

SOIL SURVEY OF THE CARY AREA, NORTH CAROLINA.

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INTRODUCTION.

About one month in the summer of 1901 was spent in making a soil survey of an area lying on both sides of the railway between Raleigh and Cary and extending to Crabtree Creek on the north and to Swift Creek on the south. This area has an extent of 40,320 acres—approximately 63 square miles—and includes within its boundaries the farm of the North Carolina experiment station. It adjoins on the east the area surveyed in 1900.* The work was done at the request of the North Carolina department of agriculture on a base map which was surveyed for the purpose. (See fig. 8, p. 273.)

Tables giving complete climatological data for this region were published in the Report of the Field Operations of the Division of Soils for 1900, p. 188, so it will not be necessary to repeat them in this place, nor will it be necessary to treat of the geology and physiography of the area, as these matters were also set forth in that report.

SOILS.

In the Cary area only four types of soil were recognized. In the following table are given the areas of these different soil formations:

Areas of different soils.

Soil.	Acres.	Per cent.
Cecil sandy loam.....	26,090	64.7
Durham sandy loam.....	8,090	20.1
Meadow.....	3,180	7.9
Cecil clay.....	2,960	7.3
Total.....	40,320	.....

CECIL SANDY LOAM.

The Cecil sandy loam is the most extensive as well as the most important type found within the limits of the present survey. It occurs in all sections of the area, and has generally a rolling or hilly surface. The soil has been formed by the decomposition of the granites, gneisses, schists, and similar rocks that underlie it, but it has been modified somewhat by the influence of water.

*Soil survey from Raleigh to Newbern, N. C. Field Operations Division of Soils, 1900, p. 187.

The soil is a grayish to brown sandy loam from 4 to 10 inches deep, and contains from 10 to 60 per cent of quartz fragments, seldom over 6 inches in diameter and usually much smaller. In some instances the larger fragments have been picked off, but generally no attempt has been made to get rid of them. The subsoil is a stiff, tenacious, slightly micaceous red clay, similar to that of the Cecil clay. It contains some quartz sand and quartz fragments, though the latter occur in smaller quantities than in the soil.

The following table shows the texture of samples of Cecil sandy loam:

Mechanical analyses of Cecil sandy loam.

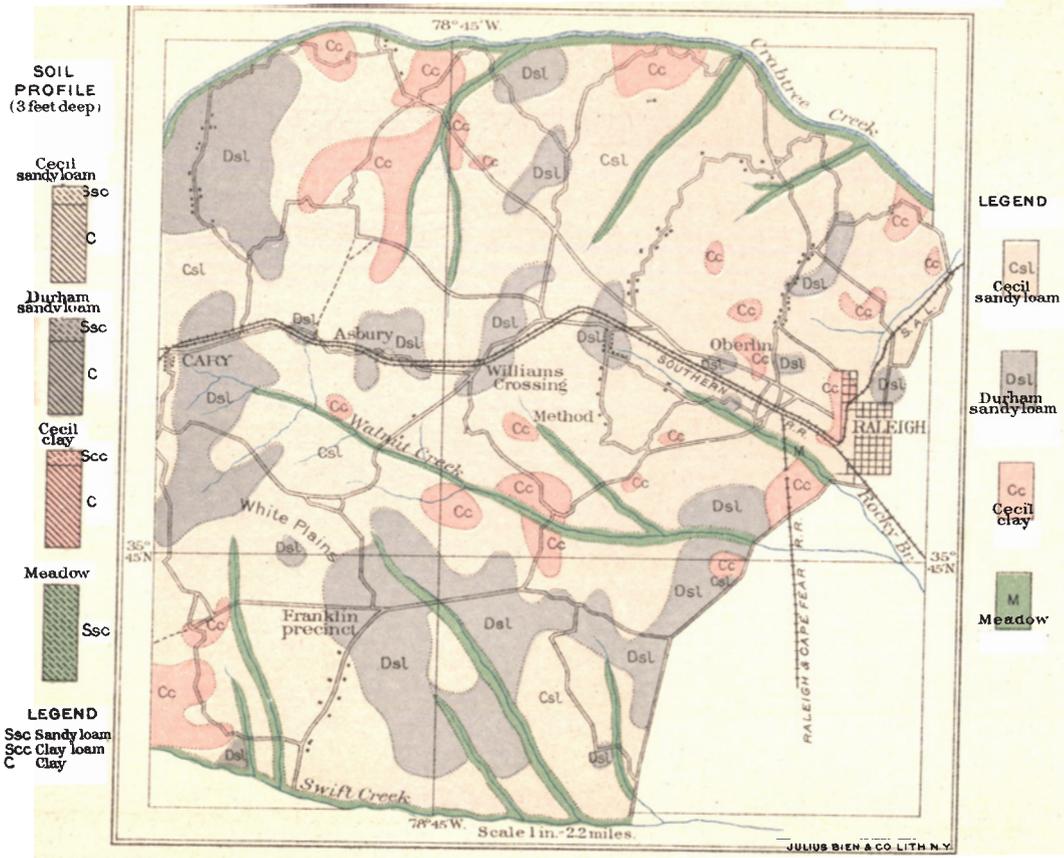
[Fine earth.]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.		Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.								
5859	2 miles N. of Raleigh.	Sandy loam, 0 to 7 inches.	0.01	1.78	4.50	12.80	15.42	39.92	8.44	10.24	5.99	
5735	One-half mile W. of Asbury.	Sandy loam, 0 to 7 inches.	.24	3.98	2.54	6.64	11.62	33.80	14.74	15.96	9.52	
5737	1 mile N. of Franklin Prec.	Sandy loam, 0 to 5 inches.	.01	1.44	2.88	5.12	8.28	33.88	19.10	17.78	10.67	
5739	1 mile NW. of Method.	Sandy loam, 0 to 6 inches.	.01	4.80	4.54	8.90	9.48	34.50	10.46	14.70	12.21	
5860	Subsoil of 5859....	Stiff, tenacious red clay, 7 to 36 inches.	.01	8.30	.72	3.86	6.98	18.60	4.72	16.70	38.93	
5740	Subsoil of 5739....	Stiff, tenacious red clay, 6 to 36 inches.	.....	9.20	3.66	5.02	4.10	9.66	3.20	17.02	47.56
5738	Subsoil of 5737....	Stiff, tenacious red clay, 5 to 30 inches.	.....	9.52	1.84	3.74	3.64	9.12	2.96	17.26	51.08
5736	Subsoil of 5735....	Stiff, tenacious red clay, 7 to 30 inches.	.04	10.92	1.14	1.14	1.80	3.44	3.86	19.62	56.62	

The Cecil sandy loam is a light soil, but suitable for general farming purposes. The red clay subsoil holds manure well, is not porous, but retentive of moisture, and forms a good base for the improvement of the land. The sand keeps the soil from baking and makes it easy to till. This soil is naturally fertile and productive, but where long cultivated is generally run down. When properly farmed the Cecil sandy loam produces fine crops of cotton and corn. The yield of cotton is from one-third to 1 bale per acre. About 200 pounds of fertilizer to the acre is usually applied to this crop. Wheat and oats are also grown,

SOIL MAP

CARY SHEET



but the soil is rather light to give the best results with these crops. Potatoes, peas, peanuts, and fruits do well, and near Raleigh truck is grown to some extent. Much of the land is grown up in scrub oak and pine. It has good natural drainage.

DURHAM SANDY LOAM.

The Durham sandy loam is next in extent to the Cecil sandy loam and has its greatest development in the southern and western portions of the area, where it occurs as the broad, rolling uplands of that region. Smaller areas are found in nearly all parts of the area surveyed. Its surface is less hilly than that of the Cecil sandy loam, and it seldom occurs upon the steeper slopes, being confined almost exclusively to the uplands. The rocks from which this type of soil is derived and those which underlie the Cecil sandy loam are apparently identical, and the reason for the difference in these two soils is not at present known. The rocks are decayed to a great depth, and it is probable that an examination of the unaltered rocks would show them to be of a somewhat different character.

The soil is a gray sandy loam, from 8 to 15 inches deep, containing from 10 to 30 per cent of quartz and rock fragments. The subsoil is a light-yellow clay, becoming heavier with depth, and often grading into a clay of a reddish color. The soil is deeper than the Cecil sandy loam, contains a larger proportion of sand, and has a smaller amount of quartz fragments upon its surface.

The following table gives the mechanical analyses of samples of the Durham sandy loam:

Mechanical analyses of Durham sandy loam.

[Fine earth]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
5746	1 mile S. of Cary..	Heavy sandy loam, 0 to 12 inches.	0.01	3.48	1.98	4.12	4.00	24.20	27.80	31.46	2.29
5743	Method.....	Heavy sandy loam, 0 to 12 inches.	.....	2.02	2.42	5.14	4.12	41.44	24.84	10.36	8.36
5744	Subsoil of 5743....	Light-yellow clay, 12 to 36 inches.	.....	3.52	3.04	3.62	2.92	32.80	16.54	11.56	24.22
5746	Subsoil of 5745....	Light-yellow clay, 12 to 36 inches.	.01	3.32	1.64	2.78	2.92	17.02	24.18	20.70	26.59

The Durham sandy loam is not as strong a soil as the Cecil sandy loam; it is more leachy, does not retain fertilizer as well, and suffers more from drought. It is easily tilled, except for the presence of quartz fragments. Very little tobacco is cultivated within the area examined, but a good quality of bright tobacco can be grown. Corn produces fairly well, and by the use of fertilizers about one-half bale of cotton per acre is obtained. Wheat, oats, and clover are grown, but are not very remunerative crops. Potatoes, peanuts, and vegetables do well, and some trucking is practiced near Raleigh.

CECIL CLAY.

The Cecil clay occurs in small, irregular patches scattered throughout the area. It is found only upon the slopes, generally near the larger streams, and its surface is broken and hilly. It is derived from rocks similar to those that give the Cecil sandy loam. The derivation from apparently the same kind of rocks, the occurrence of the Cecil clay only upon the slopes where erosion has been active, the like character of the subsoils, and the gradation of the one type into the other seem to indicate that in the area examined the difference in these two soils is due to erosion, the sand in the case of the Cecil clay having been removed from the surface.

The soil is a heavy brown or reddish clay loam 6 inches deep, containing from 10 to 60 per cent of quartz and rock fragments. The subsoil is a stiff, tenacious, slightly micaceous red clay, also containing some quartz sand and quartz fragments.

The following table shows the texture of samples of the Cecil clay:

Mechanical analyses of Cecil clay.

[Fine earth.]

No.	Locality.	Description.	Soluble salts, as determined in mechanical analysis.		Organic matter and combined water.		Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.		Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.		P. ct.	P. ct.					
5725	2 miles S. of Williams Crossing.	Clay loam, 0 to 5 inches.	0.01	6.68	8.82	4.28	3.94	23.40	14.20	19.52	18.11			
5861	1½ miles N. of Raleigh.	Heavy red clay loam, 0 to 6 inches.	.01	6.76	2.66	6.36	6.04	24.94	8.28	20.98	24.15			
5862	Subsoil of 5861....	Stiff, tenacious red clay, 6 to 36 inches.	.02	11.98	2.50	3.60	3.24	10.32	5.14	29.30	33.42			
5726	Subsoil of 5725....	Stiff, tenacious red clay, 5 to 24 inches	.01	8.44	4.40	2.80	4.38	14.88	9.62	21.28	34.13			

The Cecil clay is a strong soil and is well adapted to general agricultural purposes. To give good results it requires deep and thorough cultivation. It is a little difficult to till, owing to its heavy, clayey, and stony nature. As much as 35 bushels of wheat per acre have been grown on this soil, but the average is probably not more than 12 bushels. This low average is due to poor methods of farming. Peas, clover, and grasses also do well and help to improve the land. Corn produces from 10 to 40 bushels, and cotton from one-third to 1 bale per acre. The soil is best adapted to the growing of small grain, clover, and the grasses.

MEADOW.

The meadow land occupies only a small per cent of the area, occurring in narrow strips along the streams, usually at an elevation of only a few feet above them. The surface is level or gently rolling. The soil is a stream deposit and varies in its texture, which depends largely upon the character of the surrounding soil. It is generally, however, a sandy or silty loam of a brownish or dark-grayish color, grading into a blue or dark-gray clay. The meadow soils are good grass and pasture land, and in some instances produce fine crops of corn, but they are subject to overflow in time of floods and are liable to injury from this cause. Underdrainage is usually necessary.

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