SOIL SURVEY OF HANCOCK COUNTY, GEORGIA.

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DESCRIPTION OF THE AREA.

Hancock County, Ga., is located in that part of the State known as "Middle Georgia." It is bounded by Taliaferro County on the north, by Warren and Glascock counties on the northeast and east, by Washington County on the southeast, by Baldwin County on the southwest, by Putnam County on the west, and by Greene County on the northwest. It is separated from Warren County by the Ogeechee River and from Putnam County by the Oconee, both rivers being of inconsiderable size in this locality, though becoming important streams before reaching their respective outlets.

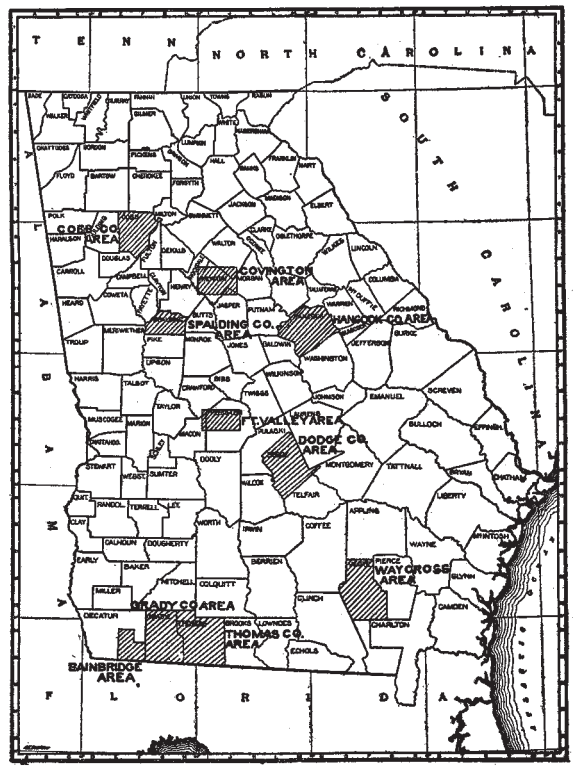

FIG. 19.—Sketch map showing location of the Hancock County area, Georgia.

The county lies between parallels 32° 57′ and 33° 21′ north latitude and meridians 82° 44′ and 83° 16′ longitude west from Greenwich. It is of irregular shape, having an extreme length from east to west of about 31½ miles and measuring some 23 miles from north to south, covering an area of 339,200 acres or 530 square miles.

This entire section of the State was first settled and opened up prior to the War for Independence, the pioneers being the descendants of those of "the best people among the needy population of

England," who comprised the settlers brought to Savannah by Oglethorpe early in the eighteenth century. Later many persons moved to this section from Virginia and the Carolinas, and at the present time there are to be found many family names in Hancock County familiar in those States. Chiefly of English and Scotch stock, the settlers of this region brought into it a strong religious feeling that has continued up to the present time. From the earliest times they paid the greatest attention to the cause of education and established schools and academies. Some of these institutions continued in existence for many years, and in some instances achieved more than a local reputation. Supported by such traditions, the present public-school system has reached a high standard.

Hancock County was organized in 1793 and was named in honor of John Hancock, of Pennsylvania, and is one of a number of counties organized about this time.

The larger part of the county is hilly and rolling, with the characteristic red soils of the Piedmont Plateau, within which about seven-eighths of the county lies. The "fall line" separating the Piedmont Plateau from the Coastal Plain passes through the county in an irregular course from east to west, slightly north of its southern boundary. In the Coastal Plain portion the surface becomes less rolling and the soils more sandy. In no place in the county, however, do its physical features take on the rough and rugged character so frequently observed in the Piedmont; nor do they assume the typical Coastal Plain aspect.

The county has two separate and distinct drainage systems, the divide extending from northeast to southwest. One is toward the Oconee River on the west by means of Buffalo, Shoulderbone, and Town creeks, and their branches, the waters of that river reaching the sea after its confluence with the Altamaha. The other comprises the small streams flowing into the Ogeechee River, which reaches the ocean at Ossabaw Sound. None of the streams of the county are important in size or character, though sufficient power to run small mills and cotton gins has been developed in some instances. At the present time, however, this source of power is being rapidly displaced by steam.

The general elevation of the county approximates 500 feet above sea level, with a slight increase toward the northern portion, the altitude of Sparta, located a short distance northeast of the center of the county, being 581.8 feet, that of Carrs Station, 12 miles west, and Mayfield, 11 miles east of Sparta, being 522 and 417.5 feet, respectively. These places are all located on the Georgia Railroad, which crosses the county about midway between the northern and southern extremities in a northeasterly and southwesterly direction. It is at present the only railroad in the county. A line running south

from Sparta to Sandersville, connecting with points on the Central of Georgia system, has been projected, but not yet completed.

Sparta, the county seat, with a population of 1,150, according to the census of 1900, is the only town of importance within the county. It is the chief local market and shipping point for much of the produce, and from here also are distributed most of the supplies used on the plantations. It is well provided with churches, schools, stores, banks, and has such modern conveniences as electric lights and telephone service. It is distant by rail 54 miles from Macon and 148 miles from Atlanta.

Hancock County possesses a well-devised system of roads, which, radiating from Sparta as the center, afford easy access to all parts of the county. These roads, although of the ordinary dirt-road type, have in most instances been laid out along the ridges, thus avoiding as far as possible very heavy grades and reducing to a minimum damage by washing. The recent introduction of the system of utilizing convict labor on the roads will undoubtedly prove beneficial to the agricultural interests, not only in this county, but throughout the entire State. At present much improvement has resulted, though the system has been in vogue but a short time. Roads have been widened, culverts built, grades reduced, and in a county where stone is as abundant as it is in Hancock County, a few years should see many miles of paved roads, good in all conditions of weather, where now only dirt roads exist. Dependent as they are on a single line of railroad, and having to haul products in some cases many miles to reach a shipping point, the construction of additional roads and the improvement of existing ones is a matter of the utmost importance to the farmers of this county.

Granite of good quality is abundant throughout the county and several quarries are in active operation in the vicinity of Sparta, from which place eastward for about 11 miles and southeastward for about 8 miles rock outcrop and bowlder masses of this material constantly occur. Many areas of considerable extent, thickly strewn with granite bowlders of very large size, occur in the northern and northeastern portions of the county. Deposits of agate, asbestos, and kaolin are also found, the vein of the latter near Carrs Station being very extensive and quite pure.

The original forests were largely composed of the longleaf and the shortleaf pines. Nearly all of these at this time have been cut for timber or killed to accomplish the extension of the cultivated areas. Hardwoods, chiefly oaks and hickory, are found in the northern part of the county. Along the stream courses and in those localities where indifferent drainage conditions are to be found, magnolia, dogwood, gums, and other moisture-loving species abound.

CLIMATE.

The climate of Hancock County is mild and pleasant throughout most of the year. With the exception of brief periods of low temperature, the winters are mild. Snow falls occasionally, but soon melts. The summers are warm but not oppressive. The annual precipitation is over 50 inches, and is well distributed throughout the seasons, though the rainfall is usually less in autumn than in the winter or spring months. Sufficient rain usually falls during the summer to prevent prolonged droughts.

The appended table is compiled from the records of the Weather Bureau station at Harrison, Washington County, Ga., there being no station in Hancock County. While Harrison is located some 30 miles south of Sparta and has less than half the elevation of that place, these records may be taken to represent approximately the average temperature and precipitation of much of this section, including Hancock County.

Normal monthly, seasonal, and annual temperature and precipitation at Harrison, Washington County, Ga.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
December	46	74	10	3.4	3.0	2.0	1.1
January	46	73	12	3.2	5.7	4.2	0.5
February	47	80	−2	6.0	6.4	5.6	2.5
Winter	46			12.6	15.1	11.8	4.1
March	57	86	18	5.4	2.9	6.3	0.0
April	61	91	30	2.9	2.6	3.5	0.0
May	73	96	45	3.4	1.7	5.4	0.0
Spring	64			11.7	7.2	15.2	0.0
June	79	102	52	5.8	2.2	10.2	0.0
July	81	103	56	4.6	3.8	3.6	0.0
August	81	101	63	7.9	6.0	4.9	0.0
Summer	80			18.3	12.0	18.7	0.0
September	75	96	40	2.6	0.4	4.2	0.0
October	65	90	32	3.1	4.0	2.9	0.0
November	55	82	20	3.1	1.4	3.6	0.0
Fall	65			8.8	5.8	10.7	0.0
Year	64	103	−2	51.4	40.1	56.4	4.1

AGRICULTURE.

The agriculture of Hancock County is of the same general character as that found throughout the cotton belt. According to the Twelfth Census there are 243,470 acres in farms, of which 133,507 acres are classed as improved lands, having a total value, including buildings, machinery, and farm implements, of $1,628,360. The value of farm products, including those fed to stock, amount to $926,894. To obtain these products there was spent in 1899 the sum of $69,480 for labor and $53,540 for fertilizers.

About one-third of the entire improved farm acreage, or 45,204 acres, was reported as being planted in cotton, and a little over one-fourth, or 33,599 acres, was reported in corn. The production of cotton on this area was 14,827 bales and of corn 261,540 bushels, an average per acre of about one-third bale of cotton and 7 bushels of corn. In oats, 4,578 acres were reported, the average production being about 11 bushels per acre, and 3,436 acres of wheat gave an average of less than 6 bushels per acre.

The average size of the farms in Hancock County is given as 109.9[a] acres. Twenty per cent of the farms are operated by the owners, the remainder being rented to tenants either on a share basis or at a fixed rental, the latter plan being more usual. In these latter cases the rent is paid in cotton on a basis of a specified number of bales to the "plow;" that is, the number of acres cultivated. As a rule but one horse or mule is used in plowing throughout this section, and from this circumstance has arisen the term "one-horse" or "two-horse" farm. The acreage of the "plow" varies according to the quality of the land and consists of as many acres as the tenant is considered able to work with the equipment he possesses. This system has its advantages, and when the characteristic racial traits of the great majority of the tenants are taken into consideration, it is readily seen that it is far more advantageous to both parties than a share tenancy. While it is in a measure an insurance against loss to the landlord, it is also an incentive to the tenant to exert his utmost endeavors to get as large a crop as possible. Nevertheless, it has resulted in the devotion of too great an acreage to cotton to the exclusion of all other crops, and is far from being conducive to the development of a diversified system of agriculture. By the introduction of diversified agriculture, whereby the farms would be rendered self-supporting and cotton would become the money crop instead of the single production, the general condition of both landlord and tenant would be improved. Such a system would tend to build up rather than to run down the lands, and the landlord would

[a] The census reported each tenancy as a separate farm. The average size of individual holdings is doubtless considerably larger than the figure stated.

be amply justified in demanding a proportional increase in rent for lands of greater productiveness, and the tenant, raising much that he now purchases, would have from his own portion of the cotton, after paying his rent, sufficient remuneration for his year's labor; moreover, the money that now goes out of the county, and eventually much of it out of the State, to pay for products that could easily be produced on the farms, would remain at home, adding to the general wealth and prosperity of the farming class.

One of the most serious problems which the farmers in this county have to meet is that arising from the washing of the soils. So much of the country being rolling and hilly, with but a very small proportion level, practically all the land is subject to more or less damage from this cause. A common sight, not only in this county, but throughout the entire region, is the gullied and corrugated hillsides from which the once fertile soil has been removed by erosion. The nature of the soils of this section render them susceptible to injury from this cause, and the cultural methods in vogue are calculated to increase rather than diminish the danger of damage.

Clean cultivation of both cotton and corn is necessary to insure the best results, but with such culture should be combined a system of controlling the flow of the surface water to prevent to the fullest extent any damage to the land. Formerly reliance was placed in the hillside ditch. Based upon the theory that by collecting the water at intervals, and converting it into rivulets, which were led by gravity into the near-by creeks, the surfaces between the ditches would be amply protected. In practice, however, in the course of time the reverse was found to be true. To be at all effective a sufficient grade had to be given the ditches to enable the water to flow freely through them. The force of the confined water became greatly augmented before the point of outlet, resulting in the deepening and widening of the ditches, thus reducing the area between them until in some cases there was scarcely enough land to warrant cultivation. This system laid the foundation for much of the soil destruction that has taken place in this region, and the continued neglect of abandoned fields in which the ditches were constructed is a powerful agent for its continuation.

At the present time terracing is relied upon to prevent erosion, and when properly laid out and constructed the terrace has proved itself very effective in accomplishing this end. When, however, the terrace is improperly designed or constructed it simply serves as a dam to hold back the water instead of distributing it over a wide area with decreased force. Frequently the water when held back by an improperly arranged terrace accumulates on the upper side. Here it is held until the terrace, weakened by seepage or deficient because of faulty original construction, gives way under the strain. The vol-

ume of water thus confined pours through the break and dashes down the slope with increasing force until checked by the next terrace. This soon gives way under the increased strain and the process is repeated to the bottom of the slope, leaving a trail of demolished terraces and beginning the never-ending work of destructive erosion. Terraces constructed with even a slight fall or in the form of a bank with a furrow thrown on the upper side are in reality but badly constructed hillside ditches, and are entirely inconsistent with the vital principles upon which the theory of terracing is founded.

The theory of terracing, well sustained by years of practical experience, is that when properly laid out and constructed the terrace prevents the water which falls upon the land, in excess of that which soaks into the soil, from collecting in rivulets, causing it to spread and flow over the surface in a sheet. The velocity of the moving water is thus reduced below a point capable of damage.

To perform properly its mission, therefore, the terrace must be perfectly level, following the contours of the slopes which it is designed to protect. With the unaided eye it is practically impossible to lay out a system of terraces that will be level, and as the efficiency of the terrace depends almost entirely upon this feature, the use of an instrument for this purpose is a necessity. Many specially designed levels for this purpose are now on the market, all being sufficiently accurate for the purpose as well as being inexpensive.

When necessary to construct a system of terraces it should be borne in mind that when completed it will be a fixture, designed for the permanent improvement of the land, and the greatest care should be taken to insure the proper design and construction. To insure the best results, the terrace should be low, broad, and flat, rather than high and peaked, and as a means of protection it is well to encourage the growth of a permanent grass crop upon it rather than to allow it to become covered with brambles, weeds, and briers. If terraces are laid out in the fall, it is well to protect them during the winter by sowing to rye or other similar crop, the roots of which will serve to hold the soil in place until a permanent growth of grasses is secured. If laid out in the spring, however, they can be sown at once to whatever grass is intended to be used for a permanent covering. The vertical distance between the terraces should not be over 3 or 4 feet, and by the use of hillside plows, throwing all furrows downhill, the cultivated surface is gradually leveled.

Often one of the disadvantages of terracing lies in the loss of a considerable proportion of the land to cultivation. While this is of course unavoidable, if the embankments are set to some good permanent grass, suitable for mowing, the hay produced will fully offset this loss. Moreover, a terraced field is capable of being given more thorough and careful preparation than the plain hillside, and

the increased production will more than compensate for the loss of area occupied by the terrace lines. Again, such humus-forming material as may be introduced will also tend to remain in place during the period required for its decomposition, and its presence in the soil will greatly assist in reducing the tendency to wash. This is also true of a deepening of the plowed surface, though care must be exercised to increase the depth gradually.

Cotton is the leading crop of the county, the annual production approaching 15,000 bales. The average yield per acre is between one-third and one-fourth bale, though there are instances of as much as 1,200 pounds of seed cotton being produced upon a single acre, with 2,800 pounds as the highest yield recorded. Of course such yields as the latter are only to be obtained through a fortunate combination of circumstances, variety, soil, climate, and season all being favorable and all aided by the most careful and diligent attention in the preparation of the land and subsequent cultivation of the crop, and while such a yield may be and undoubtedly is far beyond the capabilities of the average farmer on average land, even with the variety best suited to the soil type, nevertheless the fact that such a yield could be obtained under any circumstances is valuable as showing that no one interested in cotton culture should allow himself to be content with such yields as are at present obtained. There can be no doubt that the adoption of more intensive methods of producing cotton would be followed by a substantial increase in production per acre, which could be accompanied by a corresponding decrease in cotton acreage, and thus afford an opportunity to diversify the agricultural industries of this section, without in any way jeopardizing the important position of cotton as the leading product or money crop.

At present no attention appears to be given to the selection of seed for planting, the usual custom being to obtain at the gin the supply needed for the coming year at the time the present crop is being prepared for market. Repeated experiments have demonstrated the value of seed selection in all crops, and of course there is no reason to think that cotton should be an exception to this well-established rule. In many cases it has been shown that certain varieties do better on a general soil type, and it would be highly profitable for the growers of this county to take steps toward securing the introduction of such varieties as are best adapted to their conditions. Seed selection can, however, be practiced by every individual engaged in cotton production, and it is not at all a difficult task to secure by this means a strain markedly adapted to the special conditions under which it is to be grown. Frequently too little attention is given crop rotation, cotton following cotton year after year, or alternating with corn. The clean cultivation necessarily bestowed

upon both these crops for successive generations has deprived the soil of practically all of its humus content, and has thereby materially reduced its ability to support and mature a properly remunerative crop, even with the assistance of commercial fertilizers. The remains of former corn and cotton crops, stalks, roots, etc., constitute an entirely inadequate supply of organic matter for conversion into humus, the decrease of which is perhaps the most important factor in the declining yields of the cultivated soils of any section.

The presence of a sufficient amount of humus in any soil renders it more easily tilled. It prevents clay soils from becoming too compact by inducing a granular condition and obstructing the formation of clods. Such a granular condition of the soil enables it to hold a larger amount of available water, and this aids the crop to withstand droughts better. As a rule soils that are well supplied with humus have more plant food in an available condition than do those not so well supplied. The rock minerals of the soil contain no nitrogen, but the nitrogen of the decaying humus is readily available for the use of the crop, while the acids formed by it during the processes of decay act upon the mineral constituents of the soil, assisting in dissolving and otherwise changing them and making their store of plant foods more available to the growing crops. It is thus readily seen that even though a strict alternation of corn and cotton is practiced the results are in no ways comparable to those where the system includes a crop of small grain and grass, occupying the land practically two years out of every four.

Under existing circumstances the only feasible way of effecting a permanent improvement of these lands is by the use of green manures, and it is safe to say that the introduction of this practice will not only be followed by an increase in present crop yields but also by a permanent improvement of the land. For this purpose leguminous crops should be grown, plowing under the entire crop. The clovers, cowpeas, and vetches are admirably suited to the local soil and climatic conditions. Especially is this practice to be recommended for this section, because of the fewness of the farm animals, producing as they do an amount of manure grossly inadequate to supply the deficiency of organic matter in the soil. The census of 1900 shows that in Hancock County there were 6,590 head of cattle, 3,628 horses and mules, 484 sheep, and 11,262 swine of all ages, making a total of 21,964 domestic animals on the farms of the county. These animals, it must be remembered, are divided among 2,183 farms, or an average of 10 animals to the farm. The average size of the farm is given as 109.9 acres, showing an animal to every 10 acres. In this calculation are included animals of all ages in each class. If it were possible to apply the product of all these animals alone to the lands classed as improved lands, comprising a total area

of 133,507 acres, it would be equivalent to applying the product of each individual to something over 6 acres, giving to each acre an amount too small even to suppose that it would be of the least benefit. Yet in point of fact not even this small amount is or can be applied. Moreover, the manure thus made is seldom properly cared for, being allowed to lie out in the weather and leach until its value is practically gone before it is applied to the ground.

In the selection of a crop for green manuring or for soil improvement the legumes at once suggest themselves as being the most desirable for the purpose in every way, though rye sowed in the fall and plowed under in the spring is admirably adapted for this purpose, forming as it does a cover crop capable of protecting the land from washing during the winter, and serving as a good green manure if plowed under in the spring before the straw is so far developed as to become too resistant to rapid decay. In conjunction with the use of green manures the application of lime is to be recommended on the soils of this section, both of a clayey and of a sandy nature, not only on account of its chemical action in connection with the decomposition of the organic matter but also by reason of its well-known effect on the physical condition of the soils.

The introduction of disk plows, seen at work in various parts of the county, gives promise of deeper and more thorough preparation of the soil. This implement seems to be particularly well suited to the needs of the clay and sandy loam soils of this section, insuring as it does a sufficiently deep preparation of the soil, while bringing to the surface only a minimum quantity of the unweathered subsoil. Such preparation, taken in connection with the necessary steps for the restoration or maintenance of the organic content of the soil, will do much toward the permanent improvement of the soils as well as tend to increase their present productiveness.

The cost of production of individual farm crops must be computed on the basis of the acreage under cultivation; therefore if the productiveness per acre is increased it follows that a corresponding decrease in the cost per unit of the crop produced has been effected. Such improvement in the productivity of the soils as may be reasonably expected to follow their better preparation and an increase in their organic content would also tend to decrease the amounts annually paid out in cash for fertilizers, thereby cheapening by the amount thus saved the cost of production of the crops.

As is general throughout the South, corn forms one of the chief staples, the acreage devoted to its culture being exceeded only by that of cotton. It is grown on all types of the soil, receiving in many instances much less care and attention than so important a crop deserves. Under the ordinary system of cultivation the average yield is reported to be about 7 bushels per acre. As a rule no fer-

tilizer is applied to corn, and it is very doubtful, in view of the climatic conditions of this section, if it derives any benefit from that applied to the preceding cotton crop. In view of the fact that the consumption of corn is in excess of the production, thus necessitating the purchase by the farmers of the county of many bushels annually, the production of this crop could be materially and profitably increased. Not only should the acreage devoted to corn be increased, but so important a crop as this in the system of farm economics in this section deserves far more attention in its cultivation than it usually receives.

The yield as at present reported can no doubt be increased substantially by a deeper and better preparation of the corn land and by the judicious use of fertilizers, and there is no doubt that the increased yields would amply repay the cost of the additional labor necessary as well as the outlay for fertilizers. Moreover, an increased amount of fodder would be secured for the sustenance of the farm animals, thus doing away with the necessity for the purchase of much of the forage at present bought by the farmers.

In the preparation of corn land, as in the case when cotton is to be planted, the disk plow appears to be an implement especially well adapted for use on the soils of this section, and a few years of deeper plowing, attended by the use of green manuring crops, will undoubtedly result in putting the land in such a condition that a profitable increase in yield will follow. Moreover, as has been pointed out, the improvement following the restoration of the humus-forming material to the soils will be of permanent benefit and render more effective the applications of fertilizers customarily used.

Wheat is at present but little grown in this county, although it formerly was a staple product. The Cecil clay loam and much of the Cecil sandy loam are well adapted to its growth. The introduction of a system of rotation with this crop as one of the members would no doubt be advantageous in many cases. The growing crop would afford protection to the land during the winter months, when the danger from washing is greatest, and the stubble when plowed under would be a source of humus. Rye could be used as a step in the rotations and would be quite valuable as a cover crop and as means of improving the soil. At present the yields of both wheat and rye are probably less than 6 bushels per acre, and but comparatively few acres of either are grown.

Oats are grown on a large area of the county, but in small patches. The yield is about 11 bushels per acre. Both fall and spring planting are practiced, the chief objection to the former being liability to freeze. This could be largely overcome by a deeper preparation of the seed bed and by planting in time to allow for the development of a good root system before the setting in of winter weather.

Moreover, this plan would afford a protective covering for the land, quite as good as that given by wheat or rye, and having this in view the selection of a variety which stools to a certain extent is to be recommended. As is the case with corn, not nearly enough of this crop is grown to supply the farm demand and large quantities are brought in annually to feed stock used almost exclusively in cotton production. Thus, much of the earnings of the cotton crop go to pay freight and other charges on a product that should by all means be raised at home.

But little grass is cultivated in the county, though crab-grass and Bermuda grass, both good hay grasses, would find highly suitable soils and climate. Such small areas as are devoted to pasturage give every evidence that their cultivation could be profitably carried on. The Cecil clay loam is well adapted to the production of grass crops, and a good hay field could be developed upon practically every farm in the county. The annual consumption of western hay reduces the profit from cotton, the money crop of the section, a very large amount every year.

Peaches are grown in various sections of this county, and there are some extensive orchards of thrifty appearance which give evidence of having received proper care, and which are no doubt very profitable to their owners. In some cases, however, where insufficient attention has been paid to the selection of soil and site suitable for peach culture, the venture has proved unsuccessful, and orchards have been practically abandoned.

Too much emphasis can not be placed upon the necessity of exercising the utmost care in selecting orchard sites and in giving the young orchard the care and attention it deserves. In this county the soils and climatic conditions are on the whole very favorable to peach growing, and there is no reason why the industry should not be greatly extended. The chief drawback has been and is now the damage done by scale, but this source of danger is no more formidable here than elsewhere, and can be guarded against by the methods employed in other localities.

The selection of the orchard site is of the utmost importance, and success or failure is often the result of selecting a site where exposure, elevation, and character of soil are or are not suited to the use to which the piece of land is to be put.

It is now well recognized that land to be used for orcharding ought to be somewhat elevated above the surrounding lands in order to have better air drainage, or circulation. Such conditions mean less liability to damage by frost in spring and less injury to the trees in winter. The freer circulation of air thus obtained is also an aid in the even ripening of the fruit and is a preventive of rot. At the same time the site chosen should not be such that the trees are ex-

posed to strong winds, if such prevail, for considerable periods of the year.

The adaptability of any soil to peach growing may be said to depend in a measure upon the character of the subsoil. While the peach succeeds on a variety of soils, the type best adapted to this fruit in this locality is the Cecil sandy loam when well drained and of moderate depth. Much depends upon the character and condition of the subsoil, which if suitable allows much variation in the surface soil. It is also a matter of common observation that the fruit from trees grown where there is a red sandy clay subsoil has a better color, being more attractive and salable—points of considerable importance in the conduct of a commercial orchard.

The soil should be moderately deep, and if sandy should rest on a compact clay subsoil, which while porous and well drained will nevertheless hold sufficient moisture to supply the needs of the tree. Deep sandy soils with sandy subsoils usually result in crops of uniformly poor quality and a short-lived tree. When the subsoil is a stiff impervious clay the result is an excess of moisture with a consequent lack of aeration about the roots, and trees seldom do well when such conditions are present, regardless of the character of the surface soil. It is said also that peach yellows is more apt to prevail when such conditions are found than where the subsoil is of a more open character. The gravelly soils of this county, where the location is favorable, appear to be well suited to peach culture.

In the selection of varieties the grower must of necessity be guided by conditions which are impossible to discuss at length here. Briefly, if there is a local market, he can choose varieties that will give him a succession of fruit throughout the season without regard to their keeping qualities. He can thus afford to grow some varieties possessing merit, even though they are poor shippers. The grower whose market is at a distance must of course limit his choice to those sorts which give a firm, well-colored fruit, which will stand the test of transportation and still make a good appearance when offered for sale in a distant market.

Much care should be exercised in the purchase of trees, whether for a home or commercial orchard. The main consideration is to see that the young stock was propagated from healthy, mature, producing trees. Much has been said and written of the depreciation of many varieties of fruit that a few years ago were well known for various good qualities, and there can be no doubt that the cause of such depreciation is directly due to the continued propagation of buds taken from immature stock. Frequently the shoots of stock in nursery rows, themselves of but little over a season's growth, are used to supply the buds for perpetuating a variety which originally possessed

the most highly desirable qualities. These qualities were not discernible until the parent tree had reached its maturity, and the first trees sent out, propagated from it, maintained its high reputation. Each succeeding year, however, with a constant and perhaps increasing demand for this particular variety, sees a greater number of trees propagated from stock less and less mature, the final result being such a deterioration that the fruit of to-day can scarcely be recognized as the variety introduced but a comparatively few years ago. The very characteristics, so marked at the time of its introduction, in many cases are almost entirely obliterated, and but little remains except the name to connect it with the variety as originally disseminated. There are in this State at present some trees of the original stock of the Elberta variety over 20 years old, still vigorous and bearing good crops of typical Elberta fruit, superior in every way to the fruit of other trees about their age, though the latter were purchased from as reputable a firm of nurserymen as the former; the difference being that the former were propagated from thoroughly mature trees, while the latter are the result of years of propagation from one "generation" after another of immature buds.

The average life of the peach tree is also shortened and its ability to resist disease is impaired by such a method of propagation. It therefore behooves the prospective planter to look well into the conditions surrounding the nursery from which he considers purchasing his trees. In the conduct of a commercial orchard it is wise to arrange for the expansion of the business by maintaining a home nursery of sufficient size in which may be propagated the necessary trees, using buds from selected trees only for the purpose, in order to prevent deterioration.

Excepting the production of peaches, no extensive efforts at fruit growing seem to have been made in this locality, but there is little doubt that this industry could be profitably extended. The plum and apricot both deserve attention in this connection, and should do well in many localities in the county, especially on those soils where success is had with the peach. Apples of certain varieties only are to be suggested as being suitable for the climate of this section. Strawberries seem to be deserving of extended cultivation, especially on the Cecil sandy loam, and where the conditions are suitable the blackberry and dewberry should prove profitable.

At the present time considerable attention is being paid to nut culture, and many areas of varying size have been set out in pecan trees. Of comparatively recent introduction as a cultivated crop, it is impossible to state definitely under just what conditions the improved varieties may be expected to give the best results. At present pecans are planted on any available piece of ground, regardless of the texture of the soil, and so far as could be observed the

results are contradictory. While as a native wild tree it is usually found in the lower moist places, some of the improved varieties are to be seen making a thrifty growth on the drier highlands in both sandy and clay soils. New varieties, propagated by budding from trees bearing nuts of a desirable character, are being constantly brought to notice and offered for sale, though the older established kinds, such as Pabst, Van Deman, Frotscher, and Schley, are still the favorites among planters.

An essential in pecan growing is that the trees when transplanted must be dormant, and late fall planting is to be greatly preferred. The trees eventually attain great size and should be planted not less than 50 to 60 feet apart each way. If, however, it is desired to secure a return for the use of the land before the nut trees reach maturity, early bearing fruit trees may be planted between the pecan trees. This industry is in an experimental stage, however, and while the yields from some individual trees are known, it is impossible to obtain sufficient reliable data upon which to base an estimate of the probable income from a grove of 10 to 50 acres.

The chief need of the soils of this county is the adoption of more modern methods of intensive cultivation, which, with the introduction of a new supply of humus-forming material, will serve to restore them to their former condition of tilth and productiveness. As has been pointed out, the supply of stable manures is inadequate for this purpose. The introduction of dairying would in a measure supply this deficiency, but it seems scarcely feasible to introduce dairying into this section, where dependence for necessary labor must be placed in the present race of agricultural laborers, who do not appear to be at all temperamentally suited to the systematic labor required in this industry. The number and quality of cattle kept on every farm could and should be increased, but within limits. The one-horse plow could be profitably dispensed with, and a more thorough preparation of the soil practiced. Seed selection should be introduced and a complete system of rotation of crops be followed. The rotation should include a small grain with grass and clover to follow in order to produce a good sod for turning under.

The cultivation of green manuring crops is strongly recommended, and much benefit would result from their use, augmented by an application of lime at no greater expense than is now incurred in the use of fertilizers alone, and with a more permanent benefit to the land.

SOILS.

Situated partly in the Piedmont Plateau and partly in the Coastal Plain, with the "fall line" passing through the southern part of the county, the soils of Hancock County belong entirely to the predominating series of these regions—the Cecil and Norfolk, respectively.

The soils of the Cecil series are derived from the degradation and decomposition of metamorphic crystalline rocks, chiefly granite, gneiss, and micaceous schist. In many road cuts and along the line of the railroad many representative sections of the rocks from which these soils are derived are exposed. Frequently the weathering has been so complete as to leave only the massive red clay. Where, however, the processes of degradation and decomposition have been less complete remnants of the heavier quartz veins or intrusions that existed in the rock from which the soil was derived are to be seen, having undergone, in many instances, but little change. Besides these quartz veins, sharp quartz sand and small fragments of the original rock material are generally to be found in the red clay subsoil characteristic of this series. The presence of mica, especially in the subsoil, is also usually very marked in all of the members of this series.

The Cecil series of soils is represented in Hancock County by three types, two of which, the clay loam and sandy loam, occur in all parts of the county, comprising perhaps seven-eighths of the area. The other type of the series found here is the Cecil gravelly loam.

The small extent of the Norfolk series, of which but two types—the Norfolk sand and fine sand—are found in the county, is confined to the southern portion, the northern limit being reached in the western part, where the Norfolk areas reach into the surrounding Cecil soils to a point north of the Georgia Railroad in the vicinity of Carrs Station. The soils of this series are derived from the erosion of the rocks of the Piedmont Plateau and other inland areas, and have been transported to their present location. They are the predominating soils of the Coastal Plain, extending from Massachusetts to Texas. The chief truck-producing soil types of the Atlantic seaboard region all belong to this series. They are generally light-colored soils, usually overlying yellowish or orange-colored subsoils of a sandy or sandy clay texture, though where insufficient drainage exists the subsoil is not infrequently somewhat mottled. The two types of this series found in Hancock County are much better adapted to truck growing than to the production of cotton, corn, or other staple farm crops.

The following table gives the names and areas of the several soil types shown in the accompanying map:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil sandy loam	206,336	60.8	Cecil gravelly loam	3,776	1.1
Cecil clay loam	65,664	19.4	Durham coarse sand	3,584	1.0
Norfolk sand	37,632	11.1	Total	339,200	.....
Meadow	15,104	4.5			
Norfolk fine sand	7,104	2.1			

CECIL CLAY LOAM.

The soil of the Cecil clay loam, to an average depth of about 7 inches, consists of a heavy red loam or clay loam, in which is incorporated a considerable amount of coarse material. This gathering on the surface of very coarse sand and rock fragments frequently gives the soil the appearance of the Cecil sandy loam, though generally this layer is very shallow and the change into a heavy clay loam or clay is very abrupt instead of gradual. In cultivating this soil there is always brought to the surface a sufficient amount of the heavier clayey material to modify greatly the effect of the coarser sandy surface layer, so that, notwithstanding its appearance and surface indications, it has the physical characteristics and agricultural value of a clay soil.

The subsoil is a heavy red clay, usually of fine, dense structure and quite retentive of moisture. The presence in it of a considerable percentage of mica, quartz fragments, and other rock material usually is sufficient to promote good subdrainage. The amount of rock fragments in both soil and subsoil is generally considerable, reaching as high as 15 to 20 per cent, though they are seldom of such character as to interfere with cultivation.

As a result of the rolling and hilly topography of much of the section where the Cecil clay loam is found considerable erosion has followed the clean cultivation given it year after year. In the production of corn and cotton especially is this the case where the amount of mica present in the soil and subsoil is large.

The Cecil clay loam has been mapped in all parts of the county, and is the strongest of the soils suitable for general farming. It is well adapted to the production of corn, wheat, and other cereals, and as a grass land it has no superior. Only a limited acreage is devoted to small grains, however, and practically no grass is cultivated in the county; and while not so well adapted to cotton as the Cecil sandy loam, yet nearly the whole extent of this soil is devoted to the production of that crop. Peaches do well on this soil if the location of the orchard is favorable and the subsoil is sufficiently open and porous. However, it is not on the whole so well adapted to their growth as the Cecil sandy loam. Corn does well, yielding from 15 to 25 bushels per acre, and from one-fourth to one-half bale of cotton has been produced under favorable conditions.

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

Mechanical analyses of Cecil clay 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.*
20906	Soil	0.7	4.5	3.1	22.1	25.6	26.3	17.7
20907	Subsoil	1.3	2.8	1.8	11.3	18.4	19.4	44.8

CECIL SANDY LOAM.

The soil of the Cecil sandy loam is a rather coarse sandy loam, varying greatly in depth and usually free from stones. It is of a light-gray color, becoming somewhat yellowish as the subsoil is approached. The subsoil is usually a heavy red clay, not infrequently carrying a small amount of sand in the upper layers. Occasionally small spots are to be observed where the subsoil from about 9 to 24 inches is mottled or yellowish, changing to red at the lower depth.

Like the Cecil clay loam, the Cecil sandy loam is a residual soil. It is the result of the less complete degradation of the granites and gneisses that produced the clay abounding in this region. The presence on the surface of an accumulation of coarse sand, composed mainly of quartz and feldspar, gives at a distance an almost pure white appearance to many small areas of this type.

The Cecil sandy loam is found throughout the county, and occupies most of the lower levels in the rolling country adjacent to the areas of Cecil clay loam in the northern part. While quite uniform in its distribution, the greatest depth of soil is found in the valleys, where it has accumulated after having been washed from the adjoining slopes. Owing to the incoherent nature of the surface soil, it is, when located on the slopes, susceptible of much damage from erosion. The plan of terracing has done much to check destruction from this source, and when properly done is the most effective means yet devised to prevent erosion.

Under the usual climatic conditions the Cecil sandy loam is the soil best adapted to cotton in this county, and under the most favorable conditions it is but slightly inferior to the Cecil clay loam for general farm crops. With usual methods of cultivation and degree of fertilization the type is reported to give an average yield of one-fourth to one-third bale of cotton per acre. Corn does fairly well, and when the sandy surface soil is not too deep it yields as well as when grown on the Cecil clay loam.

Where the location and other conditions are suitable, it is the best peach soil in the county, and the lightest phases are fairly well adapted to melons and for general truck growing.

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

Mechanical analyses of Cecil 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.*
20904	Soil	3.1	20.9	16.8	36.2	11.0	8.5	3.7
20905	Subsoil	1.7	14.7	9.7	21.5	7.3	13.2	31.9

DURHAM COARSE SAND.

The Durham coarse sand occurs as a coarse, light, grayish, incoherent sand, underlain by yellowish sandy clay. The soil varies from 6 to 20 inches in depth, and at about 7 to 9 inches below the surface it assumes a yellowish color and becomes somewhat loamy. Increasing in loaminess with depth, it rests at from 20 to 24 inches upon a subsoil of sandy clay, generally yellowish, though at times somewhat mottled or reddish. The subsoil, though somewhat sandy in its upper layers, becomes more claylike with increasing depth.

This is a residual soil derived from the granites, gneisses, and mica-schists of this region, and not infrequently both soil and subsoil carry a varying quantity of quartz and other rock fragments. As a result of the open and porous structure of both soil and subsoil, the Durham coarse sand is not retentive of moisture, nor does it suffer from washing to any great extent, the excess of water falling upon the surface percolating easily into the soil and subsoil instead of running off the surface.

This type occupies but a small percentage of the whole area, occurring in isolated spots, the largest and most numerous being located in the eastern part of the county. Being scattered throughout the whole county, it is usually cultivated in the same manner as the Cecil sandy loam, regardless of its special adaptation, though the yields of corn and cotton on it are inferior to those obtained in the heavier types of soil. This type of soil is adapted to the production of sweet potatoes, melons, and other crops requiring a warm soil, and should prove suitable for the production of early truck. It is, however, used chiefly in this area for the production of cotton and corn. Peaches are grown in one locality on this type, though it is not so well adapted for this purpose as the Cecil sandy loam. The yields of corn and cotton are reported to be small.

The following table gives the results of mechanical analyses of fine-earth samples of the soil and subsoil of the Durham coarse sand:

Mechanical analyses of Durham coarse 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.*
20900	Soil	3.8	24.3	16.5	37.1	7.3	6.8	4.4
20901	Subsoil	3.8	24.0	17.3	35.9	6.1	8.0	5.0

CECIL GRAVELLY LOAM.

The soil of the Cecil gravelly loam is a grayish to reddish-brown sandy loam, 6 to 9 inches in depth, in which is incorporated a large amount of quartz fragments and gravel, ranging in size from small

particles to upward of three-fourths inch in diameter. The subsoil is a very micaceous heavy red loam in which occur quantities of rock fragments and gravel similar to those found in the soil.

Being of a very incoherent nature, this soil if located on a slope is very susceptible to damage by erosion. When found on moderately level uplands it is usually a well-drained, warm soil, though somewhat inferior in productiveness to the Cecil sandy loam. It is derived from the coarser grained and more micaceous rocks of this region, and is the result of a less complete weathering and degradation of the rocks than perhaps any other member of the Cecil series. It occupies small and disconnected areas chiefly in the central part of the county and toward the northern boundary. Cotton and corn are the principal crops grown on this type in the county. The soil is given about the same treatment as the Cecil sandy loam with which it is associated, the reported yields showing it to be somewhat inferior in productiveness to that type for these crops. Where suitably located, however, it is well adapted to peaches, plums, apricots, strawberries, and small fruits.

NORFOLK SAND.

The soil of the Norfolk sand is a medium to rather coarse incoherent sand, from light-gray to yellowish-brown in color, overlying a subsoil of loose yellowish sand. The soil usually has a depth of from 6 to 9 inches, though occasionally it exceeds the latter depth in areas of small extent. The subsoil from about 7 to 36 inches or more is distinctly yellowish, becoming at the extreme depth somewhat mottled with red, and it is generally somewhat more open and porous than the soil. Accumulation of organic matter in the upper layers of the soil sometimes gives it a darker color and tends to make the surface inch rather firm in virgin areas. The structure of the subsoil is such that it offers but little resistance to the passage of water through it, in consequence of which, though the Norfolk sand is a warm and early soil, it is susceptible to drought, and applications of commercial fertilizers are apt to produce but little benefit if used in a rainy season.

The Norfolk sand is found in the southern or Coastal Plain portion of the county, the largest area lying along the southern boundary, extending eastward from about the middle of the line. Some smaller areas also occur in the southwestern part, and a somewhat extensive area is found in the vicinity of Carrs Station on the Georgia Railroad in the western part of the county.

This soil is adapted to truck rather than to general farm crops, though at present cotton and corn are the only crops grown upon it. It is stated that 8 to 12 bushels of corn and about one-fourth bale of cotton are the average yields per acre.

The rapidity with which the mineral constituents of commercial fertilizers are withdrawn from this type of soil in rainy seasons urges the necessity for supplying the soil with an abundance of organic matter either by applying stable manure or by cultivating green manuring crops. By this means the moisture-holding capacity of this soil type will be greatly increased, enabling it better to withstand droughts as well as rendering more efficient any commercial fertilizers that may be applied to it.

The following table gives the results of the mechanical analyses of samples of the soil and subsoil of the Norfolk sand:

Mechanical analyses of Norfolk 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.*
20912	Soil	1.5	21.9	19.2	38.3	8.2	7.8	3.1
20913	Subsoil	1.3	20.5	18.5	39.1	8.7	8.3	3.2

NORFOLK FINE SAND.

The soil of the Norfolk fine sand consists of a fine gray sand, carrying sufficient very fine sand to impart a smooth, velvety feeling to the whole. It is, however, a true fine sand, containing as it does a very small proportion of clay or any material coarser than fine sand. It is usually about 7 inches deep and is more compact than is usual in the case of sandy soils, although it is readily put in good tilth, even as found in its virgin state. The subsoil, from 7 to 37 inches in depth, is a sand very similar in texture to the soil, of a light yellowish color, though in some cases at about 3 feet it becomes somewhat mottled with red, and with increasing depth becomes more or less sticky, as it gradually develops into a sandy clay.

Frequently when not cultivated the surface inch of soil is much darker than the succeeding layers, due to the decomposition of accumulated organic matter on the surface in the form of grass, pine needles, leaves, etc.

The drainage of the Norfolk fine sand, as in this county, is good, and the structure of both soil and subsoil is such that crops growing on this type are far less liable to suffer in times of drought than are those on the coarser and more incoherent Cecil and Norfolk sands. The structure of both soil and subsoil of this type is such as to permit all surplus water to pass off by seepage, while sufficient moisture to supply the needs of the growing crops is retained.

This soil is found only in the southeastern or Coastal Plain portion of the county. Practically all of it is devoted to the production of cotton and corn.

The Norfolk fine sand is generally a more productive type than the Norfolk sand and is far better adapted to truck than to general farm crops, and is, generally speaking, one of the best early truck soils on the Atlantic coast, being largely devoted to this purpose from New Jersey to Florida.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Norfolk fine sand:

Mechanical analyses of Norfolk 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.*
20914	Soil	0.8	15.1	14.4	39.5	13.9	11.4	4.9
20915	Subsoil	1.8	17.3	10.8	38.3	16.4	10.3	4.8

MEADOW.

The soil mapped as Meadow in Hancock County consists of strips of various widths along the margins of streams, many of them subject to overflow. The term is used in a descriptive sense only, not in the way of a classification, as practically all soil types may be represented. These areas are usually poorly drained and many of them covered with a growth of alder, willow, gum, and other shrubs and trees, while those that have been cleared support a good growth of native grasses. Much of this land, when properly drained, is suitable for corn, sugar cane, etc. It is doubtful, however, whether it is not more advantageous to maintain them in grass for pasture rather than to cultivate them.

SUMMARY.

Hancock County, with an area of 530 square miles, is situated in "Middle Georgia" at the junction of the Piedmont Plateau and Coastal plains.

Much of the county is hilly and rolling. The general elevation is about 500 feet above sea level, the direction of the slope being from north to south. Good natural drainage is obtained through the Oconee River and its tributary streams on the west and through Ogeechee River on the east.

The climate is mild and pleasant, the periods of cold in winter being brief. The summers are warm, but the heat is not oppressive. The average annual precipitation is about 50 inches and is well distributed throughout the seasons.

Sparta, situated in the central part of the county, is the county seat and chief local market. Its population in 1900, according to the Twelfth Census, was 1,150. This town is conveniently reached from all portions of the county by a well-devised system of roads. The

Georgia Railroad traverses the county from east to west, and affords means of communication with the chief cities of the State.

Cotton is the chief product of the county, the annual production approximating 15,000 bales. Corn, oats, wheat, and other staple crops are also grown to a limited extent.

Comparatively little live stock is kept in the county, consequently but little stable manure is used, dependence being placed on commercial fertilizer, for which, in 1899, $53,540 was expended.

The incorporation of organic matter by growing legume crops and by applying barnyard manure would result in marked improvement in the soils.

The average yield of cotton is about one-third of a bale; of corn, 7 bushels; wheat, 6 bushels; and oats, 11 bushels per acre. The introduction of a system of rotation to include a good green manuring crop would serve to increase the organic content of the soils and tend to increase the yields much above those stated, besides doing much toward the permanent improvement of the land. Attention should also be paid to selection of seed, in order to obtain varieties best adapted to the local conditions under which they are to be grown.

The tendency to serious damage of the land by erosion in many of the fields in this area demands that a properly laid-out system of terraces be installed, in many instances, to stop the destruction where it has already begun or to prevent it in others where it is threatened. Deeper breaking of the land should be practiced and greater attention paid to the preparation of the seed bed. The cost of labor in such preparation will surely be amply repaid by the increase in crop production.

The Cecil sandy loam is the most extensive soil type found in the county. It is well adapted to cotton and, when suitable locations are selected, to peaches and other fruits.

The Cecil clay loam ranks next in extent, and is well adapted to the growing of general farm crops and those varieties of cotton that thrive best in a clay soil. It is also a good grass and grain soil.

Both the Norfolk sand and Norfolk fine sand occur in this area. These soils are adapted to the production of melons, sweet potatoes, and other truck and garden products.

The Meadow lands, occurring along the stream courses, are more valuable as permanent pastures than for cultivation, though producing good crops of natural grasses for mowing.

The Cecil gravelly loam and Durham coarse sand occur in small areas. Owing to the open and porous nature of both soil and subsoil of these types crops are apt to suffer greatly even in periods of partial drought.

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