

SOIL SURVEY OF DEKALB COUNTY, GEORGIA.

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DESCRIPTION OF THE AREA.

Dekalb County lies in the north-central part of Georgia. It is bounded on the northeast by Milton and Gwinnett Counties, on the southeast by Rockdale County, on the south by Henry and Clayton Counties, and on the west by Fulton County. The western and southern boundaries are practically straight, while the northern and eastern boundaries are irregular, running from the northern extremity of the county southeastward and then southwestward to the southeastern corner. The county line is in dispute in many places and the boundary shown on the accompanying map is based upon tax returns. The extreme length of the county from north to south is 22 miles and the extreme width from east to west 18 miles. It has an area of 272 square miles, or 174,080 acres.

The county was originally a smooth plateau, as is evidenced by the level skyline. The region is dissected by stream courses, however, and the present topography is gently rolling to hilly. The more gently rolling areas occur in the southeastern and extreme northern parts of the county, while a very hilly and broken region extends northward from Decatur along the Fulton County line to a point a few miles north of Nancys Creek. A conspicuous feature of the topography is the occurrence of isolated mounds which stand on the upland, some of which assume the proportions of mountains and have been named Arabia, Pine, Rock Chapel, and Stone Mountains. Stone Mountain has an elevation of 660 feet above the level of the surrounding country and covers an area of more than a square mile.

The county lies within the drainage basins of the Chattahoochee and Altamaha Rivers, the former river flowing into the Gulf of Mexico and the latter into the Atlantic Ocean. The divide between the two practically conforms to the line of the Georgia Railroad, extending from the western county line to the vicinity of Clarkston, thence northeastward to Tucker and northward to the Gwinnett County line.

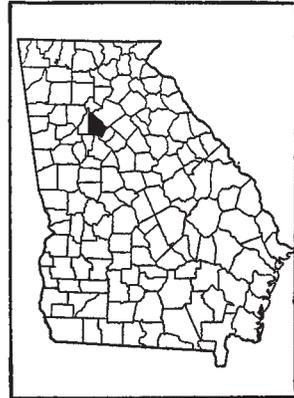


FIG. 15.—Sketch map showing location of the Dekalb County area, Georgia.

The drainage of the country north of this general line is carried southwestward to the Chattahoochee River, chiefly by the North and South Prongs of Peachtree Creek and by Nancys Creek. The greater part of the county is drained by the South Fork of Ocmulgee River, which ultimately empties into the Altamaha River. The slope of the southern part of the county is to the east and southeast. Yellow River flows for a short distance through the eastern part of the county.

Dekalb County was formed in 1822 from parts of Henry and Fayette Counties. At a later date a part of its original territory was added to Fulton County. The earliest settlers came from the eastern part of the State and from the Carolinas and Virginia. During recent years many settlers from the surrounding counties have come to Dekalb County. In the 1910 census the population is reported as 27,881, an increase of 6,769 over the preceding enumeration. A large percentage of this population is urban or suburban. The suburban districts are most numerous in the western part of the county from East Lake northward to Silver Lake and eastward to Stone Mountain.

The ninth ward of the city of Atlanta, which covers 1,900 acres of territory, is included within the county limits. Decatur, the county seat, with a population of 2,466, is located 6 miles from the center of Atlanta. Kirkwood, another suburb of Atlanta, has a population of 1,226. Chamblee, Clarkston, Stone Mountain, and Lithonia are incorporated towns, the latter two being noted for extensive granite quarries. There are other smaller villages throughout the county.

Dekalb County is well supplied with transportation facilities, being traversed by three important railway systems and an electric line, the latter running between Atlanta and Stone Mountain. The Georgia Railroad accommodates the greatest number of towns. The main line of the Seaboard Air Line Railway between Richmond and Birmingham crosses the north-central part of the county, while the main line of the Southern Railway crosses the northern part. The Atlanta and Brunswick division of the Southern Railway crosses the southwestern corner. The trolley system of Atlanta extends out into the county and reaches Decatur, Kirkwood, East Lake, Druid Hill, and other points.

Public roads are numerous, their aggregate length approximating 800 miles. A small percentage of this is paved, and a part surfaced with sand or gravel, the remainder being ordinary graded dirt roads. Most of the roads are well kept, but in some places they are difficult to travel during wet weather, owing to the sticky, plastic character of the road material.

Rural mail service and telephone lines extend into all parts of the county.

CLIMATE.

The climate of Dekalb County is characterized by long summers and short winters. The summers are marked by periods of oppressive heat, although the temperature seldom reaches a maximum of 100° F. The winters are generally mild and open, with periods of damp, penetrating cold, during which the temperature seems lower than is shown by the thermometer.

The precipitation is ample for the successful production of all crops common to the region, the mean for the year being 49.47 inches. The total amount for the driest year of which there is any record was 33.13 inches.

There is a normal growing season of 225 days. The average date of the last killing frost in the spring is March 23, and of the first in the fall November 3. The latest date of killing frost recorded in the spring is April 24, and the earliest date recorded in the fall October 11.

The data in the following table are compiled from the records of the Weather Bureau station at Atlanta and are fairly representative of climatic conditions in Dekalb County.

Normal monthly, seasonal, and annual temperature and precipitation at Atlanta, Fulton County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	44.6	73	1	4.64	3.25	5.42
January.....	42.2	73	— 2	4.78	3.62	3.89
February.....	45.2	78	— 8	5.05	3.51	5.91
Winter.....	44.0			14.47	10.38	15.22
March.....	52.4	87	8	5.57	2.31	8.16
April.....	61.1	89	25	4.07	1.62	1.34
May.....	69.5	94	38	3.37	2.52	6.86
Spring.....	61.0			13.01	6.45	16.36
June.....	75.6	98	39	3.96	1.88	4.71
July.....	77.6	100	58	4.30	2.67	1.85
August.....	76.1	98	55	4.47	8.74	3.89
Summer.....	76.4			12.73	13.29	10.45
September.....	72.1	97	43	3.52	0.56	14.26
October.....	62.4	91	30	2.31	0.10	3.99
November.....	51.9	82	16	3.43	2.35	4.70
Fall.....	62.1			9.26	3.01	22.95
Year.....	60.9	100	— 8	49.47	33.13	64.98

AGRICULTURE.

The country comprised in Dekalb County was originally densely forested. The region was opened for settlement and clearing began early in the nineteenth century. Extremely wasteful methods were employed, the forests in most cases being burned. At present about 30 per cent of the county is forested with the native growth, consisting chiefly of oak and hickory, with some shortleaf and loblolly pine.

Early agriculture consisted of the production of such crops as were necessary for the sustenance of the settlers. As the country developed and trading points were established, the production of supplies that could be more economically obtained in trade or by purchase was discontinued, and the attention of the farmers was confined mainly to such products as could be most easily and economically produced on the soils of the county. The demand for a money crop led to a one-crop system of farming and little attention was paid to the maintenance of soil fertility.

At the present time there is a tendency toward a more diversified system of farming, including, besides the important staple cotton, such crops as corn, oats, cowpeas, hay and forage, and vegetables. Dairying is also being developed. The demands of Atlanta, which is the chief market for all the products of the county, encourage the development of trucking, poultry raising, and dairying. At present the demand for such products in Atlanta is greater than the supply from the immediate vicinity.

Cotton has been the chief money crop of the county since the close of the Civil War. The steady increase in the price of cotton during the last few years has caused a corresponding increase in the acreage devoted to it. According to the census, there were 25,426 acres planted to cotton in 1909, an increase of 6,512 acres over the figures for 1899. The production for 1909 was 11,268 bales, an increase of 3,831 bales over that reported for 1899. The average yields for the county have ranged between 0.33 and 0.44 bale per acre. As a rule, the highest yields are obtained on the heavier Cecil types in seasons of average rainfall, while in dry seasons the best yields are obtained on the sandy Cecil soils and the Appling sandy loam.

The methods of handling the crop are quite variable. It is the general practice of the more progressive farmers to flat-break or broadcast their land with a two-horse plow, after which it is bedded. The plowing is generally done during the months of December, January, and February. Very few farmers harrow the land after plowing. The rows are usually laid off about $3\frac{1}{2}$ feet apart, although where the land is well built up a 5-foot space may be used. It is desirable to plant the cotton as early as possible, although the greatest acreage is planted between the 10th and 25th of April. The crop

receives from four to seven cultivations, including two by hand hoes. The first cultivation is done with the diverse harrow when the young plants are well above ground, after which the plants are thinned out by chopping to stand from 10 to 24 inches apart in the drill. Another cultivation is then given with the diverse harrow, after which cultivators and scrapes are used. The crop is "laid by" about the middle of July.

Commercial fertilizers are invariably used with cotton. The mixtures contain from 8 to 12 per cent phosphoric acid, 2 to 4 per cent nitrogen, and 2 to 5 per cent potash. The 9-3-3 and 10-2-2 grades are the most commonly used, although the low grade of 8-2-2 is used to a considerable extent. The ordinary application is 250 pounds per acre; a number of farmers apply from 400 to 600 pounds per acre. When the larger quantity is used it is distributed in two applications, the first at the time of bedding and the second when seeding is done or at the second cultivation. A side dressing of nitrate of soda is applied in a few instances.

Several varieties of cotton are grown, the big-boll varieties, including the Cleveland, Russell, and Truitt, predominating over the small-boll varieties, such as the King and Broadwell. The varieties become badly mixed at the gins and no attempt is made to select seed.

According to the 1910 census, 20,447 acres were planted to corn in 1909, a decrease of 3,773 acres from 1899. The area devoted to this crop during the last 40 years has averaged about 20,000 acres a year, and average yields have ranged from 11 to 13 bushels per acre. The low yields are the result of growing the crop on the poorest soils of the farm, with insufficient fertilization and cultivation. The average yield of the county for 1913 was 12 bushels per acre. On certain demonstration farms an average yield of 48 bushels per acre was obtained. On measured acres in the Boys' Corn Club contests for 1914 the highest yield on the upland was 92 bushels per acre and on the bottom land 130 bushels. The best yields are obtained where the land is plowed deep with a two-horse plow and worked into a good condition of tilth. The rows are laid off about 4½ feet apart, the hills in the rows being from 12 to 36 inches apart. Hastings Prolific is the variety most commonly grown. Commercial fertilizers are in common use on this crop, the grades being about the same as those used for cotton. From 100 to 500 pounds per acre is applied. When the larger quantities are used two applications are made. On some farms stable manure is used instead of fertilizers with good results.

The oat crop is becoming of more importance as the practice of crop rotation is extended. According to the census, there were 2,831 acres devoted to oats in 1909, which is an increase of 1,180 acres over the figures given for 1899. The average yields as reported by

the last three censuses have ranged from 9 to 16 bushels per acre, the latter yield being obtained in 1909. A part of the crop is grown for the grain and a part is cut green for hay.

The prevailing method of seeding oats is to drill the seed in deep furrows about 14 inches apart between the cotton or corn rows. In some cases it is planted in previously drilled corn or cotton fields. Practically no spring oats are grown. The crop is harvested mainly with the cradle. No commercial fertilizers are applied to the crop, with the exception of a small quantity of nitrate of soda in the early spring. The Appler and Rustproof are the leading varieties grown, and the Fulghum is becoming very popular.

Cowpeas are grown for hay and as a soil renovator. Where grown for hay the seed is generally sowed broadcast on oat land and plowed under lightly. As a soil renovator on corn land the crop is planted between the corn rows at the last cultivation. Some of the ripened peas are picked for seed and the crop is then plowed under. The Whippoorwill, Crowder, Iron, Clay, and New Era varieties are grown.

Wheat and rye are very inextensively grown in the county.

The hay crop consists of pea vines and sorghum mixed, pea vines and crab grass, clover, and alfalfa. Pea vines mixed either with sorghum or crab grass produce from 1 ton to 4 tons of hay per acre. These crops are grown mainly on the dairy farms. Alfalfa and red clover have been tried on small areas in an experimental way and have proved successful in most cases. Crimson clover has given good results as a soiling crop. For pastures Bermuda grass, lespe-deza, broom sedge, and white clover are depended upon. The farmers chiefly use cowpea hay, corn fodder, and cottonseed hulls for roughage. At present there are about 20 silos in use in the county.

Vegetables are grown on nearly every farm, mainly for home use, the surplus being sold in the towns of the county and in Atlanta. Trucking on a large scale is not practiced. According to the last census, there were 143 acres in Irish potatoes, 965 acres in sweet potatoes, and 1,206 acres in other vegetables. Both Irish and sweet potatoes yield from 80 to 200 bushels per acre.

Dairying is not well developed, although there are a number of dairy farms in the county. The census figures show that in 1909 there were 9,708 head of cattle on the farms, of which 6,382 were dairy cows. The cattle are chiefly Jersey grades, although there is some good registered stock. The Holsteins are second in number, but there are not nearly so many of this breed as of the Jersey. The production of milk in 1909 was 2,144,356 gallons, of which 865,229 gallons were sold, in addition to 6,571 gallons of cream. During the same year 595,957 pounds of butter was produced, of which 322,881 pounds was sold. The value of all the dairy products, excluding the home use of milk and cream, is given as \$364,138.

The production of beef and pork has not assumed large proportions, and there are practically no beef types of cattle in the county. More attention than formerly is given to the raising of improved breeds of hogs, and purebred hogs (Berkshire, Poland China, and Chester White) are found on many farms, the Berkshires predominating. Stock raising has been promoted through the eradication of the Texas fever tick.

Systematic rotation of crops is not practiced in the county, although many farmers alternate cotton and corn every few years. Some fields have been planted to one or the other of these crops for a period of 50 years or more.

The expenditure for fertilizer in 1909 amounted to \$92,545, which is an increase of 100 per cent over the expenditure reported for 1899. Most of the fertilizers used are bought ready mixed, but some farmers use home mixtures. Lime is needed on most of the soils to correct acidity, and on the heavy types to improve their physical condition.

Within the last 10 years there has been a marked increase in the use of improved farm implements, especially those used for tillage. The two-horse plow is common, and there are many three-horse disk plows in use. The latest improved cultivators have generally taken the place of sweeps and scrapes.

Labor is scarce. For ordinary farm work laborers are paid \$1 a day, while by the month they receive from \$20 to \$30 and board. The standard rates for picking cotton are 50 to 75 cents per 100 pounds, the former price prevailing at the beginning of the season. In 1909 the expenditure for labor was \$112,954, or \$143 per farm reporting.¹

The number of farms operated by the owners is gradually decreasing. The 1910 census reports about 40 per cent of the farms operated by the owners. Most of the renting of farm land is on the share basis. The landlord furnishes stock, implements, and seed, together with one-half the fertilizer, while the tenant supplies the labor, each receiving an equal share of the crops produced. Under another system of renting the owner receives 1,000 pounds of lint cotton as rental for an average one-horse farm of 25 to 30 acres.

According to the census of 1910 there are 2,678 farms in the county. The average size of the farms is given as 53.5 acres, of which 26.9 acres are reported improved.

SOILS.

Dekalb County lies wholly within the "red-hill" region of the northern part of the State of Georgia, which forms a part of the physiographic division known as the Piedmont Plateau. Conse-

¹ Less than one-third the farms reported outlay.

quently, the soils of the county belong to the Piedmont Plateau soil province, with the exception of narrow strips of alluvium along the stream bottoms, which are classed in the River Flood Plains province. Eleven distinct soil types are recognized in the county, in addition to Rock outcrop and Meadow. The upland or residual soils of the Piedmont Plateau comprise nine types, and the alluvial soils of the River Flood Plains two types and Meadow. The soils of the county are grouped into five soil series.

The upland or residual soils represent inorganic material which is formed through the weathering of the underlying rocks. The parent material consists of old igneous and metamorphic rocks, such as granite, gneiss, mica schist, hornblende schist, and steatite (soapstone). The differences in the parent rock of the various soils are very noticeable in some cases. Rocks closely associated in chemical constituents weather into soils so similar as to warrant their classification with the same series. Consequently the red-clay subsoils of the Cecil series are derived from granite, gneiss, mica schist, and hornblende schist. The Appling and Durham series represent material differently weathered than that forming the Cecil, although the two series are formed of material originally derived from granite and gneiss. In the Cecil series the lighter textured or sandy soils are derived predominantly from the gneiss and granite, while the heavy types are found where the mica and hornblende schists occur. The soapstone and chloritic schists are responsible for a distinct series, the Iredell, which has none of the characteristics of the other series. Outcrops of parent rock give rise to stony types, including the Durham stony loam and in part the Iredell stony loam. Material from outcropping quartz veins, in addition to fragments of the parent rock, gives rise to gravelly and stony types, the only difference between the two being in the size of the stone fragments. The areas mapped as Rock outcrop are nonarable.

The bottom-land or alluvial soils constitute only a small percentage of the area of the county. These soils are composed of material washed down from the upland soils and deposited along the stream courses during times of heavy precipitation and inundation. The Congaree series and Meadow (Congaree material) include the soils of this group.

The mapping of the soils of this county has been somewhat difficult on account of the intricate association of the various soil types. The areas designated as a particular soil type on the map may include small areas of other types which can not be shown on a map of the scale used.

The following table gives the name and actual and relative extent of each of the various soils mapped in Dekalb County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay loam.....	64,640	40.9	Cecil fine sandy loam.....	2,368	1.3
Hilly phase.....	6,528		Rock outcrop.....	1,792	1.0
Cecil sandy loam.....	35,264	20.3	Durham stony loam.....	1,408	.8
Cecil gravelly loam.....	19,904	11.4	Congaree silty clay loam.....	1,344	.8
Cecil stony clay loam.....	14,592	8.4	Meadow (Congaree material)..	1,024	.6
Appling sandy loam.....	11,520	6.6	Iredell stony loam.....	768	.4
Congaree sandy loam.....	9,856	5.7			
Iredell sandy loam.....	3,072	1.8	Total.....	174,080

CECIL SERIES.

The Cecil series includes the most important and widely distributed soils of the Piedmont Plateau. The surface soils are gray, brown, or red. The subsoils consist of red clay. Quartz sand and mica flakes are usually present in the subsoil. Rock outcrops are rare, but fragments and boulders of the parent rock are found in places on the surface. The topography is rolling to hilly, with level to undulating areas in the situations where stream erosion has not been particularly active. The Cecil soils are of residual origin and are derived principally from granite and gneiss, which have weathered to great depths. The drainage, as a rule, is excellent. In Dekalb County this series includes five types—the fine sandy loam, sandy loam, clay loam, stony clay loam, and gravelly loam.

CECIL FINE SANDY LOAM.

The surface soil of the Cecil fine sandy loam consists of a light-gray, friable fine sand to loamy fine sand, grading at 5 or 6 inches into a yellowish-gray to pale-yellow, friable fine sandy loam, which extends to a depth of 12 or 15 inches. The subsoil, to a depth of 3 feet or more, is a stiff red clay distinctly heavier and less brittle than the subsoils of the other members of this series in this county. Included with this type are areas in which the subsoil is mottled red and yellow to a depth of 24 to 30 inches, where the red clay occurs, and small unimportant areas of clay loam, the latter occurring on knolls or brows of slopes where the surficial sand has been removed by erosion. The type is generally free from stony material, although there occur small local areas containing sufficient small quartz fragments to impart a gravelly texture.

This type is confined to the northern part of the county, and is developed in irregular-shaped bodies within a comparatively narrow belt between the Southern Railway and the northwestern corner of the county.

The Cecil fine sandy loam occupies the level and undulating crests of the broader divides and smooth-surfaced and gently rolling slopes. Drainage is well established throughout. Terraces are maintained to prevent the erosion of the fields, although these terraces are generally a considerable distance apart.

This type supported a heavy forest growth of oak and hickory, with some shortleaf and loblolly pine, and about 20 per cent of its area is still forested, the remainder having been cleared for agricultural occupation. Practically all of the cleared land is under cultivation, and the staple crops of the county are produced, with a considerable range in yields. Cotton yields from one-third to two-thirds and occasionally 1 bale per acre, corn from 15 to 40 bushels, and oats from 20 to 40 bushels. On farms operated by tenants the yields are generally low.

The Cecil fine sandy loam is a desirable soil for general farming. It is not as light and loose as the sandy loam, nor is it as heavy as the clay loam. The soil turns easily, and if clods are formed they can be broken down readily with light implements, and a desirable seed bed can be formed with comparative ease. The heavy subsoil renders the type retentive of moisture.

Agricultural conditions on this soil are good. The houses are generally large and the farm equipment ample. The price of land ranges from \$40 to \$100 an acre.

CECIL SANDY LOAM.

The surface soil of the Cecil sandy loam consists of a gray to grayish-brown sand to loamy sand, merging at 6 to 8 inches into a reddish-yellow or brownish, friable and fairly loose sandy loam, which extends to an average depth of 15 inches. The subsoil is a red, friable sandy clay, which quickly grades into the typical heavy, stiff, red clay of the Cecil series. In places, usually where the surface material immediately overlies the heavy, stiff clay of the subsoil, the soil is a reddish-brown or brown, friable sandy loam. This heavier phase of the type is well developed, but is not nearly so extensive as the typical soil. In many local areas, the bedrock is encountered within 2 to 4 feet of the surface, and in a few places it outcrops. Fragments of the parent rock on the surface are of infrequent occurrence. Included with this type are patches of Appling sandy loam, Cecil clay loam, and Cecil gravelly loam, which were not separated on account of their small extent.

The Cecil sandy loam is an extensive type, and has its greatest development in the northern part of the county, in the vicinity of Dunwoody, Chamblee, Tucker, and Clarkston. There are also areas of considerable importance in the eastern part of the county, near Rock Chapel and Redan, and from Lithonia southwestward to the

South Fork of Ocmulgee River. Smaller areas occur in the southern part of the county.

The Cecil sandy loam occurs on the broad, gently undulating stream divides and broad ridges and on the comparatively gentle to steep slopes. The topography as a whole is gently rolling to rolling. Natural drainage is well established. Erosion is generally guarded against by a system of contour terraces, which on the more level areas are usually far apart, while on knolls and slopes they may be only 50 feet apart.

The forest growth on this type is about the same as that on the Cecil clay loam. About 70 per cent of the land is cleared and utilized for agriculture, the staple crops of the county being produced. Cotton yields from one-fourth to 1 bale, corn from 10 to 40 bushels, oats from 15 to 35 bushels, and cowpeas from one-half ton to 1½ tons of hay per acre. Fertilizers are used with all crops. The largest yields are generally obtained on the dairy farms, where large quantities of manure are available.

The physical characteristics of the Cecil sandy loam make it a desirable soil for general farming and trucking. Owing to its light, loose nature, the seed bed is easily prepared and subsequent cultural operations are performed without difficulty. Rainfall is readily absorbed, and is held in the subsoil for the future use of the growing crops. An excellent mulch can be maintained to prevent the rapid loss of moisture during periods of protracted drought. The type is not so well suited for the production of small-grain and hay crops as the heavier textured soils.

The Cecil sandy loam supports many well-established and improved farms, and the general agricultural conditions over the entire type are good. Land values range from \$40 to \$100 or more an acre.

CECIL CLAY LOAM.

The Cecil clay loam consists of a brown to brownish-red clay loam, 6 to 8 inches deep, underlain by a heavy, stiff red clay to a depth of 3 feet or more. The surface soil to a depth of 2 to 4 inches often consists of a brown, heavy sandy loam, and is underlain by a heavy red sandy clay or stiff red clay. Such areas represent a sandy phase of the type, but upon plowing to a depth of 5 or 6 inches sufficient heavy clay material is incorporated with the sandy material to produce a true clay loam texture. In places, as on knolls, the surface soil has been washed away, leaving the red clay exposed, while in other areas a deep sandy surface soil occurs. Such areas are too small to warrant separation on the map. In the vicinity of Ingleside and Scottdale, and north of Chamblee, there are areas of Cecil clay having a silty clay loam surface soil. These also are too

small to be shown on the map. Fragments of quartz and of the parent rock, granite or gneiss, are scattered over the surface of the type in varying quantities, and a number of small spots of Cecil gravelly loam are included. The Cecil clay loam, as mapped along Nancys Creek, is decidedly heavier than in other sections of the county.

This type is most typically and extensively developed in the southwestern part of the county, between Snapfinger and Barbeshela Creeks on the east, and the South Prong of Peachtree Creek on the north. Other large areas occur in the vicinity of Dunwoody, Silver Lake, Clarkston, Tucker, Stone Mountain, and Redan, and in the southeastern corner of the county, and there are many small areas scattered over the entire county.

The topography is moderately to steeply rolling. Gently rolling areas occur in the west-central part of the county. Small areas of the type are badly broken and unsuited for farming, being usually devoted to pastures. These areas are too small to be included with the hilly phase of this type on the map. The drainage is thorough, and terracing is necessary to prevent damage by erosion.

The original forest growth consisted of hardwoods, principally oak and hickory, with an extensive growth of shortleaf and loblolly pine. About 20 to 30 per cent of the type remains in timber.

The Cecil clay loam is the strongest soil of the county for general farming. Crop yields vary considerably on account of differences in farm management. Cotton yields from one-third to 1 bale, corn 10 to 40 bushels, oats 20 to 50 bushels, and cowpeas from three-fourths ton to 1½ tons of hay per acre. Where crops are grown in connection with dairying the yields are always higher.

On account of the heavy nature of this soil, it is especially suited to the production of small grains, grass, and hay, and, therefore, to dairying and stock raising. The land must be plowed under proper moisture conditions and heavy implements must be used to prepare it properly. Many fields have been injured by plowing too wet. The soil clods when plowed, but the clods are easily broken by harrowing. The soil runs together badly during heavy rains. This defect is remedied by deep plowing and the turning under of coarse vegetable matter.

The value of land of this type ranges from \$40 to \$100 an acre, depending upon location and improvements. Much of the land near Decatur is held in suburban lots.

Cecil clay loam, hilly phase.—The surface soil of the Cecil clay loam, hilly phase, is a brown to grayish-brown, friable sandy loam to an average depth of 4 inches. This is underlain by a red sandy clay, which abruptly passes into the heavy, stiff red clay of the subsoil. In the gullied and eroded areas a stiff red clay is encoun-

tered on the surface. There are included areas of sandy loam and clay which are too small to be shown on the map. The phase is generally free from stones.

The hilly phase is developed most extensively from Kirkwood northwestward to the South Prong of Peachtree Creek. Several large areas are mapped near the Fulton County line along the North Prong of Peachtree Creek and in the northern part of the county along Nancys Creek. A small area occurs in the eastern part of the county about $3\frac{1}{2}$ miles southeast of Stone Mountain, and another 1 mile northwest of the same mountain.

The topography, which is the distinctive feature of this phase, is decidedly hilly and broken. The steep slopes of the ridges are gullied to such an extent that the successful cultivation of the phase as a whole is impracticable. There are no appreciable areas of smooth land.

The phase is covered with the native growth of oak, hickory, and shortleaf and loblolly pine. A few areas are cleared for pasture.

Only a few scattered acres of the more nearly level areas are cultivated, and the yields are lower than on the typical soil. The best use of the phase is for forestry and pasture.

Owing to the fact that most of this phase is situated near the city of Atlanta, where it is used in part for suburban homes and clubs, land values are relatively high.

CECIL STONY CLAY LOAM.

The Cecil stony clay loam consists of a brown to reddish-brown sandy clay loam or clay loam, from 6 to 8 inches deep, underlain by a stiff, heavy, brittle red clay which extends to a depth of 3 feet or more. In some places the partially disintegrated bedrock is encountered within the 3-foot section. Varying quantities of rock fragments, the largest of which are about $1\frac{1}{2}$ feet in diameter, are scattered over the surface of the type. The stones are partly the result of outcrops of the parent rock, but are chiefly from outcrops of quartz veins, which are commonly present throughout the rock formation. In places they are sufficiently numerous to prevent the use of the land for farming, especially where they occur as small outcropping ledges.

The Cecil stony clay loam is typically developed in the eastern part of the county in areas of various sizes. The largest area mapped extends from about a mile southwest of the town of Stone Mountain southward along Barbeshela and Snapfinger Creeks for a distance of about 8 miles. Several large areas occur in the southeastern section of the county. An important area lies immediately south of Stone Mountain, and there are a number of smaller areas, particularly in the southern part of the county.

The Cecil stony clay loam occurs on ridges and gentle slopes, and in steep, rough areas. Stony knolls are common. The topography in general is sharply rolling, and the type includes some rough broken areas. The drainage is thorough.

The greater part of this type remains in its native vegetation, which is the same as that on the Cecil clay loam. The few areas that are cleared are cultivated to corn and cotton, about the same yields being obtained as on the Cecil clay loam.

Owing to the stony character of this type, which renders cultural operations very difficult and restricts the use of improved farm implements, its agricultural value is low. The removal of the stones is very expensive.

The agricultural conditions on this type are fair. Land values are high considering the unsuitability of the soil for agriculture.

CECIL GRAVELLY LOAM.

The Cecil gravelly loam as typically developed is a reddish-brown or grayish-brown sandy clay loam or clay loam, underlain at a depth of 7 or 8 inches by a stiff, heavy red clay, which extends to a depth of 3 feet or more. There are a number of variations in the surface soil. In places the fine material is either a clay loam, sandy loam, or fine sandy loam. The areas in the vicinity of Stone Mountain are generally sandy, while those in the northern part of the county comprise fine sandy loams and sandy loams. Angular quartz fragments, the largest of which are about 3 inches in diameter, are scattered over the surface and disseminated throughout the soil and subsoil, constituting from 15 to 40 per cent of the soil mass. The gravel is rather irregular in occurrence, literally covering the surface in some places, while in others it is entirely lacking. The areas in which gravel does not occur can not be indicated on a map of the scale used. About 80 per cent of the total area of the type is of a gravelly character. This type closely resembles the Cecil stony clay loam, from which it is separated on the basis of the smaller size of the stony material on the surface, the boundary lines being largely arbitrary.

The Cecil gravelly loam is developed throughout the county in areas of various sizes. The most extensive development occurs in the eastern part of the county, in the vicinity of Stone Mountain. There is also a large area in the southern part, in the vicinity of County Line Church. Areas of considerable importance are found in the northern part of the county, north of Nancys Creek.

This type occurs in various topographic positions. In some localities it is found only on the crests of ridges, in others along slopes, and sometimes it is uniformly developed in both these positions. Where it is developed in large areas it is found on comparatively smooth stream divides and gentle slopes, as well as on the steeper

and more broken areas. The topography in general is rolling. Drainage is well established. Erosion occurs in some of the steeper positions, but is generally controlled against by terracing.

The native vegetation on this type is similar to that of the Cecil clay loam. Most of the land is cleared and utilized for agriculture. Yields and crop adaptations are about the same as on the clay loam of this series.

While the gravelly character of this type affects its agricultural value, owing to the wear on farm implements and the difficulty of cultivation, it has a beneficial effect in some instances by preventing erosion. On some parts of the type the farms have substantial buildings and improved equipment, while on others the agricultural conditions are not so good. A large percentage of the type is farmed by tenants, and here agricultural conditions are only fair.

APPLING SERIES.

The Appling soils are prevailingly grayish, ranging to pale yellow. The subsoils are mottled or streaked red and yellow, and in some areas grayish or drab. This series is developed in the Piedmont Plateau. The soils are residual mainly from schist, gneiss, and other crystalline rocks. In Dekalb County only one member of the Appling series is mapped, the sandy loam.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam consists of a gray to yellowish-gray medium sandy loam or loamy sand from 8 to 12 inches deep. The subsoil in its typical development begins as a yellow, friable, light sandy clay and passes at 18 to 24 inches into a mottled or streaked red and yellow sandy clay or friable clay. Not infrequently the disintegrated bedrock is encountered at a depth of 2 or 3 feet. In places the yellow and red mottling is absent from the subsoil, while in others, as on the crests of knolls, a bright-red color is sometimes developed. Again in some places the subsoil is a friable sandy loam, while in others it consists of a rather stiff clay. These variations are so intermingled that they can not be indicated on the soil map. An area of Appling gravelly sandy loam in the vicinity of Lithonia is included with this type on account of its small extent.

The Appling sandy loam is developed in large areas in the southeastern part of the county, the greater proportion of it being included in a strip beginning near Klondike and extending in a northerly to northeasterly direction beyond Rock Chapel. An important area is found to the north of Stone Mountain. Smaller areas are developed in other parts of the county.

This type occupies comparatively smooth stream divides, gentle slopes, and more abrupt slopes along stream courses. The general topography is gently rolling to rolling. Both surface drainage and underdrainage are well developed. The greater part of the Appling sandy loam has been cleared of its native vegetation and is used for agriculture. The yields on this type are considerably lower than on the Cecil sandy loam, but in other respects it compares well with that type, especially in ease of cultivation and adaptation to crops. One of its best uses is for the production of truck crops.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Appling sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
253803.....	Soil.....	4.6	16.8	10.8	36.3	10.1	15.2	6.0
253804.....	Subsoil.....	3.3	15.6	9.5	27.4	8.6	16.6	19.1

IREDELL SERIES.

The surface soils of the Iredell series are grayish brown to dark gray in color and usually carry small iron concretions. The characteristic features of the subsoils are the impervious, waxy nature of the yellowish-brown to greenish-yellow clay and the occurrence of the disintegrated rock generally between 20 and 30 inches from the surface. This series in Dekalb County is derived mainly from chloritic schist. It has a local development, being confined to the extreme southwestern portion of the county, and is represented by two types—the Iredell sandy loam and stony loam.

IREDELL SANDY LOAM.

The surface soil of the Iredell sandy loam is a grayish-brown to dark-brown sandy loam to a depth of 8 to 10 inches. Small quartz fragments and iron concretions are usually mixed with the soil and scattered about over the surface. The subsoil is a plastic, waxy clay, dingy yellow to yellowish brown, or mottled yellow and brown in color. At a depth of 24 to 30 inches the friable disintegrated rock is usually encountered. This bedrock is a soft, olive-green soapstone; or chloritic schist of metamorphic origin, in which are included numerous igneous intrusions, chiefly quartz dikes and sills, the disintegration of which gives rise to the quartz fragments scattered over the soil. Where these quartz intrusions have played a more prominent part in the soil formation the surface sandy loam is deeper than is typical, and the subsoil is a sticky sandy clay rather than a pure clay.

The Iredell sandy loam is confined to small areas in the southwestern part of the county. It is intimately associated with the Iredell stony loam, both soils being derived from the soapstone rock which underlies the greater part of this section of the county.

The topography is rolling to nearly level and the natural drainage of the type is good. Practically all of the areas mapped are under cultivation, although many areas too small to be indicated on the soil map are included in the forested, uncultivated areas of Iredell stony loam.

About 20 bushels of corn per acre, with the use of fertilizer, is considered by farmers a good yield on this type. Oats yield 15 to 25 bushels. Cotton is not so successful as on the Cecil soils, probably because of the sticky, compact nature of the subsoil. Marked improvement in the character of this soil has in some cases resulted from gradually increasing the depth of plowing, thereby mixing small quantities of the subsoil with the sandy soil, which improves its physical condition and extends the feeding area of the plant roots. This type, like the Iredell stony loam, responds freely to the use of kainit. This fertilizer ingredient in a large measure counteracts the "frenching" of corn and the "rusting" of cotton.

IREDELL STONY LOAM.

The surface soil of the Iredell stony loam is a gray to dark-gray loam or fine sandy loam, from 6 to 8 inches deep. The subsoil is a yellow or yellowish-brown, sticky, plastic clay extending to a depth of 20 to 30 inches, where the partially disintegrated bedrock is encountered. Fragments of soapstone and quartz rocks and small iron concretions are scattered over the surface and mixed with the soil and subsoil. These stones represent undecayed portions of the weathered metamorphic bedrock and included quartz intrusions. They range up to 8 or 10 feet in diameter and are in most places sufficiently numerous to preclude ordinary farming operations.

The Iredell stony loam occurs in the southwestern part of the county, south of the South River. The topography is undulating to rolling, and drainage is well established. Only very small areas of this type are under cultivation, and these are usually comparatively free from stones, and most of them would have been mapped as the sandy loam, if they had been of sufficiently large extent. The agricultural practices and crop yields on such areas are similar to those on other areas of the Iredell sandy loam. The Iredell stony loam is best used for pastures.

The original forest growth has practically all been cleared from this type, and the present vegetation consists largely of second-growth oak, hickory, and shortleaf pine.

DURHAM SERIES.

The soils of the Durham series are characterized by the grayish color of the surface soils and the yellowish color of the subsoils. They are derived from light-colored, rather coarse grained granite and gneiss, consisting principally of quartz and feldspar, with some mica. In general the topography is gently rolling; the drainage is thorough and in places excessive, owing to the sandy, porous texture of the subsoil. Only one member of this series is mapped in Dekalb County—the Durham stony loam.

DURHAM STONY LOAM.

The areas mapped as the Durham stony loam comprise, in almost equal proportions, Rock outcrop and a soil having a gray, loose sandy loam surface, underlain at 8 inches by a pale-yellow sandy loam, which gradually becomes heavier with depth and passes into a yellow sandy clay at a depth of 12 to 24 inches. In some instances the type covers areas composed of alternate patches of sandy soil and of flat rock outcrops or boulders, it being impracticable to map the areas either as Rock outcrop or as Durham sandy loam.

The type is inextensively developed, being mainly confined to small areas in the vicinity of Stone, Arabia, and Pine Mountains. The topography is level to smooth.

A thick growth of timber covers the type, although the trees are rather small. Shortleaf and loblolly pine are the predominant species of trees.

Some of the tillable land is under cultivation, cotton being the principal crop. The yields are generally low, averaging about one-fourth to one-third bale per acre.

The type is of little importance on account of its small extent and low agricultural value.

CONGAREE SERIES.

The Congaree soils are brown to reddish brown. There is comparatively little change in color, structure, and texture from the surface downward, though occasionally grayish and yellowish mottling is encountered in the subsoil of poorly drained areas. These soils are developed in the overflowed first bottoms of the streams of the Piedmont region and of those in the Coastal Plain issuing from the Piedmont. The material is derived from the soils of the Piedmont region, with some admixture of wash from Appalachian soils, and in the Coastal Plain a slight admixture of wash from the Coastal Plain soils. The soils are usually poorly drained. In Dekalb County the series comprises two types, the sandy loam and the silty clay loam.

CONGAREE SANDY LOAM.

The Congaree sandy loam in the surface section is predominantly a brown sandy loam or loamy sand. The subsoil, beginning between 8 and 12 inches, is a brown or reddish-brown sandy clay or silty clay. Both the surface soil and subsoil vary considerably in texture and color. Generally along the streams which flow through sandy areas of upland the material is sandier than along streams which flow through areas of heavy soils. Along some streams, particularly the South River, a fine-textured material is encountered. A characteristic feature of the type is the abundance of finely divided mica flakes which are disseminated throughout the soil and subsoil.

The Congaree sandy loam is the most extensive type of alluvial soil in the county. It is developed in narrow strips along most of the streams. Cultivated areas are never more than three-eighths of a mile wide.

The Congaree sandy loam is used for the production of corn and hay and for pasture. Corn yields from 20 to 60 bushels per acre. No fertilizer is used on this type. The soil is easy to handle and works into a good tilth. The native vegetation is similar to that on the Congaree silty clay loam.

CONGAREE SILTY CLAY LOAM.

The surface soil of the Congaree silty clay loam is a brown to reddish-brown silty clay loam. The subsoil is slightly lighter in color and of very nearly the same texture, except in the occasional strata of sandy material, encountered especially in the lower section of the subsoil. Particles of mica frequently occur throughout the soil mass, giving it a somewhat smooth texture. In local areas the mica is extremely abundant.

This type is not very extensively developed. It occurs in the first bottoms of streams. One of the largest areas lies along the South Prong of Peachtree Creek north of Decatur, while several other areas of importance lie along the streams in the southwestern part of the county. The type is subject to overflow by flood waters, although under ordinary conditions it is fairly well drained. It has been damaged to some extent by sandy deposits on the surface during high water. To prevent such damage it is necessary to keep the streams open and free from debris.

The native forest growth on this type consists chiefly of alder, willow, birch, sycamore, beech, and gum, with a few other hardwoods, including white oak and tulip poplar. Most of the timber growth has been removed, however, and the land utilized for agriculture. It is devoted almost exclusively to the production of corn and hay, and to pasture. The soil is very fertile and produces good yields without the application of fertilizer. Corn yields from 25 to

60 bushels or more per acre. Used in conjunction with the adjoining hilly lands, this is a good soil for dairying and stock raising.

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

Mechanical analyses of Congaree silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
253815.....	Soil.....	0.0	0.9	0.6	6.4	6.1	50.0	36.1
253816.....	Subsoil.....	.0	.5	.6	6.6	6.5	51.6	34.1

MISCELLANEOUS MATERIAL.

MEADOW (CONGAREE MATERIAL).

The classification Meadow (Congaree material) is used to designate first-bottom alluvial material which is so variable in texture and structure that no definite type separation can be made. It represents a confused and intricate mixture of all grades of material, ranging from a sand through a sandy loam to a silty clay loam, although the predominant material is sandy.

The total acreage of Meadow is small. Its most extensive development is along the headwaters of the North Prong of Peachtree Creek. It occurs also in several areas in the southwestern part of the county, and along the Yellow River, in the eastern part.

The areas of Meadow are in most cases poorly drained, and are subject to overflow during high water. They are utilized for pasture. The native forest growth consists chiefly of alder, willow, and birch.

ROCK OUTCROP.

Rock outcrop includes areas of bedrock which outcrop and support no vegetation except a few scrubby trees growing from the crevices of the rock. The smaller areas are generally flat, while the larger ones are in the form of lenticular masses which assume the proportions of mountains. The largest of these is Stone Mountain. Arabia and Pine Mountains are important areas, but are not so large as Stone Mountain.

The various areas of Rock outcrop are found in the eastern part of the county. They have no agricultural value.

SUMMARY.

Dekalb County is situated in the north-central part of the State of Georgia. It embraces an area of 272 square miles, or 174,080 acres. The topography is gently rolling to hilly, affording ample drainage. In the hilly sections the drainage is excessive. Large, dome-shaped mountains, comprising single solid blocks of granite, are conspicuous features of the topography.

The county was formed in 1822. Its population, according to the 1910 census, is 27,881, a large part of which is urban or suburban.

Decatur, the county seat, has a population of 2,466. A large number of small suburban towns are located throughout the county and the ninth ward of the city of Atlanta is within its limits.

Transportation facilities are supplied by three railroad systems and by suburban and interurban trolley lines. Fair to excellent public roads extend into all parts of the county.

The climate is characterized by long summers and short winters. The maximum temperature of the summer is recorded as 100° F. There is an average growing season of about 7 months and 10 days.

Cotton is the chief money crop of the county. In 1909 there were 25,426 acres in this crop, with a total yield of 11,268 bales. The general methods of handling the crop are progressive. Corn is the second crop of importance, the area planted to it in 1909 being 20,447 acres and the yield 255,522 bushels. Less attention is given to the production of corn than of cotton. Oats, cowpeas, wheat, and rye are grown to a small extent. Dairying is carried on, but is not well established. The production of beef and pork is not sufficient to supply local needs.

Systematic crop rotations are not generally practiced. Commercial fertilizers are used chiefly on cotton and corn. Farm labor is scarce.

Eleven types of soil, exclusive of Rock outcrop and Meadow (Congaree material), are mapped in this county. The upland soils are chiefly derived from gneiss, schists, and granite, though the two Iredell types are derived from steatite (soapstone). The Congaree soils are derived from alluvial material.

The Cecil series is represented in the county by five types and one phase. The Cecil sandy loam and Cecil clay loam are the predominating types. They are extensively used for the general farm crops of the county. The gravelly loam and stony clay loam of this series are lower in agricultural value, on account of the presence of gravel and stones, which hinder cultivation. The Cecil clay loam, hilly phase, is so rough and broken that it can not be successfully cultivated. The fine sandy loam is a desirable type, though of very small extent.

The Durham stony loam is not a good agricultural type. The Appling sandy loam is not a strong soil, but is an early type and well suited to trucking.

The Iredell soils are heavy, sticky, and difficult to handle. They have only a fair agricultural value.

The Congaree sandy loam and silty clay loam are first-bottom soils which are subject to overflow. They are strong soils and are used chiefly for the production of corn and forage.

Rock outcrop comprises areas of bare rock, with no agricultural value. Meadow (Congaree material) consists of alluvial material, varying widely in texture and color. It has a low agricultural value.

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