SOIL SURVEY OF CONWAY COUNTY ARKANSAS.

By JAMES L. BURGESS and CHARLES W. ELY.

DESCRIPTION OF THE AREA.

Conway County is located a few miles northwest of the geographical center of the State of Arkansas, and lies between 92° 52′ and 92° 30′ west longitude and 35° 5′ and 35° 27′ north latitude. On the north it is bounded by Van Buren County, on the east by Van Buren and Faulkner counties, on the south by Perry County and the Arkansas River, and on the west by Pope and Yell counties. The county is traversed in the southern part by the Fort Smith and Little Rock division of the Missouri Pacific Railway.

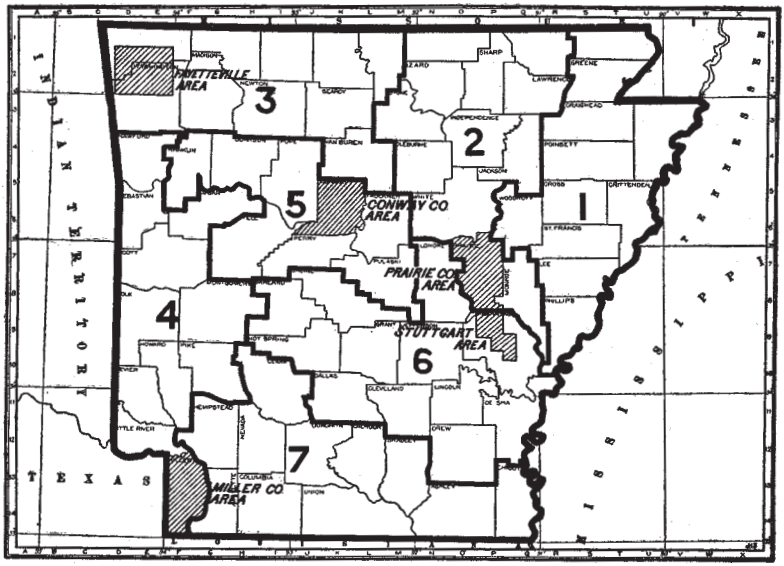

FIG. 24.—Sketch map showing location of the Conway County area, Arkansas.

There are two distinct physiographic divisions in the county. The more important from an agricultural point of view is the Arkansas River Valley. It is from 3 to 10 miles wide and is extended by the coalescing valleys of the Cadron and Point Remove creeks, which flow into the Arkansas River from the north, and by the valley of Petit Jean Creek, a tributary from the region to the south. The surface of the valley is level to gently rolling, the river having a fall

here of approximately 1 foot to the mile. Some of its larger tributaries, for instance Point Remove Creek, have an average fall of 20 feet to the mile. Most of the river bottoms are well drained and some thousands of acres are protected from annual overflow by levees.

The surface features of the uplands, or the second physiographic division, range from level to gently rolling, hilly, and mountainous. The average elevation of the county is about 500 feet above sea level, the lowest point being about 300 feet and the highest, where Petit Jean Mountain juts out into the Arkansas River Valley, about 1,000 feet. The most rugged part of the area lies north of a line running east and west across the county and some 8 or 10 miles north of Morrillton. North of this line are found many very pronounced residual hills, locally called mountains, the most important of which are Pigeon Roost, Wild Cat, Bull, Grayson, Lost, and Devils Knob mountains. The most broken part of the area lies west and northwest of Center Ridge and along Point Remove Creek, west of Cleveland. While there are thousands of acres of land among these mountains too rough for cultivation, there are on their tops mesalike plateaus that support a great many inhabitants. Here the surface features are not so broken and a great deal of good level land is found. Nearly all the area north of the river is drained by Point Remove Creek, which enters the river just south of Morrillton. All the precipitation over the county finally reaches the Arkansas River, mainly through Cadron, Point Remove, and Petit Jean creeks and their tributaries. The general slope of the area is to the south.

The physiographic divisions of the county also divide the population. The colored people are generally found as tenants on the fertile lands along the river, while most of the white people farm their own lands among the hills. Most of the people of the area are of native birth, their parents having come from the different southern States. Some years ago a colony of Germans and Swiss located here, some near Morrillton and some near St. Vincent. There is also a small colony of Italians in the neighborhood of Center Ridge. Most of the citizens of foreign blood are energetic and thrifty and make good farmers. The county contains at present something over 20,000 people. Morrillton, the chief town and county seat, claims from 2,000 to 3,000; Plumerville, the second town in importance, has from 400 to 500 people. The rest of the population is rural and composed mainly of farmers located in the hill country. There are a number of small country villages with schools, post-offices, churches, stores, etc., for the accommodation of the rural classes. The most important of these little towns are Springfield,

the old county seat, Center Ridge, Cleveland, Hattieville, and Solgohachia. The railroad being located far to the south, the farmers in the northern part of the county are compelled to haul their produce long distances to Morrillton, the nearest market. Morrillton and Plumerville are the chief points for selling and buying and from these points shipments of various kinds of produce are made to Little Rock and Memphis over the Missouri Pacific Railway. A very large exchange business is done at both Morrillton and Plumerville, since they are the nearest shipping points and trading stations for vast stretches of the mountainous country to the north and west of this area. Until recently country merchants hauled freight from Morrillton over 100 miles into the mountains.

CLIMATE.

Conway County is well within the humid belt of the Mississippi Valley, and, as the following table shows, has a precipitation of over 45 inches during the year. The temperature rarely reaches 90° F. in the summer and zero weather is uncommon in the winter. The climate is, therefore, equable. While the climate as a whole is generally mild and favorable to the production of the staple crops of the area, the range in elevation, from 300 to 1,000 feet, causes local differences in climate that are of extreme importance to fruit and truck growers. It is frequently noted that frost comes much earlier and much later in the valleys than on the "mountain" tops and slopes, and fruit growers must be careful to locate their orchards with due regard to these local differences, avoiding hollows where the cold air settles.

The following tables show the precipitation and temperature and also the dates of last killing frosts of spring and the first of fall:

Normal monthly and annual temperature and precipitation.

Month.	Conway.		Russellville.		Month.	Conway.		Russellville.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	*Inches.*	°F.	*Inches.*		°F.	*Inches.*	°F.	*Inches.*
January	39.4	3.72	39.8	2.97	August	79.2	3.04	79.7	3.30
February	42.3	4.13	40.9	3.01	September	73.3	3.38	73.4	3.90
March	51.9	4.85	52.2	5.29	October	61.1	2.07	61.2	2.95
April	62.3	3.57	62.1	2.93	November	49.9	4.09	49.8	3.46
May	69.6	4.82	69.8	4.91	December	42.4	3.95	42.3	3.13
June	75.8	4.02	77.3	3.79					
July	80.4	3.51	81.3	4.35	Year	60.6	45.15	60.8	43.99

Dates of first and last killing frosts.

Year.	Conway.		Russellville.		Year.	Conway.		Russellville.	
	Last in spring.	First in fall.	Last in spring.	First in fall.		Last in spring.	First in fall.	Last in spring.	First in fall.
1898.....	Apr. 7	Oct. 22	Apr. 6	Oct. 27	1902.....	Mar. 19	Nov. 26	Apr. 11	Nov. 27
1899.....	Apr. 9	Nov. 3	Apr. 9	Nov. 3	1903.....	Apr. 4	Nov. 7	May 1	Oct. 24
1900.....	Apr. 12	Nov. 9	Apr. 13	Nov. 7	1904.....	Apr. 10	Oct. 23	Apr. 10	Oct. 23
1901.....	Mar. 21	Nov. 16	Mar. 22	Nov.13	Average	Apr. 3	Nov. 6	Apr. 10	Nov. 4

AGRICULTURE.

Prior to 1825 part of this area lay in what was then the Indian Territory, and the old Cherokee line now runs through the town of Morrillton. Well-marked indications of Indian occupation are still to be seen.

It is not known when the white man first settled in this part of the State, but in 1825 there were citizens enough to warrant the formation of a separate county. Accordingly Conway County was taken piecemeal from Van Buren, Faulkner, Pope, and Perry, and obtained its present boundaries some time in the forties.

There was no railroad in the county before 1873, and up to that time all the traffic, except that done in wagons, overland, was by way of the river, the shipping point being old Louisburg, then the largest town in the area. The overland traffic was done by means of teams to Des Arc, some 80 miles away.

In farming operations oxen were generally employed, and all farm implements and articles of clothing were made in the local shops and on the private hand looms. At that time the few slaves in the area were generally confined to the bottom lands, only a small proportion of which were under cultivation.

Cotton and corn have been the staple crops of the area from the earliest times, and until recently little diversification has been practiced.

In 1873 the railroad came, and with it a great impetus to agricultural progress. Most of the cultivable land along the river has since been cleared and put under the plow; the river traffic has been reduced to that done by the ferry boats; and where hundreds of bales of cotton were once grown thousands are now produced. Old Louisburg has been practically abandoned and all its business houses moved to Morrillton.

Excepting a very limited lumber trade, there is no business done in the area, except in the exchange of agricultural products, and where old Louisburg did a volume of business of only a few thousand dollars a year, Morrillton alone now handles annually cotton, cattle, hides, miscellaneous country produce, cotton oil-mill products, general merchandise, etc., of a value of nearly $4,500,000. Plumerville

also does a volume of business of perhaps nearly $1,000,000 a year, to say nothing of the business transacted at the various smaller country villages throughout the area.

Most of the agricultural products exchanged at these various points are produced in the county, and the limit of production has by no means been reached.

The most valuable products are cotton and corn, although considerable money is realized from the sale of home-grown wines, apples, and truck. The one-crop system is largely practiced, but many of the more progressive farmers and land owners are beginning to grow a greater variety of crops and are producing peas, alfalfa, and fruits in addition to the staple crops.

Fruit trees are generally located in the hill country and on the tops of the mountains. In this case the recognition of adaptation appears to be one of location rather than of soils. As a rule the farmer puts his plants where conditions appear favorable, and must learn by experience that commercial success with certain crops can be attained only on certain soils and by definite methods of soil management.

The labor problem is not serious in this area, since most of the farmers operate their own farms and their work is done either by themselves or by the joint help of the family. There are a number of drifting laborers that may be hired for $20 or $25 a month during the summer.

Most farmers in the hill country own their farms, but the rich alluvial bottoms are generally farmed by tenants, and owned by various business men of the towns. The general size of the farms in the area is about 50 acres and the value ranges from $5 an acre in the uplands to more than $50 an acre in the bottoms.

There are several lines along which improvements in the agriculture of the area should be made. More attention should be given to the production of forage and feeding stuffs for consumption on the farm, to take the place of hay and grain now bought by the farmers. On all the hill lands an intelligent and systematic rotation of crops should be practiced; more cowpeas should be grown for both forage and grain, and these could be turned to good account in the production of pork, at least to the extent of supplying home needs. Most of the farmers might add materially to their income by raising a number of mules for the market. The conditions for this line of stock raising are favorable provided it is not attempted on too large a scale. There is great need that all the farmers, both in the bottoms and on the hills, should give special heed not only to maintaining the productive capacity of their farms, but to increasing it. Methods for doing this will be discussed in connection with the individual soil types.

SOILS.

The upland soils of Conway County are derived from rocks of Carboniferous age, the particular strata belonging to the Coal Measures. The surface of the area appears at one time to have been a nearly level plateau, but erosion and subterranean disturbances have carved and twisted the surface into a multiplicity of ravines, gorges, and escarpments, and dotted it with many residual mountains. A great fault, or fracture, traverses the area from west to east and presents a number of interesting features. This fault is about 10 miles wide and is made up of a number of anticlines and synclines, running in a general parallelism with the river. The strata dip both north and south, while their strike runs in an easterly direction. The most important syncline in this disturbed area contains the present bed of the Arkansas River.

The underlying strata of the area are composed of interstratified layers of sandstone and shale. The upper sandstones belong to the Millstone grit, while the shales belong to the more argillaceous materials of the Coal Measures. Some of the strata of the Millstone grit are held together by a ferruginous cement, while others are bound together by a siliceous matrix. This difference in the cementing material gives rise, in the weathered product, to two different types of soil. The shales are usually more or less arenaceous and silty, and where they are exposed, either by disturbance of the earth's crust or by the erosion of thin beds of sandstone from above, a heavier type of soil, corresponding closely to the material of the underlying rock, is developed.

All the soils of the uplands show markedly the influence of differences in the underlying rocks. These rocks are disintegrated to a depth of from a few inches to 30 or 40 feet, the greatest depth of the soil mantle occurring where the shales are exposed. With the exception of the fault discussed above, the strata lie practically horizontal over the entire area, and where the sandstone is thickest are found the residual mountains with their broad table-lands on top. Around the edges of these plateaus erosion has developed a type of soil that includes the various escarpments and rough stony areas.

The soils in the bottom lands are markedly different from those in the hills. They are derived from sediments gathered over the vast territory drained by the Arkansas River from here back through the Territories, Kansas, and Colorado to the Rocky Mountains. Flowing as it does through a vast stretch of semiarid territory, enormous amounts of unleached sediments are carried in its waters during the annual floods and intermixed with the local sediments brought down by the streams of the area. The bottom-land soils are, therefore, an admixture of arid, semiarid, and humid sedi-

ments, thus making a soil of well-balanced fertility. These soils are all of fine texture and the most productive in the area. All the soils in the area, however, both residual and alluvial, appear to lack sufficient lime for crop requirements.

There are two types of soil on the uplands that, by reason of their peculiar structural features and topographic position, are not always sufficiently well drained for the staple crops. The bottom lands are generally well drained, excepting a few local depressed areas where the surface drainage collects, and a large tract of heavy clay land of level to flat surface northwest of Morrillton, where the bottom lands along Point Remove Creek join those of the Arkansas River. Here ditching and tile drainage must be resorted to for success with the ordinary cultivated crops.

The water table in the lowlands varies in depth from a few inches to perhaps 10 feet or more, rising and falling with the rise and fall of the water in the river. The subdrainage of these lowlands is effected largely through the thick layer of sand that is found at various depths under these soils generally.

The soils of the area have been classified, according as they differed in origin, mechanical composition, depth of soil and subsoil, topographic position, and agricultural value, into nine different types. Five of these occur on the uplands and four are found along the streams. On the uplands are a silt loam, a loam, a fine sandy loam, a stony loam, and a type known as Rough stony land. The soils of the bottom lands have been differentiated into four types, viz, a fine sand, a fine sandy loam, a silt loam, and a clay.

The soils of the hill country have been correlated with the Fayetteville series of soils. The river-bottom soils belong to the Wabash, which has its typical development along the Mississippi River and its upper tributaries.

The following table gives the names and extent of the several types of soil found in this area:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Fayetteville stony loam	118,400	32.2	Fayetteville fine sandy loam	17,216	4.7
Rough stony land	82,368	22.4	Wabash fine sandy loam	10,112	2.7
Fayetteville loam	44,352	12.1	Wabash fine sand	4,480	1.2
Conway silt loam	38,912	10.6			
Wabash silt loam	28,928	7.8	Total	367,808	
Wabash clay	23,040	6.3			

FAYETTEVILLE STONY LOAM.

The soil of the Fayetteville stony loam is composed of various grades of rock material ranging from clay to good-sized gravels and

stones. It contains a large percentage of fine gravel composed of shale and sandstone fragments. This gravelly nature extends frequently to great depths and renders the structure of the soil quite open and porous. Neither the texture nor the structure is uniform over very wide areas, but small clayey, sandy, and gravelly phases are found here and there, corresponding closely to differences in the underlying country rock. The soil is of a gray to reddish-gray color and about 14 inches deep. The depth of the soil is rather uniform. The subsoil varies in texture from fine sandy and gravelly material to clay and silt. In depth it ranges from 1 foot to 30 feet, but it is always underlain by flat rock masses. Sometimes the sandstone comes to within a few inches of the surface and renders the soil useless for general agriculture. These areas, where the country rock lies horizontal and too near the surface, may easily be detected by the nature of the vegetation. No well-developed trees grow here, and the land is generally very wet, owing to the inability of the water to sink below a certain point. Farms in the uplands should be carefully searched for these shallow soil areas, because there are tracts with attractive topographic features, but with an impenetrable layer of sandstone just beneath the surface, and with both soil and subsoil not more than 1 or 2 feet deep. The color of the subsoil changes from yellowish-gray to red and yellow, and generally contains a large percentage of gravel. This type of soil is easily cultivated, except for the resistance offered by rocks and gravel.

The Fayetteville stony loam is an upland soil and the most widely distributed type in the area. Its greatest development is found in the northeastern part of the county, but small areas are scattered here and there over all parts of the hill lands. The surface of this type is rolling to hilly. With the local exceptions noted above it is always well drained both topographically and texturally, having a generally open and porous subsoil as well as a rolling surface. It is found on both high and lower elevations; it occupies ravines as well as the table-lands on the mountain tops.

The Fayetteville stony loam is derived from the breaking down of shales and the more ferruginous members of the Millstone grit strata of the Coal Measures. There are always certain parts of these iron-cemented sandstones, and of the shales as well, that are quite resistant to weathering, owing doubtless to the character of the cementing material, and hence there are found remaining in the soil innumerable shale and sandstone fragments of dark-brown and reddish colors. In the case of the sandstone, the broken bits may range in size from that of a pea to huge bowlders.

The weathering of these rocks has been effected by the action of acidulated waters on the iron cement and also by temperature

changes. The shales break down readily under the action of cold and heat, hydration, physical absorption of water, the action of plants, etc. Wherever the rocks are found on or near the surface they are systematically split into rectangular forms that to the casual observer appear like bricks of various sizes. It is characteristic of the sandstones and arenaceous shales of this area to break at right angles when weathering; thus the flat rocks in the stream beds always present a checkered appearance and rectangular blocks are plentiful all through this type of soil.

The native vegetation on the Fayetteville stony loam is post oak, black oak, and blackjack oak, with some hickory and various shrubs. This is perhaps the best apple, peach, and grape soil in the county, and, with better transportation facilities, a large and profitable fruit industry might be developed. With present market conditions about the only fruits that can be safely recommended, except where the land lies near the railroad, are apples and grapes. This is because apples will keep for a number of weeks, and grapes may be made into wine at once. Apple growing may be made quite profitable on this soil. The crops grown at present are corn, cotton, some apples, and grapes. The farmers consider this the strongest of the upland soils. When first brought under the plow it sometimes yields as high as one-half bale of cotton and 25 bushels of corn to the acre. Unless care is used to replenish the organic matter this virgin productiveness disappears after a few years of continuous cropping and in about fifteen years the farmer must clear new fields. About 15 bushels of corn and one-third of a bale of cotton per acre are fair average yields, taking good and bad years into account. If the farmers will rotate their crops, however, and take the precautions observed by the best farmers of the country, there is no reason why the fields should not be made much more productive and maintained in that condition.

Small one-horse implements are in most general use, though many of the farmers are adopting more improved machinery in the cultivation of this soil. The land should be plowed about 5 inches deep on an average. The great need of this, as of the other upland soils, is more organic matter, and a rotation of crops should be arranged by which this end may be attained. Land broken in the fall should be sown to rye, which may be plowed under in the spring. A systematic rotation should be adopted, for instance, cotton one year, corn one year, and cowpeas one year, followed by fall-sown rye, to be turned under in the spring before cotton is planted. There is little fertilizer used on this soil at present. The price of land varies with location from $5 to $20 an acre.

The following table gives the results of mechanical analyses of fine-earth samples of the Fayetteville stony loam:

Mechanical analyses of Fayetteville stony loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16298	Soil	0.2	0.5	0.6	26.9	32.9	32.2	6.5
16299	Subsoil	1.6	3.1	1.4	11.2	16.2	43.5	22.4

FAYETTEVILLE FINE SANDY LOAM.

The surface 8 to 12 inches of the Fayetteville fine sandy loam is composed of fine sand with varying amounts of silt and a small percentage of clay. There are small areas of the Fayetteville stony loam found scattered through this soil, and the typical areas may contain a small amount of fine gravel. The color of the soil is gray to reddish gray. The depth of the subsoil varies, but is usually from 10 to 20 feet. Some small areas are found where the underlying strata come within less than 4 feet of the surface. The subsoil is gray to reddish gray in color and is composed of fine sand and clay, and usually has a fine sandy clay texture. The soil is quite easily tilled, being loose and light for several inches below the surface.

The Fayetteville fine sandy loam is found in the northern part of the county. Near Center Ridge there are comparatively large tracts of it, as well as on Pigeon Roost Mountain and west of Jerusalem. The surface is generally level to gently rolling, and during an average season the drainage is good, but when the season is unusually wet there are some areas that may require ditching.

The Fayetteville fine sandy loam is derived from the weathering of fine gray sandstones of the Millstone grit formation. In contradistinction to the ferruginous material of this formation, giving rise to the stony loam, the rocks from which the fine sandy loam is developed are of light-gray color and held together by a siliceous cement, which, under the influences causing disintegration, seem to break down uniformly, leaving few or no fragments in the resulting soil. We thus have two soil types derived from essentially the same rocks, but having quite different compositions.

The native vegetation on this soil is essentially the same as that found on the stony loam, except that the development is generally better and more white oaks are noted. This is the best early truck soil in the uplands. It would also produce profitable crops of peanuts, as well as good crops of cowpeas and potatoes. The crops grown are corn and cotton. When new this land is capable of producing about 30 bushels of corn and about one-half bale of cotton to the acre, but after about twenty years' cropping without rotation

or manuring the producing power is reduced to a point where the yields are no longer profitable and the fields are "turned out." An average yield is about 10 bushels of corn and one-quarter of a bale of cotton to the acre. The cultural methods and crop rotations for this type are essentially the same as those recommended for the stony loam, except that the annual plowing should be somewhat deeper, because of the heavier subsoil and the different line of crops to which the soil is adapted. The price of this land is about the same as that of the stony loam.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Fayetteville fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16300	Soil	0.7	0.6	2.0	25.6	9.5	54.0	7.2
16301	Subsoil	.5	.5	1.8	19.4	5.9	52.6	18.7

FAYETTEVILLE LOAM.

The soil of the Fayetteville loam is composed mainly of fine sand and silt to a depth of about 8 inches. In color it grades from yellow to reddish yellow. It carries only a small proportion of organic matter. A little gravel is found on the surface in some places, but such areas are generally cultivated. The subsoil has good depth and always rests on more or less decomposed shale. In color the subsoil ranges from yellow to mottled-yellow and red. It carries a large quantity of silt and clay and many iron concretions are present in depressed areas.

This type is found largely in the southern part of the county, with only a small area in the northwest. The largest single area is found on Petit Jean Mountain, and the second largest near Morrillton. The surface of this soil is usually gently rolling, but some depressed places are found where drainage is deficient. The soil has a tendency to run together or puddle after a rain, and its peculiar structure causes it to become waterlogged easily. Water moves through it very slowly and stands on the surface many hours after a rain.

The Fayetteville loam is derived from the breaking down of shales which belong to the Coal Measures group. These shales are weathered deeply in places; in others the small streamlets have cut down to bed rock only a few feet below the surface. These shales are dark colored, while the resulting soil stratum is yellow to reddish yellow.

Most of this soil is now under cultivation, the native vegetation having been removed many years ago. It is apparent, however, that the original forest growth consisted of various kinds of oaks, similar

to those on the other soils of the area, though they appear to have had a better development. Among the smaller plants found on this soil the Japan clover is important.

This is a fairly strong type of soil and its great water-holding capacity fits it for a line of crops quite different from the drier soils of lighter texture. It is perhaps the best corn soil in the hill country and is equally adapted to grass and certain other forage crops requiring much moisture and a soil of medium close texture. Certain vegetables and fruits, such as potatoes, cabbage, strawberries, etc., may be grown successfully on this type. When heavily limed good yields of alfalfa may be secured, and it is recommended that this forage plant be used in a limited way on every farm containing this soil. Alfalfa is preferable to cowpeas on this type for forage purposes, but it will be found that a good stand of alfalfa is more easily secured following a crop of cowpeas.

The crops grown at present are corn and cotton. When fresh this land will produce about 30 bushels of corn and about one-half bale of cotton, but its productiveness soon declines with continuous cropping to hoed crops, showing the necessity of employing green manuring crops. The average yields are 15 bushels of corn and one-third of a bale of cotton to the acre.

This soil should be plowed deep and an effort made to keep it well suppled with humus. Liming is recommended and also a rotation of crops in which either grass or some leguminous crop shall follow the hoed crops once in every four years. This land now has an average value of $25 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Fayetteville loam:

Mechanical analyses of Fayetteville loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16302	Soil	2.6	2.6	0.7	1.3	6.4	74.6	11.2
16303	Subsoil	2.2	2.1	.5	1.1	3.2	69.7	21.6

ROUGH STONY LAND.

The Rough stony land is practically worthless for general agricultural purposes. It includes the various escarpments, stony breaks, deep gorges, and other broken surfaces that lie untouched in the hill country. There are, however, some slopes on the mountain sides where it would be possible, and sometimes quite feasible, to grow apples and grapes, though in general this land is too rough and too steep for the use of horses in cultivation.

This land lies principally in the northern part of the county. A considerable body is found, also, on Petit Jean Mountain, south of the river. There are many square miles of this type scattered here and there over the area.

CONWAY SILT LOAM.

The Conway silt loam is a transition type between the upland soils and those found along the streams. The soil is composed of very fine sand and silt. It has a rather close structure, and the color is generally yellow to gray, depending on the amount of organic matter present. The soil is about 6 inches deep, resting on a subsoil of similar texture, but of a yellow to nearly white color, which varies with the drainage conditions. The soil and subsoil frequently carry iron concretions, and in some places the subsoil shows an iron hardpan. The type is characterized by numerous mounds, ranging from less than 10 to more than 50 feet in diameter and from 2 to 6 feet in height. These mounds reduce greatly the agricultural value of the land.

The greater part of this soil is found in close proximity to the bottom lands in the southern part of the area. There is, however, a large body of it lying northeast of Morrillton on the uplands, considerably removed from the river. Small patches are found scattered at various places where conditions are favorable for its development. The areas are low and wet, have a gently rolling to flat surface, and are usually surrounded by higher ground, the drainage waters from which pass over this soil, producing conditions of poor drainage, and large areas must be ditched and tiled before cultivation can be carried on successfully. The water stands on or near the surface for long periods after rains and the water table is always near the surface.

Some of this type appears to be a true second bottom, while some other parts seem to have an origin similar to that of the Fayetteville loam and to be residual material derived from the weathering of shales. That found in close proximity to the river has doubtless been formed at an earlier period by river action, while that in the uplands appears to be a true residual soil, owing its present characteristics to its peculiar topographic position.

The native vegetation consists of a variety of oaks, prominent among which is the post oak. There are some shrubs, such for instance as the haw. Various lowland grasses are found. There is a large percentage of this type yet in its virgin state, and that which is under cultivation produces only indifferent yields of corn and cotton. The mounds that cover its surface so generally soon lose their fertility and appear as light spots that contain little or no

organic matter. Twenty bushels of corn and one-fourth bale of cotton are good average yields for this soil in its present condition. This type needs good drainage and heavy liming. The soil itself does not appear to be unproductive, but its poor physical condition prevents the true value of the land being brought out. When this condition shall be corrected the soil should be one of the strongest in the county and, by reason of its silty texture, well suited to such crops as cotton, corn, and vegetables, as well as to certain of the grasses. At present it may be used for pasture, and only the better drained areas for general crops. This land is now worth, on an average, less than $10 an acre.

The following table shows the texture of the soil and subsoil of the Conway silt loam:

Mechanical analyses of Conway silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16294,16296	Soil	0.3	0.9	0.5	8.0	12.6	64.4	13.3
16295,16297	Subsoil	.2	1.1	.6	6.0	11.7	58.5	21.4

The following sample contained more than one-half of 1 per cent of calcium carbonate ($CaCO_3$): No. 16296, 1.86 per cent.

WABASH CLAY.

The Wabash clay is the heaviest soil in the county. It is composed very largely of clay, but contains considerable organic matter. It has a prevailing dark-brown to black color, though some limited areas of reddish-brown are noted. The soil has an average depth of about 12 inches. The subsoil is very similar in composition to the soil, except that it contains a smaller amount of organic matter and has a slightly lighter color. It is not known just how deep the subsoil is, but it is generally over 3 feet deep. This type of soil is difficult to cultivate and requires careful manipulation for the successful production of crops. It is said that a good crop is rarely harvested from it on account of its heavy, clayey composition.

The largest body of Wabash clay is found northwest of Morrillton, where the bottom lands along Point Remove Creek join those of the Arkansas River. There are other rather large areas in the river bottom proper, lying southeast of Morrillton and south and southeast of Plumerville. The surface of this soil is level to flat, and the drainage, both surface and textural, is generally inadequate. The water table often stands within 1 or 2 feet of the surface and the rainfall drains but slowly into the ditches.

This is an alluvial soil, and has been mostly deposited by the joint action of the flood waters of the Arkansas River and Point Remove

Creek. These flood waters meet in such way that a vast area of still water (back-water) is made at their junction and over this area the clayey sediments brought down by Point Remove Creek from the shaley areas in the mountains are forced to settle. In other parts of the bottoms these clayey areas mark old lake beds or old river channels where muddy waters have stood after a flood. The vegetation peculiar to this type consists of various kinds of water-loving oaks, willow, cypress trees, etc. In its present condition the production of corn and cotton has not been found profitable on most of this type. There are some local areas, however, where there is a substratum of fine sand not far below the surface, on which cotton and corn make a rank growth. But even here the cotton is apt to go to weed and the corn to stalk. As it stands now, in all probability, the most promising crop for this soil is some kind of a hay crop or rice. There is little doubt that the large area lying northwest of Morrillton will, in its present condition as to drainage, produce very profitable crops of rice. The land would of course have to be protected from floods, but there appears to be no physical difficulty in the way of profitable rice production. At the present time about the only crops grown are cotton and corn. Some farmers have attempted to grow alfalfa, but success with alfalfa on this soil is doubtful and in all probability the growing of this crop will soon be abandoned. Chemical test shows this soil to be low in lime, an element necessary to the successful growing of all leguminous plants. Perhaps the best method of handling this heavy clay consists of very deep plowing with the disk plow, heavy liming, and a good system of open and tile drains. Its productiveness when brought into good condition is great. The price of land of the Wabash clay type ranges from $25 to $50 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Wabash clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16309	Soil	0.0	0.2	0.7	3.9	4.2	58.2	32.8
16310	Subsoil	.0	.5	.9	1.8	1.6	49.4	45.3

WABASH SILT LOAM.

The Wabash silt loam is composed very largely of silt. It also contains a rather large proportion of humus, which gives it a dark color. The soil is about 10 inches deep and overlies a subsoil composed of silty clay that becomes heavier with depth. The surface soil contains some fine sand, and this, together with the included organic matter, causes it to be cultivated with comparative ease.

The Wabash silt loam is located in the bottom lands, both along the rivers and the smaller streams. The largest development is found near the junction of the east and west forks of Point Remove Creek. The surface is gently rolling to flat. The areas found in the river bottom are generally well drained and under cultivation, while that lying south of Hattieville is poorly drained, even swampy, and yet in its virgin state. In order to protect this and most of the other soils of the bottom lands from inundation by the occasional high water in the streams a system of drains and levees will have to be constructed.

This is an alluvial soil formed, as in the case of the Wabash clay, from deposition in slowly moving water. The native vegetation consists of various oaks, such as the willow oak, water oak, together with elm, hickory, gum, etc. The more poorly drained parts of this type are found in close proximity to the large body of clay to the northwest of Morrillton, and here rice culture might be successfully practiced. In this part of the area drainage is needed before other crops can be produced. This soil, where it is well drained, as in some parts of the river bottom proper, is the most productive of the bottom-land types, and the best soil in the county for cotton and corn. Where the water table is from 5 to 10 feet below the surface, alfalfa may be produced with marked success. Care must be taken, however, to eradicate the Bermuda grass that prevails so generally on these bottom soils. The crops grown at present are cotton, corn, and some alfalfa. Under favorable conditions a bale of cotton and 60 bushels of corn to the acre are secured, and a fair average yield would be about two-thirds of a bale of cotton and 40 bushels of corn to the acre.

There is some complaint that cotton makes too much weed and too little lint, and that corn runs too much to stalk. While good yields are often secured they are occasionally much below what might be reasonably expected from so rich a soil. These facts suggest certain cultural methods which are applicable both to this and the clay soil. These soils should be plowed deeply with the disk plow and heavily limed. The cotton should be planted as early as possible; the rows should be wide apart, and should run north and south. When the plants are about ready to be laid by, the central stalk and all the main branches should be severely topped in order to check the growth of wood and cause the plant to set more fruit buds. Running the rows north and south will give the maximum of sunshine so necessary to make cotton open in this latitude. All these bottom soils are in need of more lime and its free application is recommended for all crops. It is also recommended in the production of cotton in the bottom lands that the check-row system be adopted in order to use modern machinery and thus reduce the cost

of production. This land, where it is under the plow, is worth about $50 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Wabash silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16307	Soil	0.0	0.1	0.2	1.1	8.8	74.3	15.4
16308	Subsoil	.0	.1	.2	1.9	5.8	68.2	23.8

WABASH FINE SANDY LOAM.

The soil of the Wabash fine sandy loam is composed of fine sand and silt intermingled with a fair amount of organic matter. It has an open structure and is quite easy to cultivate. The soil is about 11 inches deep, and rests upon a subsoil composed mainly of fine sand. Both the depth of the soil and the nature of the subsoil vary, but the type as a whole has a rather light texture. The color of the soil is reddish-gray, while that of the subsoil is reddish-yellow to gray.

The Wabash fine sandy loam is confined to the river bottom and is found lying either between the silt loam and the river or between the silt loam and the fine sand to be described later. It has its greatest development south and west of Morrillton and south of Plumerville. The surface is gently rolling and the light sandy subsoil allows excellent drainage. This soil is alluvial in origin, having been laid down by the river during flood seasons. The loamy nature is due to the shifting of the course of the stream channel by which fine silty sediments have been deposited on the fine sands that once marked the places of small islands and the immediate river bank where the overflow currents were swiftest.

Most of the native vegetation has been removed from this soil, but there is enough left to show that the pecan, the cottonwood, the sycamore, and the walnut were important. This soil is well suited to all crops that flourish in a well-drained, light soil. Hence, peanuts, early truck, sweet potatoes, etc., can be successfully grown on it. While the natural productiveness is not very great, the good physical condition of the soil results in fair crops of corn and cotton. One-half bale of cotton and 25 bushels of corn may be considered good yields, with an average of about one-third bale of cotton and 20 bushels of corn to the acre.

The Wabash fine sandy loam should be plowed with the ordinary share plow. A crop rotation should be adopted by which more organic matter could be added each year. Bermuda grass generally badly infests this type, and as this greatly increases the cost of pro-

duction steps should be taken to eradicate it. It should be turned under deeply—not a spear left on the surface—and some crop, such for instance as cowpeas, should follow to shade the land thoroughly for one or two summers. This grass could thus be destroyed and at the same time a profitable forage crop might be harvested. This land is worth about $25 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Wabash fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16305	Soil	0.0	0.1	1.6	26.4	26.1	39.2	7.0
16306	Subsoil	.0	.7	14.9	69.9	3.0	9.1	2.9

WABASH FINE SAND.

The Wabash fine sand is composed of a homogeneous fine sandy material generally over 3 feet deep. It is yellow in color and carries little organic matter. The structure is open and porous, and water soon passes down through it. The surface is rolling, and some small dunes are noted.

This type marks the sand banks and islands in the river channel, as well as the overflow areas lying immediately on the bank of the stream. The sand has been deposited by the annual flood waters and drifted into irregular shapes by the currents and by wind action.

Very little of this soil is under cultivation, as it is too light to grow crops, and where there are heavy phases its position with reference to the river is such that flood waters do the greatest damage. Some cotton is grown here and there upon spots having a heavier texture.

The following table gives the results of a mechanical analysis of a sample of the soil of this type:

Mechanical analysis of Wabash fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16304	Soil	0.0	0.0	0.1	76.0	19.0	3.4	2.2

SUMMARY

Conway County, Arkansas, is located near the geographical center of the State and is traversed from west to east in its southern part by the Arkansas River. The Missouri Pacific Railway Com-

pany operates a line from Little Rock to Fort Smith through this area.

The surface of the county is gently rolling to rough and mountainous, Petit Jean Mountain being the highest elevation in the area. There is a broad valley along the Arkansas River, and here are found the best agricultural lands of the county. The area is well drained, except for a few thousand acres to the north and northwest of Morrillton. Here ditching and tile draining will be necessary for profitable production of crops.

While a number of colored people are found around the principal towns and scattered over the bottom lands, the great majority of the population is white and generally of southern origin. There are, however, a number of Germans, Swiss, and Italians.

The two most important towns are Morrillton, the county seat, and Plumerville. These have been built since the advent of the railroad in 1873. The county was formed in 1825, prior to which time it was a part of the Indian Territory.

Corn and cotton have been the staple crops from the earliest settlement, and prior to 1873 were shipped to market on the Arkansas River.

The one-crop system is still in use, although some of the farmers are beginning to diversify and to introduce some new crops, for instance, fruit and alfalfa. Little or no attention is given to crop rotation.

The soils of the area have been classified into nine types. Five of these are residual upland and four are alluvial bottom soils. The upland soils have been correlated with the Fayetteville series, and the bottom soils with the Wabash series.

Some of the upland soil types, notably the Fayetteville stony loam, are well suited to the production of apples where sufficient clay is found in the subsoil. There are phases of this type that could be used profitably in the production of peaches, provided a shipping point is sufficiently near.

The soils along the river are wholly different from those on the hills and require different treatment. Most of them are well suited to the production of cotton and corn and two types, namely, the Wabash clay and the Wabash silt loam, will grow good crops of rice in those areas where the surface is flat and the drainage somewhat poor. The Wabash silt loam, where the water table is from 5 to 10 feet below the surface, will grow good alfalfa. This is also true of the Wabash clay where good surface drainage can be secured.

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.