

# SOIL SURVEY OF APPOMATTOX COUNTY, VIRGINIA.

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## LOCATION AND BOUNDARIES OF THE AREA.

Appomattox County is situated in the south-central part of Virginia. It is bounded on the northwest by the James River, which forms the boundary separating Appomattox from Amherst County; on the northeast by Buckingham County; on the southeast by Prince

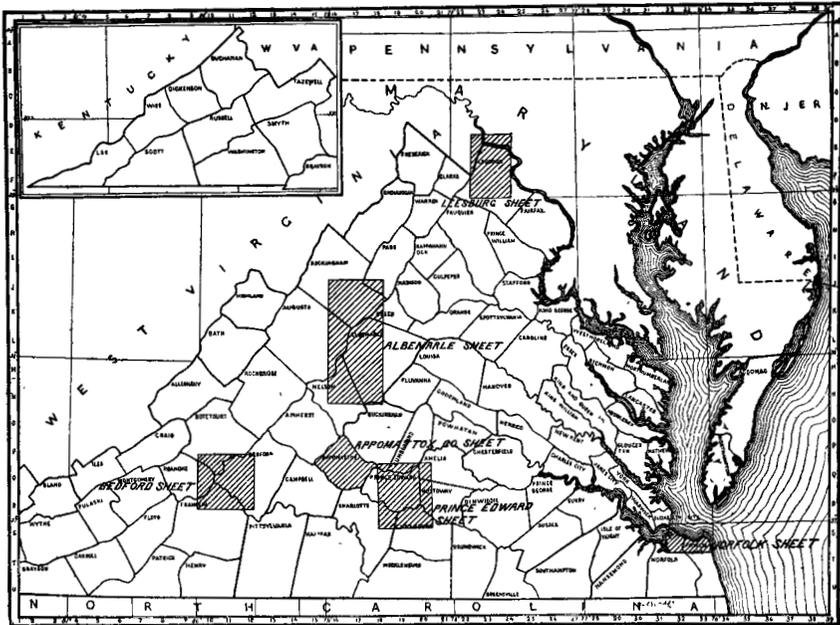


FIG. 4.—Sketch map showing location of the Appomattox County area, Virginia.

Edward and Charlotte counties; and on the southwest and west by Campbell County. The present survey includes the entire county and covers an area of 217,792 acres, or approximately 340 square miles.

## HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

Appomattox County was organized in 1845, having been formed from parts of Buckingham, Campbell, Charlotte, and Prince Edward counties. The region was originally settled by colonists, mostly

English, with a few Huguenots, Germans, and Irish. The descendants of these and a few families who have come from the west and north since the civil war constitute the white population of the area at the present time. During the slavery period the population was about equally divided between whites and colored, but in recent years, owing to the better wages paid elsewhere, especially in the coal fields, the colored population has decreased. The white population has increased, but the population as a whole has gained little in the last decade.

Even in the early days the area was practically self-sustaining. There were several large plantations and each of these formed practically an independent community. Flax, cotton, and wool were produced, spun, woven, and made into clothing, but tobacco, wheat, and corn were the principal crops grown, and some live stock was raised. The live stock was driven to Richmond and sold, the corn was consumed at home, while the wheat and tobacco were either marketed in Lynchburg or carried to points upon the James River and shipped in flatboats to Richmond. The construction of the James River and Kanawha Canal and later the laying of the Norfolk and Western Railroad gave a decided impetus to farm operations in the area.

Appomattox County has become historical because of the fact that within its borders was enacted the last scene of the war between the States, when, at Appomattox Court-House, Lee surrendered his army to Grant, on April 9, 1865. As a result of the war some of the former slave owners found themselves with practically no capital and no efficient labor with which to resume their farming operations. They were, in fact, "land poor," and were able to cultivate only a part of the cleared fields, large areas being abandoned to grow up to old-field pine or to be subjected to severe washing and gullyng. Not being able to adjust themselves readily to the changed conditions, many were obliged to sell their lands at a sacrifice, either to pay the debts contracted before the war or to satisfy the tax claims. It thus happened that the large plantations were divided into smaller farms, which gradually fell into the hands of either those who in antebellum days were the working people or those who have grown up under the changed conditions. There are a few negroes in the area who own small tracts of land. At the present time the wealth of the county is more evenly distributed than formerly. The farms are smaller and are owned largely by people who do their own work.

#### CLIMATE.

The proximity of the area to the mountains makes cotton growing unprofitable, and none is at present produced. The climate is favorable to the growing of wheat, corn, oats, tobacco, fruit, and vegeta-

bles, and to the raising of stock. Stock has to be housed only about three months of the year.

The normal annual precipitation is about 43 inches. The precipitation is uniformly distributed throughout the year, but during the growing season crops sometimes suffer because of periods of drought.

The altitude of the area is not quite sufficient for the best results in apple and peach growing, on account of the late frosts in the spring. On the highest points and on the small elevations away from the streams the best results are obtained. The trouble with the lower locations is that the cold air settles in them, and frosts are more likely to do damage when the trees are in bloom. There are no extensive areas in the county which are high enough to be above the "frost line."

The following table shows the normal monthly and annual temperature and precipitation at Lynchburg. This station of the Weather Bureau is situated in Campbell County, at an elevation of 524 feet, which is not far from the mean elevation of Appomattox County:

*Normal monthly and annual temperature and precipitation.*

Month.	Lynchburg.		Month.	Lynchburg.	
	Temperature.	Precipitation.		Temperature.	Precipitation.
	° F.	Inches.		° F.	Inches.
January .....	36.8	3.95	August .....	75.3	4.01
February .....	40.0	3.53	September .....	69.0	3.81
March .....	45.2	3.67	October .....	57.1	3.26
April .....	55.9	3.36	November .....	46.3	2.94
May .....	66.0	3.91	December .....	39.3	3.05
June .....	74.2	3.46	Year .....	57.0	42.85
July .....	78.4	3.90			

#### PHYSIOGRAPHY AND GEOLOGY.

Appomattox County is located in the Piedmont Plateau and belongs to the geographic division of the State known as Middle Virginia. As viewed from the nearby mountains to the northward, it has the general appearance of an eroded plain, but in traveling across the area its surface is seen to be greatly eroded, hilly, and cut by the channels of many streams.

The area is drained in the north by the James River, and in the south by the tributaries of the Stanton River. The divide between these two river systems is a ridge crossing Appomattox County from Concord to Pamplin City. The altitude at Concord is 840 feet, while that at Pamplin City, about 25 miles southeastward, is 678 feet.

The influence of the James River along the northern boundary of the county has greatly modified the usual topography of the plateau. The valleys are comparatively wide, but instead of the broad, gently

rolling interstream ridges characteristic of the plateau, they are usually narrow, sometimes greatly eroded, and rough, making many of them undesirable for general farming. The altitude of the James River is less than 450 feet, so that the streams north of the divide have a fall of from 200 to 400 feet within a distance varying from 10 to 20 miles. South of the divide the tributaries of the Stanton River leave the area at an altitude of about 500 feet, but the fall is more uniform, the interstream ridges are broader, leveler, and less dissected than those north of the divide, and hence more desirable for agricultural use. The highest points in the county are Pine and Pilot mountains, which rise to an altitude of 1,050 feet so that within the area there is a range in elevation of over 600 feet.

Throughout the area the roads follow the ridges. The difference in elevation between the ridges and the streams varies from 50 to 275 feet, and it is more difficult to haul heavy loads long distances than would have been the case if the roads followed the valleys, where the grades could be made more uniform.

As would be expected in a region of such differences in elevation, the streams are too rapid and their courses too narrow to favor the accumulation of extensive sediments, hence the amount of bottom land or meadows is less than is usual for a Piedmont section.

The greater portion of the area is underlain by talcose and mica schists in which the particles of mica are very fine. Intermingled with these schists are small quantities of siliceous material which upon weathering imparts to the soil a sandy nature. The soil derived from the schists is principally the Cecil sandy loam, with occasional patches of Cecil clay. The sandy soil is usually found in all locations, from the gently rolling uplands to some of the steeper slopes. In a few locations, as for example, upon the narrow ridges and upon the steeper slopes where erosion has been more rapid than weathering, the sandy top soil has been washed away exposing the red subsoil of the Cecil sandy loam and giving it the appearance of the Cecil clay.

There are parts of the area underlain by a fine-grained, dark-colored gneiss, of which there are two varieties, the hornblendic and the chloritic. When the underlying gneiss contains considerable quartz it weathers slowly, forming hills which are usually covered with the typical Cecil clay, as in the vicinity of Appomattox. In localities, however, where the quartz is much less abundant the underlying rocks weather into gently rolling or nearly level areas, which are occupied by the Iredell clay loam. When the underlying gneiss abounds in chlorite the resultant soil, the Iredell clay loam, is remarkable for its greenish colors.

## SOILS.

There is not great variety in the soil material covered by this survey, and it was possible to classify it with six types already established by earlier surveys of the Piedmont Plateau. Of the entire area 77.5 per cent is occupied by one type, the Cecil sandy loam, and 14.5 per cent by the closely related Cecil clay; thus 92 per cent of the county is composed of but two distinct soils.

The following table gives the name and extent of each of the six soils to be described later on in this report, while the accompanying map shows the location of the various areas by means of different colors and symbols.

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil sandy loam .....	168,768	77.5	Cecil loam .....	1,408	0.6
Cecil clay .....	31,232	14.5	Cecil sand .....	960	.4
Iredell clay loam .....	9,664	4.4	Total .....	217,792	
Meadow .....	5,760	2.6			

## CECIL SANDY LOAM.

The soil of the Cecil sandy loam is a gray or brownish gray fine to medium textured sandy loam, ranging in depth from 4 to 15 inches. The subsoil is a red sandy clay, grading quickly into red clay, which becomes stiffer in the lower depths. Owing to the presence of many fine particles of mica and talc, the subsoil usually has an oily feel. At a great depth the subsoil grades gradually into the underlying disintegrated micaceous and talcose schists of the region.

The Cecil sandy loam is the most widely distributed type of the area. It is found in all locations from the tops of the ridges to the stream bottoms, and its topography is quite varied. Extensive areas on the slopes of the hills and ridges have never been under cultivation, largely for the reason that the soil is too thin, having a depth of only 4 or 5 inches, and is susceptible to drought on account of its slight water-holding capacity. It is also too steep and hilly to cultivate with ease, and the soil soon washes away, exposing the subsoil. Such areas are covered with black-jack oak, principally. In the leveler locations, usually away from the narrow ridges, the soil has an average depth of 8 inches or more, and the moisture conditions are much better. For this reason and also from the fact that it receives some of the seepage water from higher ground, there is less likelihood of drought, and larger areas are under cultivation.

The Cecil sandy loam, owing to its hilly topography, is naturally well drained. In fact it is apt to be too well drained, and even in the most favorable locations there is need of the addition of an

abundance of organic matter to make the soil sufficiently retentive of moisture to sustain crops during a dry season.

This type is a residual soil derived from the weathering of the underlying mica and talcose schists. The rock is usually weathered to a great depth and seldom appears on the surface except upon narrow, eroded ridges, in road cuts, and along stream bottoms.

The principal crops grown are heavy export tobacco, wheat, corn, and clover. Tobacco yields upon an average about 500 pounds per acre, although double that quantity may be produced by heavy fertilization and the best methods of cultivation. Wheat, when grown after tobacco, yields between 15 and 20 bushels per acre, but when grown after corn, yields only about 8 or 10 bushels per acre. The larger yield secured when following tobacco is due, it is believed, to the benefit received from the fertilizers applied to the tobacco crop. The average yield for corn is from 15 to 20 bushels per acre, although much larger yields are possible. The clover crop is usually light, and is grown more for its beneficial effects on the soil than for feeding purposes.

The following table gives the results of mechanical analyses of typical samples of the Cecil sandy loam:

*Mechanical analyses of Cecil sandy loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			mm.	mm.	0.25 mm.	mm.	0.05 mm.		
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
12208	Chap .....	Gray sandy loam, 0 to 10 inches.	1.3	10.1	7.3	21.7	16.4	31.5	11.4
12206	1½ miles NE. of Hixburg.	Gray sandy loam, 0 to 12 inches.	2.1	8.7	7.0	20.9	19.6	28.7	13.1
12207	Subsoil of 12206 .....	Red clay, 12 to 36 inches..	1.4	6.0	4.6	16.6	15.4	20.6	34.9
12209	Subsoil of 12208 .....	Red clay, 10 to 36 inches..	.6	3.7	2.6	7.2	6.9	16.9	61.5

CECIL SAND.

The Cecil sand, to a depth of from 15 to 18 inches, is a gray, light sandy loam of medium texture. The subsoil is a bright yellow sandy clay, reaching to a depth of 30 inches or more. Disseminated through both soil and subsoil are considerable quantities of broken quartz rock, which, however, is not plentiful enough to interfere with cultivation. In the present survey the type does not occur in its most typical form and is found only in small patches, principally in the eastern part of the area near Pamplin City. It is confined to

the uplands and occupies the more level parts of the interstream ridges, and owing both to its location and the open texture of the soil and subsoil it is naturally well drained. The abundance of sand is due to the fact that the soil is derived, in situ, from a highly siliceous mica schist, through which are scattered many small veins of quartz.

The areas occupied by this type are mostly wooded. Where cultivated, fair crops of corn, oats, and wheat are produced. No tobacco was seen growing upon it. The average yield for corn is about 15 bushels, and for wheat about 10 bushels. The oats are fed in sheaf.

The following table gives the results of a mechanical analysis of the fine earth of the Cecil sand:

*Mechanical analysis of Cecil sand.*

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.		Coarse sand, 1 to 0.5 mm.		Medium sand, 0.5 to 0.25 mm.		Fine sand, 0.25 to 0.1 mm.		Very fine sand, 0.1 to 0.05 mm.		Silt, 0.05 to 0.005 mm.		Clay, 0.005 to 0 mm.	
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.				
12202	1 mile N. of Pamplin City.	Gray light sandy loam, 0 to 18 inches.	1.7	9.0	8.5	33.0	16.6	22.5	8.5							
12203	Subsoil of 12202.....	Yellow very sandy clay, 18 to 30 inches.	1.4	7.2	7.2	26.6	12.1	21.0	24.4							

CECIL CLAY.

The soil of the Cecil clay is a red loam or clay loam, ranging in depth from 4 to 8 inches. The subsoil is a stiff, tenacious red clay to a depth of 3 feet or more, with the clay content usually increasing in the lower depths. There is generally considerable quartz or hornblende gneiss strewn upon the surface and mixed with the soil, but these rock fragments do not occur in sufficient quantities to interfere seriously with cultivation.

The Cecil clay, in the present area, occurs principally upon the slopes adjoining the larger streams, but it is also occasionally found upon the divides. Owing to its location it is rolling and in places rather hilly and broken, and for these reasons possesses good natural drainage. Unless the soil is kept in good condition for retaining moisture by deep plowing and by incorporating with it an abundance of organic matter it is apt to be droughty. It also has a tendency to wash badly.

It is a residual soil, derived both from micaceous schist and the hornblende gneiss. Small veins of quartz are found in these rocks, and fragments of the quartz which have resisted the agencies of

weathering are often scattered upon the surface and through both soil and subsoil. The brownish red loamy phase of the type, locally known as "chocolate," or "push land," is the loamy surface material washed from the higher elevations, and consequently is deeper and more loamy than the typical Cecil clay. It is upon an area of this phase of the type about  $3\frac{1}{2}$  miles northeast of West Appomattox that the Bureau of Soils is carrying on tobacco experiments.

This type is regarded as the best soil in the area for general farming. It is especially well adapted to the production of heavy export tobacco, and an excellent quality of plug wrapper, which is not exported, the yields of which range from 500 to 1,500 pounds per acre, depending upon the location, fertilization, and the methods of cultivation. The average yield, however, with the usual methods is about 700 pounds per acre. Wheat grown upon the same land after tobacco yields sometimes as high as 35 bushels per acre, but 20 bushels is about the average in good seasons. The average yield for corn is about 25 bushels. Tobacco and corn are not grown upon the same land. Corn is not fertilized as heavily as tobacco, and consequently the average yield per acre for wheat after corn is only about 12 bushels. When a stand can be obtained, clover does fairly well and is very beneficial to the soil. Cowpeas produce well, but are grown more to improve and enrich the soil than as a forage or fodder crop.

The following table gives the results of mechanical analyses of typical samples of fine earth of both soil and subsoil of the Cecil clay:

*Mechanical analyses of Cecil clay.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			mm.	mm.	0.25 mm.	mm.	0.05 mm.		
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
12210	1 mile N. of Hixburg.	Red loam, 0 to 8 inches...	1.0	5.5	8.8	37.0	8.0	14.9	24.7
12216	Experiment farm ...	Red clay loam, 0 to 7 inches.	.9	3.2	2.7	13.2	25.0	30.0	24.7
12214	Appomattox.....	Red clay loam, 0 to 8 inches.	2.7	7.6	4.9	10.6	9.1	34.8	29.8
12211	Subsoil of 12210.....	Red clay, 8 to 36 inches.	1.4	4.9	6.6	29.2	5.8	12.4	39.6
12217	Subsoil of 12216.....	Red clay, 7 to 36 inches...	.6	1.3	1.1	6.9	11.1	24.4	54.5
12215	Subsoil of 12214.....	Red clay, 8 to 36 inches...	.6	1.7	1.7	4.9	5.3	30.3	55.3

CECIL LOAM.

The soil of the Cecil loam is a grayish or yellowish loam with an average depth of 10 inches, containing 10 to 15 per cent of the coarser grades of sand. There is considerable silt in the soil which, in places, gives it a compact structure. In the wooded areas there is

considerable coarse gravel and siliceous fragments of mica-schist scattered upon the surface. The subsoil is a yellowish or reddish loam or clay loam, usually having an oily feel, which is probably due to the presence of talc and very fine particles of mica. This material changes into decomposed mica and talcose schists at depths varying from 2½ to 6 feet. Throughout both soil and subsoil and often scattered upon the surface are fragments of the underlying schists and quartz, and occasionally upon the crests of hills the underlying rocks come to the surface.

This type of soil is found only in small areas and is confined to the highest parts of the county, ranging from 800 to 1,050 feet above sea level. Its topography is hilly, and the natural drainage good. It is a residual soil derived from impure siliceous mica and talcose schists, which have been more resistant to the agencies of weathering, and hence stand at a greater elevation than the surrounding plateau.

The Cecil loam has never been under cultivation in the present area. It is held in low esteem and has been sold as low as 50 cents an acre. The usual price, however, is about \$2.50 an acre. The type supports a scanty growth of oak, chestnut, and laurel. It is recommended that orcharding be extended to these higher elevations, where it is thought that the fruit trees will suffer less from frost in the spring than they do in many areas where now grown.

The results of mechanical analyses of typical samples of the fine earth of the Cecil loam are shown in the following table:

*Mechanical analyses of Cecil loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to 0.25	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to 0.05	Silt, 0.05 to 0.005	Clay, 0.005 to 0
			mm.	mm.	mm.	mm.	mm.	mm.	mm.
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
12224	4 miles S. of West Appomattox.	Loam, 0 to 12 inches.....	8.1	8.2	2.9	9.7	11.5	40.6	19.1
12226	Pine Mountain .....	Gray loam, 0 to 10 inches.	4.4	5.8	3.4	12.3	11.3	41.4	21.6
12225	Subsoil of 12224 .....	Loam and clay loam, 12 to 40 inches.	9.7	11.2	3.7	12.0	9.4	27.1	26.9
12227	Subsoil of 12226 .....	Loam to clay loam, 10 to 36 inches.	7.8	12.2	4.5	11.1	6.6	25.6	32.1

IREDELL CLAY LOAM.

The soil of the Iredell clay loam is a yellowish-brown to dark-brown loam, with an average depth of about 10 inches. Though usually loamy, in some places it is rather sandy and tends toward a sandy loam. Iron concretions about one-fourth inch in diameter,

locally known as "black gravel," are often strewn upon the surface and incorporated with the soil. Besides these there are often present fragments of quartz and gneiss, locally known as "black rock." The line of demarcation between the soil and subsoil is very distinct. The latter is a sticky, waxy, plastic, impervious, yellow clay, usually free from gravel or rock fragments, and passing gradually into disintegrated hornblende or chloritic gneiss at depths varying from 2½ to 5 feet.

This type occurs in limited areas principally in four localities, viz, in the eastern part of the area between Pamplin City and Hurtsville; in the central part near Appomattox; in the western part 2 miles south of Concord, and north of Concord in the vicinity of Stonewall Creek.

The Iredell clay loam is found typically developed upon the table-lands between the streams and ridges and is conspicuous for its nearly level or gently rolling topography. Where these table-lands pass into higher lying areas of the Cecil clay or the Cecil sandy loam the type is usually hilly and broken, and while the soil still possesses its loamy qualities, the stiff, plastic, impervious characteristics of the subsoil almost entirely disappear, as is the case in the Rocky Hill region, 3 miles north of West Appomattox. In the hilly area the drainage conditions are good, but upon the table-lands, owing both to lack of fall and the character of the subsoil, the drainage is naturally poor, and in such areas artificial drainage would undoubtedly prove beneficial. In the level locations the land is cold and late in the spring, while in a dry season it suffers from drought.

This type is also a residual soil, derived from the weathering of hornblende or chloritic gneiss, and where the latter rock predominates it imparts to the soil a pronounced greenish color. The underlying rock is usually encountered at from 2½ to 5 feet below the surface, and in hilly areas the surface is occasionally so thickly strewn with rock fragments as to interfere with cultivation.

In its present unimproved condition the type is not unusually well adapted to any crop. With careful preparation and proper cultural methods fair crops of corn and oats can be produced. In the most favorable locations tobacco does fairly well. The yield is sometimes satisfactory, but the leaf is coarse and "bony." In the more hilly areas in the rocky phase of the soil winter wheat does fairly well, but upon the flatter area this crop winter kills. From the appearance of apple trees upon the same phase, it would seem that orcharding might be profitably extended.

In the leveler areas the effects of fertilizers are not so lasting as would be expected with such a stiff, impervious subsoil, and crops show scarcely any effect after the first year.

The results of mechanical analyses of typical samples of the fine earth of the Iredell clay loam are shown in the following table:

*Mechanical analyses of Iredell clay loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
12220	‡ mile NW. of Hixburg.	Brown loam, 0 to 10 inches	11.9	9.1	3.0	15.6	23.9	27.9	8.1
12218	2‡ miles NW. of Pamplin City.	Brown loam, 0 to 10 inches	7.6	7.3	2.6	17.9	24.6	28.8	11.2
12221	Subsoil of 12220 .....	Yellow clay, 10 to 36 inches	2.0	2.9	1.9	11.1	10.2	31.7	40.2
12219	Subsoil of 12218 .....	Yellow clay, 10 to 36 inches	1.5	2.8	1.9	10.5	10.7	20.9	51.7

#### MEADOW.

The areas classed as Meadow are composed of such various materials that it is impracticable to give a succinct and definite description of the type. In general, the narrow bottoms are made up quite largely of sand and have either the texture of a sandy loam or a loam, while the wider bottoms are less sandy and the soil is more often a loam or silty loam. There is one phase of the type, locally known as "crawfish land," which occurs in spots too small to be mapped. Here the soil is a loam or sandy loam and is underlain by a "blue pipe-clay," which is quite impervious to water.

The extent of Meadow in this county is less than is usually the case for a Piedmont section. Bottom lands are not found along all of the streams, though only along a few of the larger streams, like the Appomattox River, are there wide areas.

All of the Meadow is flat, or nearly so, and is subject to overflow. In the case of the narrow sandy bottoms there is seldom any difficulty with drainage, but upon the wide bottoms, where the flood waters spread out over larger areas and where sediments are necessarily finer, artificial drainage is necessary. This is usually accomplished by large, deep, open ditches, and sometimes by plowing the fields in narrow lands. In order to protect the bottom land from the wash of the higher adjoining hills, deep ditches leading to the streams are sometimes constructed along the base of the hills. The "crawfishy" spots would be greatly benefited by artificial drainage, but it is doubtful whether expenditures for this purpose would be economical.

The Meadow is still in the process of formation whenever the streams overflow their channels. Some of the streams are still rap-

idly eroding their channels, and hence their courses are too narrow and their currents too swift to favor the accumulation of sediments.

Valuable Meadow areas have been greatly damaged along the Appomattox River during the last few years by erosion during freshets.

The Meadow is regarded as the best land in the area for corn, and the opinion prevails that farms which have no areas of Meadow are not the most desirable. The average yield per acre for corn is from 50 to 60 bushels, and much larger yields are not uncommon. It is also excellently adapted to grass and pasture, but is little used for such purpose because of its demand for the production of corn. Large yields of tobacco can also be produced on this soil, but the texture is usually too coarse, and this crop is not grown except in a few of the more sandy areas. The "crawfishy" spots are not usually desirable for any crop or for pasture.

#### AGRICULTURAL METHODS.

The war left the farmers with so little capital and controllable labor that large areas of cleared land were "turned out" to be subject to severe washing and to grow up with old-field pine, and while this led necessarily to the cultivation of smaller areas better methods of cultivation did not immediately follow.

Aside from the attempt to cultivate too much land, a decided hindrance to success has been the use of wasteful methods and a lack of thoroughness in the preparation and cultivation of the soil; and some large plantation owners have trusted the cultivation of their lands entirely to tenants, a practice that almost always leads to soil exhaustion.

In the case of tobacco, for example, many farmers do not plow the land until spring, and then the plowing is shallow, and the tobacco is planted upon ridges. On the other hand, the cultivation throughout the season is deep, which tends to break up the root system and to injure the plants. A much better plan, and the one pursued and recommended by the Bureau of Soils in its experiments on the farm  $3\frac{1}{2}$  miles northeast of West Appomattox, is to plow the land to a depth of 6 or 8 inches in the fall, great care being taken not to plow when the ground is wet, thus avoiding baking and clodding, and immediately after plowing to sow some winter cover crop, like rye, which is harrowed in lightly. This not only allows the ground to get the benefit of frost action in fining and mellowing the soil during the winter, but the rye serves the double purpose of keeping washing in check during winter rains and of adding humus to the soil for the next crop. The rye is turned under in the spring when it is about 6 inches high, and the ground is thoroughly pulverized with a disk

harrow. The first cultivation of the tobacco is deep, so as to thoroughly loosen up the ground, but thereafter all cultivations, which follow at intervals of one week apart until the plants are ready to top, are shallow enough to avoid breaking the roots and retarding the development of the plants.

Home mixed fertilizers are recommended, and a heavy application of these is advised. But the details of this work may be learned by those interested in the area by visiting the farm referred to, or later when they will be given in published form. It may be mentioned, however, that the first experimental crop has shown that the average yield of 600 pounds per acre may be increased to 1,300 pounds, and that while the first expense of fertilizers is rather heavy, the increased yield of other crops in the rotation will more than make up for it.

The scanty application of barnyard manure, coupled with a continual growth of clean cultivated crops, has so reduced the humus content of the soils of the county that many originally fine farms have been "worn out"—i. e., become unprofitable to cultivate under the present methods. All unoccupied lands should be protected from the washing of winter rains by some cover crop like rye or vetch. Cowpeas should be grown extensively upon all of the types. They may be plowed under or cut for hay, provided the latter is returned to the soil later as manure. The roots of the peas not only add nitrogen to the soil, but change its mechanical condition by making it more loamy.

Within the areas of Cecil clay there are often small shallow, hard, compact areas locally known as "gall spots." After a few hours of rain they become a mire, and in dry weather they get as hard as a brick. These "gall spots" are unproductive, because there is no organic matter in the soil and their water holding capacity is very small. By growing cowpeas and winter cover crops for a few years they may be made mellow, loamy, and productive.

The farmers of the county raise too little of the necessaries of life. Every farmer can and should raise hogs and sheep and sell bacon, hams, mutton, and wool. There is a great demand for good mules and horses. These and some cattle should be raised upon every farm. The advisability of keeping more stock is strongly urged, not only because of the value of stable manure, but also because of the beneficial effects of pasturing the land. All land of the area when "turned out" reverts to its original condition if it is not pastured. It should be kept in mind, however, that it is not advisable to pasture seeded land until after the second year, because the tramping of stock is very injurious both to the land and the young plants. Care should also be taken not to turn the stock upon the land when it is very wet.

## AGRICULTURAL CONDITIONS.

Since the war the lands have fallen largely into the possession of those who were formerly working people. These were the ones under the changed conditions best fitted to develop the resources of the region.

The narrowness of the "bottom" lands has limited the corn and hay growing capacity of the area and necessitated to some extent the importation of these products. The extensiveness of the "thin" phase of the Cecil sandy loam has also been a drawback, and owing to the difficulty of getting a stand of timothy and clover the region is deficient in stock, and hence also deficient in barnyard manure, which is needed to maintain the productivity of the soils. The practice of manuring so largely with doubtful brands of commercial fertilizers bought upon credit, together with the practice of buying home supplies upon credit at prices fixed to include an exorbitant rate of interest, has also done much to retard the prosperity of the farming class. The credit system is the natural outgrowth of one-crop farming and the lack of diversification. No one thing is needed more in this area than a greater diversification in farm crops.

Despite the conditions just described, there are good opportunities for those who use judgment in selecting farms and who are willing to do their own work. Some of the tenant class who learned from actual experience how to grow and cure tobacco have been known to purchase and pay for a farm in two years. Those who have used good judgment in selecting farms, have managed them with a view of keeping the soil in the best condition, and have not purchased supplies upon credit are generally prosperous.

There are indications that the area is entering upon an era of greater prosperity. Very few farms are mortgaged, the natural conservatism of the people is disappearing, and more attention is being paid to agricultural methods approved by modern experience. The value of green manuring crops, for instance, is more thoroughly appreciated. The public schools are being improved. There is more of a spirit of cooperation among the farmers, and the rural free delivery is bringing them in closer touch with the rest of the world.

About 60 per cent of the farms are operated by the owners, about 25 per cent by share tenants, and the remainder by cash tenants and part owners. In renting, the usual custom is for the owner to furnish the tools, teams, and feed, and half of the fertilizer, receiving in return half of the crops grown.

The farms range in size from a few to 1,000 or more acres, with an average of about 150 acres. At present there is a tendency toward increased acreage, caused by the more prosperous farmers buying

adjoining lands, not so much with a view of increasing their area under cultivation as for investment. Some of the colored people are small land owners, the size of their farms usually ranging from 10 to 35 acres, while a few have holdings as large as 150 acres.

The usual size of the farms throughout the area is too large, but can not be greatly decreased without an increase in population. Probably not more than 25 per cent of the area is at present under cultivation. There is very little of the original timber in the region, however, the black oak and chestnut oak having been removed years ago for tan bark, and the post oak, in recent years, for cross-ties. The wooded areas at present consist mostly of black-jack and other oaks, second-growth pine, chestnut, and hickory.

Land values range from \$2.50 to \$20 an acre, the average for fair farming lands being about \$10. The abundance of cheap land is attracting farmers from the North and West. Those newcomers of limited means who are not acquainted with the conditions and methods in use would do well not to attempt farming upon their own account at once. The history of such attempts is mostly one of discouragements and failures, which might be avoided if intending settlers would work for a year or so with an experienced farmer; for no matter how poor his methods appear the native farmer is apt to know more of the conditions and how best to meet them than a stranger can possibly know. The latter, however, may soon learn to improve upon those methods after he has become acquainted with the seasonal changes, the best time of planting, and other elementary questions connected with the local industries. An ideal farm for the region is one that has an abundance of Cecil clay upon the uplands for growing tobacco and grain and sufficient bottom land to grow corn and hay for home use.

Until about a decade ago the colored people constituted about half of the laborers of the area. During the past few years there has been a great scarcity of negro labor, owing to the fact that the most efficient have gone to the near-by coal fields, where better wages are paid. The majority of those remaining are either the less skillful laborers or those owning small farms and not obliged to work for others. Efficient farm hands have become all the more scarce in recent years because many of the industrious white class who were formerly laborers now have property of their own.

The lack of labor is largely responsible for the small proportion of land under cultivation in the county. It appears that if the agricultural possibilities are to be fully developed some kind of labor, foreign or domestic, must be induced to come into the county, and before the most desirable class of labor can be attracted the wages paid in other parts of the country must be more nearly approximated.

The present low wages not only exclude the best laborers, but tend to discourage the laborer home-seeker. The only solution of the problem lies in establishing a diversified system of farming, instead of depending almost entirely upon one crop as a source of revenue. In this way money will be coming in at different times of the year; more money will be in circulation; there will be greater prosperity, and better wages can be paid.

Tobacco has been the chief product for many years and is at present practically the only money crop of the area. An excellent variety of export and dark plug wrappers is at present the only tobacco grown. It is cured in barns over fires usually made of green oak, chestnut, or hickory, and the results obtained, as well as the prices received, depend in a large measure upon climatic conditions and the skill of the growers, some of whom seem to have far greater success than others under similar conditions.

Winter wheat was formerly grown quite extensively and considerable quantities were shipped, but competition with grain grown in the Northwest has resulted in a reduction of the acreage, until now scarcely enough is grown to supply the local demands. Corn and oats are among the principal products and good yields are obtainable, but not enough of these crops is grown in the area to supply its demands. Clovers, with timothy or herd's-grass, are grown for hay, but the great difficulty of getting a satisfactory stand makes them unpopular with many. Large quantities of feed are shipped in annually to supplement the production of hay and corn. Vegetables and potatoes are grown, but scarcely enough to supply the home needs. Several varieties of apples, good in keeping qualities, color, and size, are grown by a few and sold at a profit.

The crops of the area are well adapted to the soil types upon which they are grown. The Cecil clay is especially adapted to a good dark leaf tobacco suited for plug wrappers, and it also produces an excellent quality of export tobacco, as well as good yields of wheat and corn. It is the only type in the area upon which clover makes a satisfactory stand, and it should be used more extensively for this and other leguminous forage crops.

The deeper phase of Cecil sandy loam, when properly handled, produces a fair quality of heavy export tobacco, and it will also produce a bright tobacco; but as the near-by markets do not demand the latter type, none is grown. In general, it may be said that the tobacco grown upon Cecil sandy loam is a thinner leaf, with coarser fiber than that grown upon Cecil clay. Wheat and corn are grown upon this soil, but the yields are naturally smaller than upon the Cecil clay. Fair yields of oats are secured upon both the Cecil clay and Cecil sandy loam.

Iredell clay loam is not well adapted to growing tobacco, because it produces too "bony" a leaf. Owing to the usual impervious nature of its subsoil, it "heaves" in the winter and hence is not adapted to wheat. The yields for corn and oats are usually fairly satisfactory, and the type is used mostly for these crops and also for pasture. The few "black rock" outcrops associated with this type are more loamy and better adapted to all crops, and especially to apples.

Meadow is the best type in the area for corn, and adjoining the hills, where the type is inclined to be more loamy, it often produces an excellent heavy export tobacco. Small experimental patches of nonsaccharine sorghum were seen growing in such a way that an extension of these experiments is advised upon the type.

Cowpeas and vetches are well adapted to all types of the area, and too much stress can not be laid upon the advisability of growing them, both as forage and green manuring crops. The vetch is an excellent winter cover crop. Brome grass and herd's-grass are the native grasses of the region. Clover and timothy are unsatisfactory because they are short lived. Vegetables and potatoes do well upon any of the types. With the greatest care and attention and in the most favored locations apples may be grown with profit. All the soil types are adapted to a greater diversification than is at present practiced, and the general lack of prosperity throughout the area is due primarily to this lack of diversification and the placing of too much dependence upon one crop.

Tobacco, practically the only crop marketed, is sold at Lynchburg or Farmville. All of that grown in the western half of the county and the greater part of that of the eastern half is hauled by wagons to Lynchburg, about 16 miles west of the area. The tobacco is sold at public auction by the farmer direct to the representatives of domestic and foreign manufacturers. The farmer pays a commission to the warehouse for the privilege of putting his tobacco upon the floor and of having an auctioneer. The tobacco goes to Germany, England, Austria, Italy, and Spain. The higher grades are used in the United States for plug wrappers.

There are no cities within the area. West Appomattox, the county seat and largest town, has a population of less than 200. All small stations along the railroads are shipping points for cross-ties, tan bark, lumber, and other forest products.

Good transportation facilities are afforded by the Norfolk and Western Railway, which crosses the southern half of the county. The Chesapeake and Ohio, which runs along the northern side of the James River, affords shipping points for the northern part of the area.

The public highways usually follow ridges, but often cross deep valleys on steep grades that might have been avoided if the roads had been laid out to follow the streams. During the summer and fall the roads usually wear down and pack, so that, barring occasional rocky stretches, they make good smooth-surfaced highways. In the midwinter and early spring months the highways usually become so sticky and cut up by travel that they are well-nigh impassable.

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