still in the virgin state, though most of the merchantable timber has been removed. The original forest growth consisted

mainly of shortleaf pine, several varieties of oak, and sweet gum. The heavy variation of the type along Bayou Bartholomew is forested almost entirely with white, post, and black oak, with some sweet gum and pine.

The surface of the type for the most part is practically level, but there are scattered dome-shaped mounds of brownish to yellowish very fine sandy loam to silt loam, underlain by yellow or reddish-yellow, friable clay. Many of these mounds represent areas of the Ruston very fine sandy loam which can not be mapped separately, on account of their small size.

The most extensive farming on this type is near the main roads, a few of which are maintained in first-class condition. Some of the farms are equipped with modern buildings, but others are not well improved. The agriculture consists of cotton production, with the other crops holding comparatively unimportant places. Not enough corn is grown by all farmers to supply their own needs. Cotton is the money crop.

As is true to a large extent of the other upland types of the county, this soil is in need of proper drainage, liming, and the addition of organic matter. Drainage is easily improved by the construction of open ditches, although tiling is necessary in some places. The type includes some very flat and depressed areas in which drainage is difficult, but such areas in the main are small, and are best used for pasture. Tests with litmus paper indicate that the soil is acid. This condition can be remedied by the application of lime, which can be obtained in many parts of the State in carload lots for about \$3 a ton. It should be applied at the rate of about 2 tons per acre of ground limestone or 1 ton of quicklime, as a first treatment. Further applications may be required for best results. Many farmers have succeeded in bringing this soil into a high state of productiveness by increasing the content of organic matter. Just as many, or more, on the other hand, are operating on an unprofitable basis by attempting to grow cotton and corn without regard to a rotation designed to increase the content of organic matter and the nitrogen supply.

Although cotton can be grown profitably on the type, continuous production of this crop on the same land necessarily results in decreased yields. One-fourth to one-half bale per acre is the ordinary range of yields under existing conditions. These yields can be increased by growing leguminous crops and increasing the supply of organic matter in the soil, as evidenced by the results attained by the better farmers.

Land of this type can be bought for \$12 to \$30 an acre, depending on location and improvements.

Little is being done on this soil in the matter of live-stock production or dairying, but it is probable that these industries could be

successful. Bermuda grass and lespedeza grow wild on the type, and there are good permanent pastures. Lespedeza has a high feeding value. Cowpeas, soy beans, vetch, bur clover, and oats are among the other crops to which the soil has proved to be suited. Soils similar to this are successfully used for rice in various parts of Texas and Arkansas.

#### CADDO VERY FINE SANDY LOAM.

The soil of the Caddo very fine sandy loam is a grayish to grayish-brown very fine sandy loam, passing at 2 or 3 inches into a pale-yellow very fine sandy loam; which in turn is underlain at about 12 to 15 inches by a yellow, moderately friable sandy clay to silty clay mottled with gray. This becomes somewhat heavier in the lower part of the 3-foot section. In places the lower subsurface material and subsoil are predominantly a grayish sandy clay mottled with yellow and less frequently with red. A very compact layer of gray silty clay may be encountered in the lower part of the soil section. Such areas are of irregular occurrence and are not so common as in the Caddo silt loam.

The Caddo very fine sandy loam, like the silt loam, is poorly drained, and litmus-paper tests show an acid condition. The surface is prevailingly flat, although some areas have a gently undulating topography. Mounds or hummocks consisting of Ruston very fine sandy loam occur within this type.

This type is most extensively developed in the northwestern part of the county around Kearney and Jefferson. Smaller areas are found in the western and southwestern sections. It is estimated that about 20 per cent of the type is in cultivation. Cotton is the principal crop. Yields of one-fourth to one-half bale per acre are obtained. Corn is grown for home use, yielding about 20 to 25 bushels. Other crops are of little importance.

The type is easily cultivated. Areas of poor drainage are easily drained by open ditches. Native grasses, including Bermuda grass, grow luxuriantly and afford good grazing.

In general this type is very similar in crop adaptation to the silt loam of the series. Its lighter texture makes it somewhat warmer and consequently earlier. On the other hand, its power to retain moisture and plant food is not so great as that of the silt loam. Three important features must be considered in its improvement—its imperfect drainage, its acid condition, and its low organic-matter content.

Land of this type sells for \$15 to \$25 an acre. Opportunities for settlers on this type, as well as on the silt loam of the series, are very good under constructive systems of management.

## NORFOLK VERY FINE SANDY LOAM.

With inclusion symbols several small areas of Norfolk very fine sandy loam are shown within the Caddo very fine sandy loam.

The surface soil of the Norfolk very fine sandy loam is a grayish very fine sandy loam which grades quickly into a heavier, pale-yellow very fine sandy loam, and this at about 10 to 15 inches into a yellow, friable clay without the grayish mottling characteristic of the Caddo subsoil. Some chert and quartz gravel are commonly present.

This soil is encountered on stream slopes. In some places it occurs in association with the Ruston soils.

Most of the Norfolk soil is in cultivation. It originally was forested with pine, oak, and gum. The soil is well suited to all the crops grown in the county. It is easily cultivated and responds readily to good treatment. It is particularly well suited to strawberries, fruits, and vegetables, and is used extensively for the production of these commodities in other parts of the South. Owing to the character of the subsoil, crops growing on this type have a decided advantage over those on the Susquehanna soils, provided the sub-drainage is good.

## RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam typically consists of a grayish-brown fine sandy loam to 5 or 6 inches, below which yellowish or slightly reddish, heavy fine sandy loam is encountered. The subsoil occurs at about 15 inches. It is a reddish-yellow sandy clay loam, grading quickly into a dull-red, friable sandy clay, which continues without important change to 36 inches or more. Gravel is present in local areas. A few patches near the border of the type grade through a dull-red clay in the subsoil into a yellowish clay mottled with gray and drab, being very similar to the Caddo subsoil in color characteristics. Slight variations in the color of the subsoil are believed to be due to differences in degree of oxidation of the soil material, the better drained and aerated soils having a deeper red color.

There are a number of small gravelly areas, the most important of which are shown with gravel symbols. The principal departure of the soil of these areas from the typical fine sandy loam is the presence of quartz and chert gravel in sufficient quantity to give the soil a decidedly gravelly nature. These areas are rolling and well drained.

The Ruston fine sandy loam is most extensively developed in the northwestern and southwestern parts of the county. Most of it is found on stream slopes and divides. Small areas of a rolling topography are found. The soil here is inclined to wash and should be planted to winter cover crops. The drainage is good. The soil is

easily cultivated, on account of its sandy nature, yet the subsurface material and subsoil are heavy enough to absorb and hold a good supply of moisture. Cotton and corn are the main crops, and good yields are obtained with heavy fertilization. Deeper plowing is needed in order to mix some of the subsurface sandy clay material with the surface soil, so as to increase its absorptive power.

This type originally supported a heavy growth of shortleaf pine and different varieties of oak. Practically all of it is in cultivation. It is held in high esteem by farmers and usually increases the value of adjoining soils, with which it is generally sold. The gravelly areas are not so easily cultivated, but they are mostly under cultivation and give about the same yields as the typical fine sandy loam, being used for the same crops.

The Ruston fine sandy loam is used extensively in other parts of the South for the production of peanuts for hogs, the animals being allowed to forage the crop. This practice is not only profitable commercially, but also increases the productiveness of the soil for other crops.

#### RUSTON VERY FINE SANDY LOAM.

The surface 3 or 4 inches of the Ruston very fine sandy loam type is a grayish to grayish-brown very fine sandy loam. Beneath this occurs a yellowish, heavy very fine sandy loam, which extends to a depth of about 10 inches, where it grades into a yellowish sandy clay loam. This extends to a depth of 15 to 18 inches, passing into a dull-red to yellowish-red, moderately friable clay. In places near the boundary of the Caddo soils the subsoil of the Ruston very fine sandy loam below 30 inches frequently grades into a reddish-yellow silty clay loam mottled with gray or drab. The type occurs on the gentle slopes along small streams of the upland, and is usually well drained. It is easily cultivated, and was the first of the upland soils to be cleared for cultivation, owing to its good natural drainage and relatively high productiveness. Practically all of the type is now in cultivation, cotton being the leading crop, with corn next in importance. Yields and quality of vegetables grown for home consumption indicate that the soil is well suited to truck growing. Cotton has been known to produce three-fourths bale per acre on the best land of this type, but yields of more than one-half bale per acre are rare under present conditions.

This type, like the Ruston fine sandy loam, is particularly suited to small fruits and certain tree fruits. Peaches and plums do well, and are grown to a small extent. No effort is made to control insect pests and fungus diseases.

This soil is one of the strongest of the upland types, and is still producing good yields of cotton, corn, and oats. Continuous produc-

tion of these clean-culture crops will ultimately cause a deterioration of the soil, unless methods designed to maintain the supply of organic matter are adopted. The incorporation of organic matter, among other benefits, improves the water-holding power of the soil.

Probably no soil in the county offers better opportunities for the profitable production of a wide variety of crops than this one, though it is of less economic importance than some of the other soils, on account of its small extent. No value can be given for this type separately, as it is usually sold with adjoining soils.

#### SUSQUEHANNA FINE SANDY LOAM.

Typically, the Susquehanna fine sandy loam is a grayish fine sandy loam, underlain at about 6 inches by a yellowish or yellowish-red fine sandy loam. At about 12 inches a dull-red, heavy, plastic clay mottled with gray or drab is encountered. In places the subsoil is a dull-red, plastic clay to about 30 inches, mottled with gray in the lower part of the 3-foot section; in other areas gray or drab is the dominant color of the subsoil, with red appearing as mottlings. Litmus-paper tests indicate that the soil is acid.

Several small gravelly areas (Susquehanna gravelly sandy loam) are shown by gravel symbols. This soil differs from the typical fine sandy loam in the presence of enough small, rounded gravel to give it a decidedly gravelly nature. The gravel is much less abundant in the subsoil than in the soil.

The Susquehanna fine sandy loam occurs principally in the western part of the county. It is not extensive and is of little importance in the agriculture of the county. Where cultivated it is used mainly for cotton, giving fair results. Some of the gravelly areas are used for the same purpose and the yields on the two soils are about the same.

The cultural methods employed on this type are similar to those prevailing throughout the county, including shallow plowing and ridge cultivation. Commercial fertilizers are used at the rate of about 200 pounds per acre. They are reported to have a more lasting effect than on soil types of the Caddo series.

#### SUSQUEHANNA VERY FINE SANDY LOAM.

The surface soil of the Susquehanna very fine sandy loam closely resembles that of the very fine sandy loam soil of the Ruston series. Typically, the surface 5 or 6 inches is a grayish very fine sandy loam. This is underlain by a yellowish fine sandy loam, which at about 8 to 12 inches passes into a mottled red and gray or drab, heavy, plastic clay, the gray or drab becoming more prominent with increase in depth. In places clay is encountered near the surface, and in others

it is relatively deep. There are places where the upper subsoil is red, with drab mottling in the lower part only, while in other places drab is the most conspicuous color throughout the subsoil.

The Susquehanna very fine sandy loam is most extensively developed in the southwestern part of the county. It occupies broad, level to nearly flat areas and gradual slopes to streams. Some of the smoother areas are poorly drained, but most of the type has good surface drainage. The forest growth consists mainly of oak and pine.

It is estimated that about 20 per cent of the type is in cultivation. Cotton and corn are grown most extensively, yields of about one-fourth bale of cotton or 20 bushels of corn per acre being obtained. Where heavily fertilized the yields are materially larger.

The soil quickly deteriorates under the prevailing one-crop system. This is due in part to the diminution of the organic-matter content, the supply of this constituent being very low in this soil, even in its virgin state. A lowering of the organic-matter content decreases the water-holding power of the soil, a factor which is of great importance on this type, inasmuch as moisture does not circulate freely through the heavy, plastic clay subsoil.

Land of this type can be bought for \$12 to \$30 an acre, according to location and improvements.

For the successful production of crops this type requires deep preliminary plowing, followed by frequent shallow cultivation during the growing season to conserve moisture, and the incorporation of organic matter, which increases the power to retain moisture. The physical condition of this soil can be materially improved by growing deep-rooted crops, such as cowpeas and soy beans, to loosen the subsurface material and add organic matter. In many places deep plowing will improve the texture by mixing some of the heavy subsoil material with the soil. The soil is acid and in need of lime. This should be added and leguminous crops, such as cowpeas, soy beans, vetch, and lespedeza grown and turned under, or fed to live stock and the manure returned to the fields. This would effect an important saving in the expenditure for nitrogenous fertilizers.

#### SUSQUEHANNA CLAY LOAM.

A few small areas of Susquehanna clay loam are shown on the map with inclusion symbol in Susquehanna very fine sandy loam color. The Susquehanna clay loam consists of 8 or 10 inches of a yellowish-brown clay loam to silty clay loam, underlain by mottled red and gray, heavy, plastic clay. In places a stratum of yellowish clay overlies the mottled clay, in which case the heavy, plastic stratum is not encountered above a depth of about 15 inches. In places some small gravel is present on the surface.

Areas of this soil occur about 7 miles south of Pine Bluff in sections 19, 20, and 29, township 7 south, range 9 west. The soil occupies smooth areas and drainage is generally deficient. The forest growth consists mainly of post oak, white oak, and shellbark hickory. Most of the original growth has been cut. Only very small areas are in cultivation.

This soil is considered less desirable agriculturally than the sandy areas, owing to the difficulty of tilling it. It is valuable as pasture in its present condition, and when carefully managed will probably be found fairly productive, but the range of conditions under which cultivation is possible is comparatively narrow. Its best use probably is for pasture, although oats and hay can be grown successfully.

#### LUFKIN SILT LOAM.

The surface soil of the Lufkin silt loam is a gray silt loam, somewhat mottled with yellowish or rusty brown. This passes at about 10 to 15 inches into gray or drab silty clay loam to silty clay, generally mottled with yellow and having a rather plastic structure. A compact layer, consisting of mottled drab and yellow silty clay loam or silty clay, occurs at about 24 to 30 inches. This layer is impervious and is partly responsible for the imperfect drainage of the type, although the poor drainage is due in some degree to the level or slightly depressed surface. Often this lower stratum is much dryer than that overlying it, the grayish material usually having a dry, powdery character, even when the surface is covered with water. Black concretions or concretionary material are present in many places in the lower subsoil.

The soil in the mounds that occur in this type, as in the Caddo, is usually of a yellowish color, similar to that of the Norfolk soils, except that the lower stratum is mottled gray and yellow. A few of the mounds consist of Ruston very fine sandy loam, the color of the subsurface and subsoil being reddish yellow to dull red. The variations in color are due to differences in drainage conditions and aeration, resulting in more complete oxidation in places.

The Lufkin silt loam occurs in scattered areas throughout the upland region of the county, the largest single areas lying south of Pine Bluff.

The surface is level, with some faint depressions. The mounds are dome shaped and from 3 to 4 feet high and 30 to 35 feet in diameter, although these are less common than on the Caddo soils. During rainy seasons water stands over most of the surface.

Very little of the Lufkin silt loam is cultivated. It supports a good growth of pasture grasses and is devoted largely to grazing, most of it being open range land. Its value for grazing could be

greatly increased by clearing away some of the timber and underbrush, which frequently grows so thick as to smother the grasses. Most of the land is forested, chiefly with water oak, sweet gum, black gum, and pine.

Soil of this kind has been successfully used for rice in the southwestern part of the State, and much of the land of the rice section in the central part of the State is quite similar to this. Under present conditions the type seems best suited to grazing. The soil is pre-vaillingly acid, and if it is to be used for crop production, liming and the establishment of adequate drainage are necessary.

#### PORTLAND VERY FINE SAND.

The Portland very fine sand is a grayish-brown to brown very fine sand, underlain at about 12 to 15 inches by lighter colored to slightly pinkish very fine sand. The type contains areas with a billowy surface in which the soil of the depressions is a silt loam. Usually the surface soil, owing to its higher content of organic matter, is more loamy than the subsoil. Some included small bodies consist of Portland fine sand.

This type is found mainly along the Arkansas River, the largest developments occurring to the east of Pine Bluff. It covers 3.6 per cent of the total area of the county. The surface ranges from billowy to almost flat. The areas are well drained, and the type is subject to overflow only in case of extremely high waters.

The Portland very fine sand can be cultivated several days earlier after rains than the heavier types. It is a light, warm soil and is particularly well suited to the production of truck crops. Such crops, however, are not grown except for home consumption. Cotton and corn are the main crops grown, yields ranging from one-half to three-fourths bale of cotton and from 15 to 35 bushels of corn per acre. The yield of corn could be materially increased by the use of better seed corn and by better cultivation. Shallow plowing and cultivation are practiced and crops are grown on ridges.

Alfalfa does not do well on this type. The crop apparently suffers from lack of moisture in the summer. Cowpeas, soy beans, and vetch succeed, and could be used to advantage in rotations to build up the soil. Little commercial fertilizer has been used on this type.

#### PORTLAND VERY FINE SANDY LOAM.

The Portland very fine sandy loam is a light-brown to brown very fine sandy loam, grading through lighter colored or pinkish very fine sandy loam into light reddish brown to pinkish or salmon-colored, moderately friable to plastic silty clay, the latter beginning at depths ranging from about 18 to 20 inches. In the higher areas

the subsoil is more a chocolate red, and the surface soil is frequently deeper than typical. In places where the surface is billowy the soil varies from a very fine sandy loam on top of the ridges to silt loam or even silty clay loam in the depressions, such variations frequently occurring within a distance of a few feet. The chocolate cast in the reddish subsoil indicates that the material is derived at least in considerable part from the soils of the Permian Red Beds, the chocolate to salmon color being quite unlike the dull reds and brick reds of the uplands.

The soil occurs in well-drained, nearly level areas which lie from 3 or 4 to 10 or 12 feet above the lower bottoms of the Arkansas River and some of its tributaries. These soils, while occupying a relatively high position as compared with the bottom soils, occur in close association with the heavier soils, extending in places up to the banks of the Arkansas River. The type is said to be subject to inundation in times of very high floods. With the exception of a small area of about 640 acres on the outskirts of Pine Bluff, which seems to be several feet higher than any of the bottom land, it is protected by levees. The areas of this type are not considered high enough to be terrace soils proper, although they do occupy a very low terrace position, similar to that occupied by the better drained phases of Sharkey clay in the Mississippi River bottoms as compared with the typical Sharkey clay. The surface color is darker brown and the subsoil more of a chocolate red than is the case with the Teller soils, mapped in other areas, which characteristically occur on old, high terraces.

The Portland very fine sandy loam is one of the most extensive and important soil types in the county. This type, the Portland very fine sand, the Portland silt loam, and the Yahola clay, are the highest and best drained soils of the bottoms.

The original forest growth consisted of pine, laurel, post oak, white oak, black oak, hickory, gum, elm, and pecan. Practically all the type is in cultivation. It was one of the first soils in the county to be cleared. It is easy to cultivate and can be tilled under a wide range of moisture conditions. It is very productive and is considered of slightly higher agricultural value than the Portland very fine sand, owing to its ability to withstand droughts.

Cotton and corn are the most important crops, cotton being grown on about 90 per cent of the area of the type. Until the season of 1915 no important attempts to grow forage crops were made, practically all the hay for work stock being shipped in. A few farmers are planting Irish potatoes this season (1915) in an attempt to obtain a crop to take the place of cotton, and as market facilities are good and vegetables of high quality can be grown it would seem that trucking could be successfully developed. The soil is well

s suited to such crops as Irish potatoes, sweet potatoes, peanuts, and garden vegetables of all kinds, but these crops are not grown except for home consumption.

Yields of corn rarely exceed 25 to 30 bushels an acre. Corn and cotton have been grown continuously on this type for the last 35 years, or since the land was cleared. It appears that yields are beginning to decrease, indicating need of a better system of farming, including deeper plowing and the practice of rotations providing for such crops as cowpeas, soy beans, and vetch. The soil is well suited to all these legumes, as well as lespedeza, and by a freer use of these the supply of organic matter could easily be increased. Only a few fields of oats were seen on this type during the survey, although the crop is well suited to this soil, and to the heavier Portland silt loam. The yields of all crops grown could be materially improved with better methods of farming.

Much of the bottom land, particularly the Portland very fine sandy loam and other sandy types of this series, is included in plantations of 500 to several thousand acres extent. The farming is done by negroes, to whom the land usually is rented on shares, the common method being to furnish the tenant with land, house, work stock, implements, and seed, the landlord taking a part of the cotton produced. The landowner also furnishes the renter with provisions on credit, waiting for payment until the crops are sold. In this county the tenant system apparently is not favorable to the practice of diversified agriculture or the extension of the live-stock industries.

Land of this type can be bought for \$35 to \$75 an acre, the price varying with the location and improvements.

*Portland very fine sandy loam, poorly drained phase.*—The poorly drained phase differs from the typical Portland very fine sandy loam chiefly in the lighter color of its surface soil and subsoil and in its more pronounced tendency to bake. The greater part of the phase is a grayish or light-brown very fine sandy loam to a depth of 12 to 15 inches, overlying mottled grayish, yellowish, and rusty-brown silty clay loam, which passes below into either yellowish or pinkish silty clay. Usually pinkish or salmon-colored material is reached between 30 and 40 inches. In places the subsoil is a light chocolate red silty clay with but little mottling, beginning at about 20 to 24 inches and becoming somewhat mottled with yellowish or drab and having a lighter shade of pink below. Small concretions are of common occurrence in the subsoil. The average texture of the surface soil is a little finer than that of the typical Portland very fine sandy loam, ranging close to a coarse silt in texture.

The poorly drained phase of the Portland very fine sandy loam is most extensively developed in the northeastern section of the county, particularly in the vicinity of Wabaseka, Gethsemane, and north

of Humphrey. A few areas are also found in the southern part, as along Bayou Bartholomew and south of Moscow. The phase lies a little lower than the typical soil, occurring usually between the very fine sandy loam type and the heavier soils of the series. The subsoil is imperfectly drained. It frequently remains saturated for long periods following wet seasons. The phase differs very little from the typical soil in its crop adaptation when adequately drained.

#### PORTLAND SILT LOAM.

The Portland silt loam consists of a brown to dark-brown, mellow silt loam which passes at about 10 to 15 inches into lighter brown or mottled yellowish and brownish silt loam, and this at about 20 to 24 inches into pinkish to yellowish very fine sandy loam to silty clay loam. In the lower situations the subsoil usually is mottled yellowish and brownish. Frequently the lower subsoil is a very fine sandy loam, varying from pinkish or salmon colored to mottled yellowish and pinkish.

This type includes small areas of a brown to reddish-brown silt loam underlain at about 20 inches by a chocolate-red silty clay loam, and this in turn by chocolate-red clay. These areas represent the Miller silt loam, but can not be mapped separately, on account of their small size. The largest areas of this character occur about 1½ miles south of Noble Lake. There are some dome-shaped mounds in places in which the soil is a brown silt loam to very fine sandy loam which extends to a depth of about 2 feet or more before the pinkish material is reached.

The Portland silt loam occurs in the Arkansas River bottoms. The surface is nearly level to slightly depressed. This soil generally is well drained, although in some places the drainage could be improved by ditching or tiling.

The Portland silt loam, although not so easily cultivated as the sand types of the series, is a mellow, friable soil, easily kept in good physical condition where provision is made for maintaining an adequate supply of organic matter. The soil is neutral to litmus paper.

Alfalfa does well on the type and could be made the basis of a profitable system of live-stock farming under which the present yields of cotton and corn could be greatly increased, as the soil would be improved by the growing of leguminous, nitrogen-gathering pasture crops and forage crops, as well as by the addition of manure. At present cotton is the principal crop.

Owing to its small extent and irregular occurrence, no definite value can be given for this type separately, but it is held in very high esteem by farmers and usually enhances the value of adjoining soils.

## PORTLAND SILTY CLAY LOAM.

The Portland silty clay loam consists of a brown silty clay loam, passing at 6 or 8 inches into lighter brown or mottled grayish, yellowish, and brownish silty clay, which is underlain at about 15 inches by pinkish or salmon-colored, plastic silty clay, frequently somewhat mottled with drab. In some places the soil is mottled from near the surface down, and the subsoil grades through a salmon-red into a chocolate-red clay at about 20 to 30 inches.

The Portland silty clay loam occurs in the bottoms of the Arkansas River and some of its tributaries. The type is locally called "buck-shot land."

Though most of the type is inadequately drained, about 50 per cent of it is in cultivation and is regarded as very productive. Cotton and corn are the principal crops. The soil has a greater tendency to bake and crust than the Portland silt loam. Frequently the type is plowed when covered with water. Usually the clods which subsequently form break up into small aggregates upon drying, so that a good seed bed can be prepared whenever rain falls at the proper time. The type is greatly improved by growing deep-rooted crops and plowing under green crops and manure. Where adequately drained the type in general will produce alfalfa successfully, especially where the chocolate-red subsoil lies near the surface. Areas subject to overflow, as along Bayou Bartholomew, and in which the water table lies within 3 or 4 feet of the surface, are not suitable for this crop. Great care is required in preparing the seed bed for alfalfa. Applications of ground limestone would probably make seeding more certain. Where alfalfa can not be grown such crops as cowpeas, lespedeza, and soy beans will be found good substitutes for it.

## PORTLAND CLAY.

The surface soil of the Portland clay is a dark-brown silty clay, frequently somewhat mottled with drab and yellow. This grades below into either pinkish to light chocolate red clay or first into mottled yellowish, reddish-yellow, and pinkish clay and then into pinkish or salmon-colored clay carrying some fine sand in the lower subsoil of some areas. In places the lower subsoil is chocolate red, much like the subsoil of the Miller clay. Some areas have a mottled drab and yellow clay subsoil.

This type occurs in the first bottoms of the Arkansas River and Bayou Bartholomew, the most extensive areas being encountered in the northeastern part of the county. It occupies low, flat situations, usually from 3 to 6 feet lower than the surrounding soils. It is protected from river floods by levees.

It is estimated that only about 5 per cent of the type is in cultivation. During rainy seasons water usually remains on the surface for long periods after rains, and it is due to this poorly drained condition that so little of the type is cultivated. Recently several large drainage canals have been constructed through areas of the type, and indications are that much of this soil will soon be utilized for agriculture. The construction of lateral ditches is necessary for the best results, and this work can easily be done by the individual property owners. When adequately drained the Portland clay will no doubt prove one of the strongest soils of the county, particularly for corn, oats, and grasses. Alfalfa should do well with adequate drainage. The type supports a good growth of grasses, and probably could be most profitably used for stock raising. The type includes large areas of fairly valuable timber, consisting mainly of red, white, black, and pin oak, hickory, gum, and elm.

Most of this land can be bought for \$25 to \$35 an acre in the unimproved state, but with main drainage canals completed.

Several low, swampy areas of the Portland clay are shown on the soil map with swamp symbols. These areas differ from the typical Portland clay in being more poorly drained and in having more generally a mottled surface soil. They are low and covered with water for a considerable part of the year, and some areas throughout the year. Cypress is a common growth on this phase, though not on the typical soil. Usually the surface soil of these swampy areas is a mottled drab and yellowish clay, and in places such material extends to a depth of 3 feet, but over, perhaps, the greater part of the areas the lower subsoil is a dark chocolate red or pinkish clay, frequently mottled with drab and yellow. These swampy areas are valuable only for the pasture they afford and for their timber growth.

*Portland clay, well-drained phase.*—The well-drained phase of the Portland clay consists of a dark-brown or chocolate-brown clay, the lower subsoil of which is usually mottled grayish and yellowish, with frequently some pinkish or salmon-colored material. The surface dries out to a dull-reddish cast. In places the lower subsoil is a chocolate clay with faint yellowish and drab mottlings. The subsoil is rather plastic.

This soil occurs in flat areas lying about 4 to 6 feet above the depressions in which the typical Portland clay or Miller clay types are developed. It is protected from overflow by levees. The largest single area is about 5½ miles east of Pine Bluff. Practically all of the phase is in cultivation. It is very productive and is devoted largely to cotton and corn. The production of forage crops, including alfalfa, could be profitably extended. Rice has been grown to

some extent, yields of 80 to 90 bushels per acre being obtained. The soil can be irrigated for rice culture.

#### OCHLOCKONEE VERY FINE SANDY LOAM.

The Ochlockonee very fine sandy loam is a brown very fine sandy loam, underlain by a lighter brown to yellowish-brown silt loam to silty clay loam. In places, particularly in poorly drained depressions, the lower subsoil is mottled yellow and gray. The type includes some isolated, low, narrow terraces, a typical area of this kind occurring about 2 miles south of Pine Bluff along Bayou Bartholomew. The soil here is a dark-brown very fine sandy loam, grading at about 15 inches into a yellowish-brown, heavy very fine sandy loam to silt loam. These areas very seldom overflow, whereas the typical soil is subject to periodic inundation.

The type is practically all in cultivation, and is used for the production of cotton, corn, and forage crops, all of which give very satisfactory yields. The soil on the higher terraces has a greater value, as it is less frequently overflowed.

#### OCHLOCKONEE SILT LOAM.

The Ochlockonee silt loam is a brown, mellow silt loam, underlain by a lighter brown to yellowish silty clay loam, which frequently grades into silty clay loam at about 30 inches. In the higher areas the texture usually is lighter, approaching a very fine sandy loam, while in the depressions the material is heavier, approaching silty clay loam.

The surface is prevailingly flat, with minor depressions. Much of the type is subject to overflow, which depreciates its value for farming. It is a very productive soil, and is well suited to corn, cotton, oats, and various forage crops, particularly lespedeza. Cotton and corn are the principal crops grown. Cotton yields from one-half to 1 bale per acre, and corn from 25 to 40 bushels. Practically no commercial fertilizers are used on the type. Where the land is overflowed occasionally nothing is needed but good soil preparation and tillage to produce good yields indefinitely. Practically all of the type is in cultivation. Originally it was forested with oak, hickory, elm, and gum. This soil usually is sold in conjunction with adjoining upland types.

#### BIBB SILT LOAM.

Several small areas of the Bibb silt loam are indicated by inclusion symbol in Ochlockonee silt loam color. The soil is a mottled brown, rusty-brown, and gray silt loam, which abruptly passes into a light-gray silty clay loam, frequently mottled with rusty brown. A light-

gray, compact silty clay loam or silty clay is encountered in the lower subsoil. This material commonly contains black concretions. The Bibb soil occurs in overflowed stream bottoms of the uplands. Its drainage is poor at all times. There are several strips along Derisau Creek in the southwestern corner of the county which occupy low terraces. These would possibly be overflowed at exceptionally high flood stages. They represent a minor development of the Myatt silt loam. The Bibb soil is not extensively developed. It is valuable only for pasture and for its forest growth. Lespedeza thrives on this soil.

#### YAHOLA CLAY.

The Yahola clay is prevailingly a chocolate-brown to dark chocolate red clay, grading at about 15 to 22 inches into pinkish or salmon-colored, friable fine sandy clay or very fine sandy loam, usually showing some mottling of reddish yellow. In some places the soil is a brown silty clay, grading at about 10 inches into a lighter brown silty clay. This passes into yellowish-red very fine sandy clay, underlain at about 20 inches by a very fine sandy loam or very fine sand of chocolate-reddish color.

This soil occupies relatively high positions in the bottoms, usually having about the same elevation as the Portland very fine sandy loam. It is well drained, and one of the most productive soils in the county.

Cotton and corn are the most important crops, although increasing attention is being given to alfalfa, a crop to which the type is well suited. Since the Yahola clay occurs mainly in narrow strips closely associated with other types, it is usually possible to devote all of this soil on the farm to alfalfa, using the other soils for the production of cotton, corn, and forage crops, and pasture. Many small patches of alfalfa on this soil are in a thrifty condition. Liming does not seem necessary on the areas of chocolate-red color, but inoculation is advisable. On the lighter brown soils, however, and in imperfectly drained areas liming would probably prove beneficial. Adequate drainage and good seed-bed preparation are necessary for the successful production of this crop.

#### MILLER FINE SAND.

The Miller fine sand consists of a fine sand to very fine loamy sand of a grayish-brown color, grading abruptly into a yellowish to reddish-yellow fine sand, which is underlain at about 20 inches by reddish to pinkish fine sand.

This type occurs along the banks of the Arkansas River. The material is being removed by the water in some places and additional material is being deposited in others.

The surface in general is level, but there are narrow ridges and hummocks of sand formed by the changing currents. The structure of the soil is quite open, and crops suffer from continued dry weather, owing to its low water-holding power. The soil is easily tilled, and produces heavy yields of corn and cotton in favorable seasons. Most of the type is subject to overflow, on account of which crops must frequently be replanted.

Bermuda grass thrives on the type. It affords good summer and fall grazing, and occasionally is cut for hay. White clover gives especially good pasturage on this type. Wild pecan trees suggest the possibility of growing the improved varieties of pecans on a commercial scale. The native forest growth consists mainly of cottonwood, willow, hickory, and maple.

The type is of small economic importance in the county on account of its limited extent.

#### MILLER VERY FINE SANDY LOAM.

Typically the Miller very fine sandy loam is a brown very fine sandy loam, grading at 5 or 6 inches into a yellowish to reddish-yellow, heavier very fine sandy loam, which in turn passes into chocolate-red clay at about 15 to 25 inches. The subsoil is like that of the Miller clay. This type occupies a lower position than the Portland soils.

The Miller very fine sandy loam is not extensively developed in Jefferson County. The largest area occurs along the Arkansas River in the northwestern part.

The soil, where adequately drained, is well suited to all the staple crops of the region. It is protected by levees. Alfalfa should do well on it where the heavier subsoil is near enough to the surface to keep the crop from suffering from drought during the hot, dry weather of the summer. Alfalfa probably would not succeed, however, where the water table lies within 4 or 5 feet of the surface.

#### MILLER CLAY.

The Miller clay consists of a chocolate-red to dark chocolate red, fairly friable clay which either continues throughout the 3-foot section with little change or passes at about 12 inches into brighter chocolate red clay. In places the subsoil contains strata of sandy clay. In other places, chiefly in areas adjoining the heavy Portland soils, the subsoil at about 20 to 30 inches grades into drab or dark-drab clay, and the type includes small areas in which the subsoil below 25 inches consists of a very fine sandy loam. The type is highly calcareous. It is locally referred to as "buckshot land."

In the extreme eastern part of the county along Bayou Meto about 4,500 acres of this type occur which are not protected by levees, and consequently are flooded almost every year to a depth of 2 or 3 feet.

In its present state it is valuable only for its timber growth and as pasture. The timber consists mainly of hardwood, such as pin oak, white oak, red oak, hickory, and elm. A lumber mill is in operation at Waldstein, but the cut-over land, being subject to overflow, is not cleared for agriculture.

The Miller clay occurs as a first-bottom soil in the Arkansas River flood plain. Usually the largest bodies of the type are a considerable distance from the river. It occupies low, flat areas, generally lying from 3 to 5 feet lower than the adjoining soils. As a rule the transition of the higher lying soils into the Miller clay is not marked by sharp slopes, although there are places where a distinct slope of 4 to 8 feet occurs. Owing to the low position, rainwater collects over the surface and flows away through very sluggish drains. Much of this land is in need of ditching. Large areas of the type have been drained in this way, although even in areas so improved smaller lateral ditches are needed. The soil is very sticky when wet. On drying it breaks into small aggregates and forms a satisfactory seed bed. Cultivation of the soil is difficult, owing to its tenacious character.

The forest growth consists of several varieties of oak, including overcup, post, white, and red oak, hickory, elm, locust, hackberry, ash, and walnut. While only small areas of the type are in cultivation, its high productiveness is gaining recognition, and no doubt much of it will soon be cleared. Cotton yields from three-fourths to 1 bale per acre and corn 40 to 60 bushels on this type of soil in other areas. The Miller clay, the Yahola clay, and the Portland silt loam are the best alfalfa soils of the county. The Miller clay needs more thorough drainage for alfalfa, but with this improvement the type is particularly suited to this crop. Owing to its highly calcareous nature and its natural fertility, it is one of the most dependable types in the county.

#### SUMMARY.

Jefferson County, Ark., lies just southeast of the center of the State, within the Coastal Plain. It has an area of 878 square miles, or 561,920 acres.

The county comprises two general divisions—an upland plain, in the western part of the county, and a lower river flood plain. The upland is prevailingly level, with small undulating to gently rolling areas. The lowland, or river bottom, section is a nearly level plain bordering the Arkansas River, with narrow extensions reaching into the upland along the smaller streams. It is the most extensive

division, comprising about two-thirds of the area of the county. The border between the upland and bottom usually is marked by sharp slopes 10 to 20 feet high.

The county has a general slope to the southeast, the elevation ranging from about 307 feet to 192 feet above sea level.

The county is drained mainly by the Arkansas River, which flows through the center of the county from northwest to southeast. The county originally was forested, and lumbering is still an important source of revenue.

Jefferson County was first settled about 1817. It was organized in 1829. The population is reported in the 1910 census as 52,734, with 71.4 per cent classed as rural. Pine Bluff, with a population of 15,102, is the county seat and principal town. It is an important cotton market and distributing center.

In general, railroad transportation facilities are good. There are some good graded roads in the county, but the dirt roads generally are in poor condition in wet weather.

The mean annual temperature is about 63° F. The summer temperature averages about 81°, and the humidity is high. The winters are short and mild. The mean annual precipitation is about 51 inches, which is ample for agriculture. It occurs mainly in the winter and spring months. Serious droughts are rare. There is a normal growing season of 221 days.

Jefferson County is essentially an agricultural region. Cotton is the money crop. It was grown on 111,800 acres in 1909. Corn, acreage 27,720 acres, also is an important crop. Of the crops other than cotton not enough are produced to meet the home demand. Cotton is grown largely under the one-crop system, practically no crop rotation being practiced. The use of commercial fertilizers is increasing. The live-stock industries have never been important.

Agricultural conditions are largely unsettled, mainly on account of the ravages of the boll weevil.

Only about 18 per cent of the farms are reported as operated by the owners. The average size of the farms is given in the census as 50 acres, but each tenancy is classed as a farm, and some large plantations are occupied by 25 or 30 tenants. Some land holdings include 10,000 to 20,000 acres. Of the farm land, 54.2 per cent is reported improved, the percentage being greater in the bottom land than in the upland.

Farm labor is easily obtained. About 95 per cent of the laborers are negroes.

Twenty-two soil types, representing ten series, are mapped in the county. The soils are classed in two general groups, the upland or sedimentary soils and the lowland or alluvial soils. The upland

soils are the direct product of the weathering of unconsolidated sedimentary deposits of the Tertiary age. They comprise five soil series, the Ruston, Susquehanna, Caddo, Norfolk, and Lufkin. The upland soils, excluding the Ruston, are poorly drained and require ditching or tiling to make them fully productive. They are also acid.

The lowland or alluvial soils are derived from two main sources, (1) material transported from the Permian Red Beds, giving rise to the Miller series, and (2) reassorted material of the upland soils, forming the Portland and Yahola soils of the Arkansas River flood plain and the Ochlockonee and Bibb soils along the small streams traversing the upland. The heavier types of the bottom soils, the silty clay loams and clays, are usually imperfectly drained, a condition which can be improved largely through the construction of lateral drainage ditches to the main canals which are completed. The sandy and silt loam types of the alluvial soils constitute the best agricultural land in the county. They are very productive where carefully farmed.

There is a general lack of organic matter in the soils, a condition which warrants the general recommendation that every economical means be employed to increase this constituent through rotation, manuring, legume growing, and green manuring. This will necessitate greater diversification of farm enterprises than under the present one-crop system, but the change will increase the yields of cotton, the money crop. In addition a large part of the present expenditures for food supplies will be saved and the necessity of buying nitrogen in commercial forms will be to some extent removed.



[PUBLIC RESOLUTION—No. 9.]

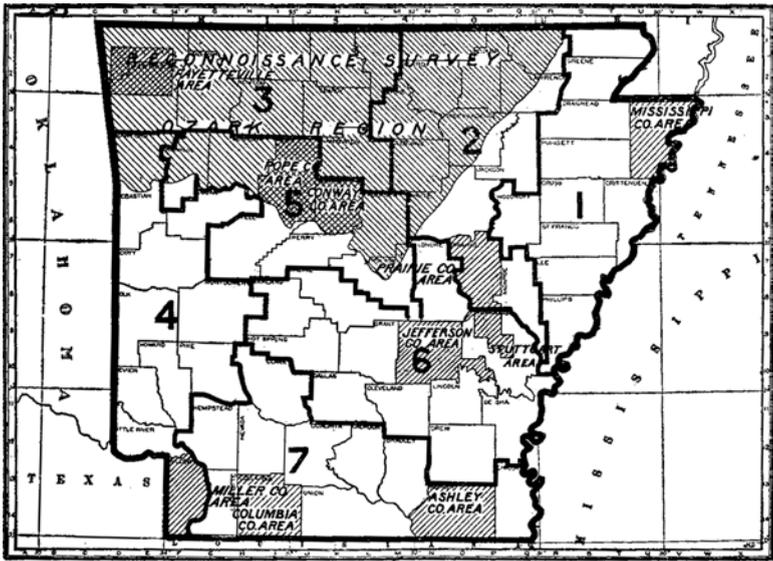
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]



Areas surveyed in Arkansas.

# **NRCS Accessibility Statement**

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