

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF SOILS

IN COOPERATION WITH THE MARYLAND GEOLOGICAL SURVEY AND THE
MARYLAND AGRICULTURAL EXPERIMENT STATION

SOIL SURVEY OF DORCHESTER COUNTY
MARYLAND

BY

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[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.
Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]

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MAP

Soil map, Dorchester County sheet, Maryland

SOIL SURVEY OF DORCHESTER COUNTY, MD.

By J. M. SNYDER, in Charge, and W. C. JESTER, of the United States Department of Agriculture, and O. C. BRUCE, of the Maryland Agricultural Experiment Station

DESCRIPTION OF THE AREA

Dorchester County lies in the southeastern part of Maryland, between the Choptank and Nanticoke Rivers. The southern and western boundary is formed by Chesapeake Bay and some of its estuaries. The greatest width of the county east and west is about 30 miles, and the greatest length northeast and southwest is about 33 miles. The county has a land area of 576 square miles or 368,640 acres.

This county lies wholly within the physiographic region known as the Atlantic Coastal Plain. It is divided into three well-recognized divisions—the undulating or better drained upland, the low, flat, poorly drained land, and the tidal marshes.

The topography of Dorchester County is prevailingly level. In the central and southern parts there are no breaks from the mainland to the streams or bay, the topography showing just a gradual merging of the upland with the marshes. In the southern part the surface is exceedingly flat. Here the elevation above sea level would probably average 6 to 10 feet, but gradually slopes downward to about sea level in the front lands.

In the northern part of the county the surface is characterized by rather decided slopes along the streams, the slopes becoming more pronounced in the extreme northern part. The topography is undulating, and in the extreme northern part it could be classified as rolling. The elevation in this part ranges from about 20 to 55 feet above sea level. However, there is no break between the northern and southern parts of the county, the two sections merging gradually.

The salt marshes, comprising the third physiographic division, occupy extensive areas in the southern part of the county. The largest tracts are found on both sides of Fishing Bay and between Fishing Bay and the Nanticoke River. Some of the islands in Chesapeake Bay have considerable marsh around them.

Tidal estuaries penetrate into the county from the west. Above tidewater all the drainage is effected through small branches, which continue for comparatively short distances into the uplands. The drainage flows in a southwesterly direction into Chesapeake Bay. The Choptank River, Marshyhope Creek, and Nanticoke River are navigable for large boats; small sailboats and motor boats reach

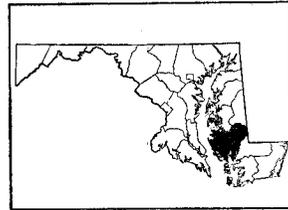


FIG. 15.—Sketch map showing location of the Dorchester County area, Maryland

landings on the other numerous streams. The northern part of the county is well drained. In the southern part, where the surface is flat and has very little fall, the streams are sluggish and meandering. The fresh-water streams are bordered by narrow strips of semi-swampy land. No terraces of any consequence have been developed. The channels of the main upland streams increase gradually from shallow drainage ways near their sources to pronounced depressions near the margin of the upland plain. The junction of the streams with the tidal estuaries is where base level has been reached and cutting has ceased. The streams in the northern part are fairly swift flowing and some of them develop power enough to operate small flour mills. The water supply for farms is everywhere sufficient. Good water can be obtained at a depth of 25 to 35 feet.

Dorchester County was formed in 1669-70. Most of the pioneers came from the western shore and are of English descent. The early settlers found it fairly easy to make a living, because the woods were filled with game and the streams and bays provided a good supply of sea food. The Indians were also peaceable.

The population of Dorchester County, according to the 1920 census, is 27,895, of which 26.8 per cent is classed as urban and 73.2 per cent as rural. In 1880 the population was 23,110. The present population is distributed fairly evenly over the county, with the exception of the coastal lands and marshes. There are a few thickly settled localities in the vicinity of some of the estuaries, where agriculture is secondary to the fish, crab, and oyster industry. This is particularly noticeable at Secretary, Taylors Island, Crapo, and Bishops Head and some of the other settlements in the southwestern part of the county.

The principal towns and villages of the county are Cambridge, the county seat, Hurlock, Vienna, East New Market, Secretary, Taylors Island, Eldorado, and Bishops Head.

The transportation facilities of the county are such that all crops can be moved to markets with very little trouble. Transportation is furnished by the Baltimore, Chesapeake & Atlantic Railway and by the Cambridge branch of the Pennsylvania Railroad, both of which are subsidiaries of the Pennsylvania System. The first-named line crosses the county in a southeasterly direction through Hurlock, Rhodesdale, Reids Grove, and Vienna. The Cambridge branch extends into the county from Federalsburg, Caroline County, to its terminus at Cambridge and serves the communities of Williamsburg, Hurlock, East New Market, Linkwood, and Aireys. The county also has boat lines running to Baltimore. The towns that have regular boat connection with Baltimore are Vienna, Secretary, Taylors Island, and Cambridge. The products of localities near tidewater, in some cases a considerable distance from shipping points, are carried by water to various steamboat wharves at reasonable rates.

The highways in the summer are all in pretty good condition, but during the winter, when there is considerable rain with freezing and thawing, the earth roads are rather poor. There are a number of miles of concrete road in the county. From Cambridge concrete roads extend to Taylors Island, Vienna, and East New Market. From East New Market one fork leads to Easton, Talbot County,

and another fork leads to Salisbury, Wicomico County. The Eastern Shore Trail, a concrete road running down the Eastern Shore of Maryland, crosses the area through Ellwood, Waddles Corner, Hurlock, Shiloh Church, Brookview, Eldorado, and Sharptown, in Wicomico County. Concrete roads leave this road at Hurlock for Federalsburg, at Rhodesdale for Vienna, and at Eldorado for Federalsburg. Practically all sections in the county thus are accessible with automobile.

Telephone service reaches a large number of farms. Automobiles are generally owned, and the use of motor trucks is rapidly increasing. Rural mail delivery reaches all sections of the county and the routes and post offices are so located that nearly every farmer can get his mail daily.

With the exception of a few crops grown for canning, the local markets can not consume anywhere near all the county produces. New York, Philadelphia, and Baltimore are the principal outside markets.

CLIMATE

The climate of Dorchester County is temperate. The average temperature for the year is 56.6° F. The winters, which are not severe, are commonly marked by one or two cold snaps of short duration. The average temperature for this season is 35.9° F. Spring is comparatively early. The summers are normally long. Sometimes they include periods of very warm weather, but such periods are commonly of short duration and more or less tempered by breezes from Chesapeake Bay. The mean temperature for the summer months is 76.1° F. The fall of the year ordinarily is very pleasant, with only a few disagreeable days. The maximum temperature recorded at Cambridge is 104° F. and the minimum is -5° F. February is usually the coldest month and July the warmest.

The growing season is long. The average date of the last killing frost in the spring is April 7 and of the first killing frost in the fall November 5, giving an average growing season of 212 days. Records show killing frost as late as May 6 and as early as October 13, but such extremes are of rare occurrence.

The mean annual precipitation amounts to 44.17 inches. Between 1 and 2 inches of this is in the form of snow. In the driest year on record the rainfall amounted to 35.85 inches, and in the wettest year it was 54.54 inches. The rainfall is rather evenly distributed through the year, though somewhat greater in the spring and summer. Occasionally, but not frequently, crops suffer from droughts or excessive rainfall.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation at Cambridge. This station has an elevation of 25 feet above tide, and the records represent accurately the conditions throughout the county.

*Normal monthly, seasonal, and annual temperature and precipitation at
Cambridge*

[Elevation, 25 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1896)	Total amount for the wettest year (1903)	Snow, average depth
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December.....	37.5	71	-2	3.43	0.98	4.27	4.4
January.....	35.4	76	-5	3.51	1.10	4.71	5.3
February.....	34.9	74	-1	3.66	7.19	6.56	4.5
Winter.....	35.9	76	-5	10.60	9.27	15.54	14.2
March.....	44.7	91	13	4.04	3.92	6.94	3.0
April.....	54.9	93	25	3.70	1.50	3.20	.3
May.....	65.9	100	37	3.64	4.66	1.81	.0
Spring.....	55.2	100	13	11.38	10.08	11.95	3.3
June.....	73.5	100	43	3.86	3.60	4.36	.0
July.....	78.3	103	53	4.61	2.80	4.70	.0
August.....	76.6	104	52	4.58	2.20	7.15	.0
Summer.....	76.1	104	43	13.05	8.60	16.21	.0
September.....	70.4	98	37	3.01	4.00	3.04	.0
October.....	59.5	91	30	3.41	2.00	5.97	T.
November.....	47.4	82	18	2.72	1.90	1.83	.3
Fall.....	59.1	98	18	9.14	7.90	10.84	.3
Year.....	56.6	104	-5	44.17	35.85	54.54	17.8

AGRICULTURE

Ever since Dorchester County was settled it has been preeminently agricultural in its pursuits. The pioneers lived quite comfortably, as the land was productive and the crops were supplemented by an abundance of sea food and game. The main crops grown were wheat, corn, and tobacco.

Tobacco was an important crop in the early days, but the industry later declined. Practically no tobacco has been grown for the last half century. In the early days tobacco was used as a medium of exchange in the colony. The crop was marketed in England or sold in this country to representatives of English concerns. Corn and wheat have been grown ever since the county was settled.

After the Revolutionary War there was a change in the agriculture. The farmers lost their English market for tobacco and found that it was more profitable to produce food crops. Corn, wheat, and oats were the principal crops grown then. The growing of sweet potatoes was begun about the middle of the nineteenth century. Truck growing developed in the northern part of the county some time after the Civil War with the building of the railroad; it flourished somewhat earlier where water transportation was easily available. The railroad not only gave the farmers an opportunity to put their produce on the market quickly, but also increased greatly the value of their timberland, which before that time had a very low value.

The table below shows the number and average size of farms and the average acreage of improved land in farms, as reported by the censuses from 1880 to 1920, inclusive:

Number and average size of farms and acreage of improved land in farms

Year	Number of farms	Proportion of land in farms	Average size of farms	Im-proved land per farm
		Per cent	Acres	Acres
1880.....	2,024	66	120	67.8
1890.....	1,804	60	123	72.4
1900.....	2,007	66.1	121.3	63.9
1910.....	2,214	63.7	106.1	55.9
1920.....	2,019	54.7	100	58

It will be noted from the table above that there has been a slight decrease in the proportion of land in farms, in the average size of farms, and in the acreage of improved land per farm.

One important feature of the progress of agriculture of this county is the decided increase in the value of farm property, as reported by the Federal census. In 1880 the value of all farm property was \$2,414 per farm, while in 1920 it was \$10,783 per farm. The value of the farm land, without the improvements, was reported as \$70.54 an acre in 1920.

The acreage and production of the most important crops are shown in the table below, which is compiled from the reports of the last five censuses.

Acreage and production of the leading crops in 1879, 1889, 1899, 1909 and 1919

Year	Corn		Oats		Wheat		Potatoes		Sweet potatoes	
	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Bushels
1879.....	39,380	644,957	1,107	10,194	25,979	197,905	-----	23,742	559	40,343
1889.....	27,551	367,931	877	9,660	16,952	210,132	527	28,696	402	34,111
1899.....	28,731	654,360	271	4,590	21,969	313,130	581	44,915	328	35,650
1909.....	27,372	694,736	162	2,081	20,947	254,466	706	77,518	356	54,194
1919.....	26,010	631,585	213	2,364	27,163	395,750	701	54,529	760	112,666

Year	Hay		Apples		Peaches		Strawberries		Vegetables
	Acres	Tons	Trees	Bushels	Trees	Bushels	Acres	Quarts	Acres
1879.....	1,416	1,511	-----	-----	-----	-----	-----	-----	-----
1889.....	3,661	4,885	65,892	32,465	377,444	46,718	-----	-----	-----
1899.....	4,942	5,904	80,688	123,062	174,515	20,263	259	446,200	6,032
1909.....	7,903	10,183	46,269	20,009	71,535	17,228	248	324,513	10,966
1919.....	11,885	13,336	36,201	25,771	53,970	36,802	115	179,587	12,741

At the present time the growing of truck crops for the northern markets dominates the agriculture of the northern half of the county. Here the main crops grown are corn, potatoes, cantaloupes, strawberries, watermelons, sweet potatoes, and tomatoes. In the southern part of the county general farming is carried on almost exclusively,

corn, wheat, and hay being the main crops. Corn is grown quite extensively in all parts of the county, but the growing of wheat is confined largely to the southern part.

The raising of cattle is important on only a few farms, but the raising of hogs and poultry is carried on more or less on practically all farms, and on some rather extensively.

Wheat and corn occupy larger areas than any other crops, 27,163 acres and 26,010 acres, respectively, being the areas occupied by these crops in 1919. A large proportion of the wheat crop is made into flour at local mills and the rest is shipped out. The corn crop is used for feeding and fattening livestock, only a small proportion being sold. The corn fodder is used as forage for stock.

There were 9,615 acres in tame or cultivated grasses in 1919, timothy and clover mixed being the most important hay crop grown. The acreage in alfalfa is on the increase and on some of the better drained farms very good yields have been obtained. The tame hay crop is supplemented by the production of annual legumes cut for hay, silage crops, coarse forage, and salt hay from the marshes.

The following table shows the area and production of the various hay and forage crops in 1919, as reported by the census:

Production of hay and forage crops in 1919

Crop	Acres	Tons	Crop	Acres	Tons
All tame or cultivated grasses.....	9,615	11,086	Marsh grass.....	633	515
Timothy alone.....	848	1,078	Grains cut green.....	219	187
Clover alone.....	2,856	3,530	Annual legumes cut for hay.....	1,418	1,548
Timothy and clover mixed.....	3,652	4,233	Silage crops.....	187	1,240
Alfalfa.....	283	637	Coarse forage.....	3,405	2,889
Other cultivated grasses.....	1,976	1,608			

The 1920 census shows that 12,741 acres were planted to miscellaneous vegetables in 1919. This land is devoted mostly to the production of tomatoes, cantaloupes, watermelons, lima beans, peas, lettuce, turnips, radishes, asparagus, and beets. The tomato crop is handled by the local canneries; the other crops are shipped out. The production of potatoes and sweet potatoes for northern markets is developing quite rapidly.

The production of vegetables on a large scale is a comparatively recent development. The value of all market-garden products in 1879 was reported by the census as \$4,809. In 1909 the vegetables were valued at \$597,897, and in 1919 they were valued at \$1,535,082.

Apples, peaches, cherries, and pears are the main orchard crops. There are several commercial orchards in the county that ship car-load lots of apples to the northern markets, but a very large part of the fruit produced is consumed locally. Some of the pears are sold to local canners.

The production of small fruits is not as extensively developed here as in some of the more southern counties on the peninsula. Strawberries were grown on 115 acres in 1919 and yielded 179,587 quarts, and 53 acres of blackberries yielded 53,840 quarts. These are either sold locally or shipped to northern markets.

Poultry raising is an attractive minor interest throughout the area. The value of poultry and eggs produced in 1919 was \$345,386,

according to the 1920 census. Local merchants usually trade in poultry and eggs and ship them to northern markets.

Cattle raising is not carried on very extensively. Enough dairying is done to supply the county with milk and some butter, but the industry has not been developed, although there are areas in which the soils are well adapted to dairying.

No information is available relative to the present value of the forest products. Lumbering is an important industry, supplying a large local demand and also some timber for shipping out of the area. The predominant tree is the loblolly pine, which in this locality makes a rapid and healthy growth. The hardwood species include oaks and gums, of which the red gum is probably the most valuable. Practically every farm has a woodlot. The timber as a rule is in small tracts. In the southern part of the county, however, there are a few areas that are fairly extensive. The virgin timber has all been removed and the second growth is being cut. Trees as small as 3 to 5 inches in diameter can be used in making barrels. The timber is used in the county for building purposes and for the manufacture of barrels, hampers, and crates. The timber that is shipped out includes rough lumber, mine props, and piling. The lumber cut of the county in 1914 amounted to 2,231,160 cubic feet and was valued at \$352,405.¹

The fishing industry is important in the southern part of the county. At the present time crabs, oysters, and fish are shipped to the city markets in large quantities. Many farmers own boats and do considerable fishing and oystering in the off season. Oyster packing houses are situated near the oyster beds.

The broader crop adaptations of the soils of the county are generally understood and observed in the selection of fields. The light sandy soils are used for the production of early vegetables; the heavier types are devoted to the production of general farm crops. Strawberries are usually planted on the sandier soils of the Elkton and Keyport series, where they seem to do very well.

The farmhouses and other buildings vary widely in character. There are many large, attractive houses and many small tenant houses. As a rule the buildings are painted and kept in repair, presenting an appearance of prosperity. Often a number of small out-buildings, such as corncribs, garages, and buildings for housing materials and machinery, are grouped around the barn. Nearly all the farm buildings are situated some distance from the main road.

Windmills and gasoline engines are used for pumping water for the home and stock on a number of the better farms. Some of these are equipped with modern lighting systems. Equipment on many farms includes modern labor-saving machinery. This ordinarily is given fairly good care. The work stock consists of mules and horses of good type.

The farm practices vary, of course, with the farm, but in general are good. In preparing the land for any crop the importance of having a good seed bed is recognized, and care is taken not to prepare the seed bed while the land is too wet. After the land is plowed it is gone over with a harrow and all clods are broken up. Corn is given two or three cultivations. Other crops are cultivated

¹ F. W. Besley. *The Forests of Maryland*, 1916.

enough to keep the field clean and preserve a soil mulch, so as to retain the soil moisture. Binders are used for small grain. Corn is either cut off close to the ground, put in shocks, and husked later, or the leaves and tops are stripped off and tied in bundles, the stalks with ears left standing, and the corn husked from the stalk after it has thoroughly cured. The remaining stalks are hauled and put in the stockyard or they are cut with a disk harrow and plowed under. The truck crops receive good care, and a constant watch is kept to prevent insects and diseases from getting a foothold. Sweet potatoes generally are stored in houses, although if there is a fairly good market some are sold from the field or at least kept only a short time. Potatoes are generally sold as soon as possible.

A rotation of some sort is practiced on nearly every farm in the county. Where such a variety of crops are grown it is difficult to have a fixed rotation, but care is taken not to repeat crops and not to plant crops that draw heavily on the soil too often in the same field. On soils that will produce legumes a legume crop is generally included in the rotation. In the grain sections of the county a rotation consisting of wheat, grass, and corn is in common use. Wheat is planted as soon as possible after the corn is cut, the corn shocks being put wide apart. The strip that is occupied by the corn shocks is planted after the corn has been husked, or if that is too late in the year, it is not planted at all. The grass following the wheat is sometimes kept in two years. The sod is plowed in the spring and prepared for corn.

In addition to green manure, stable manure, and compost, large quantities of commercial fertilizers are used. Of the 2,019 farms in the county, 1,776 reported using commercial fertilizers in 1919. The amount expended for fertilizer was \$356,636, or an average of \$202.51 per farm reporting. Fertilizer in some form is applied to almost every crop. The composition and rate of application vary somewhat. The following table shows the composition of fertilizers most commonly used and the quantity generally applied:

Analysis and rate of application of fertilizers used for different crops

Crop	Formula ¹	Quantity applied per acre	Crop	Formula ¹	Quantity applied per acre
		<i>Pounds</i>			<i>Pounds</i>
Wheat.....	{ 2-5-0..... 2-8-2..... 16 per cent phosphate. }	300	Sweet potatoes.....	2-8-2.....	500
Tomatoes.....	{ 2-8-2.....	300 to 500	Cantaloupes.....	3-8-3.....	500
			Peas.....	2-8-2.....	400
			Watermelons.....	3-8-3.....	600
			Potatoes.....	7-6-5.....	800 to 1,200

¹ Fertilizer formulas in this report are stated in the order, nitrogen, phosphoric acid, potash.

All the available farm manures are applied to the land. Barnyard or stable manure is brought into the county in carload lots. Pine straw, locally called pine "shats" (shatters), is used on every farm. Fish scrap is used to some extent. The use of lime is becoming more general throughout the county.

The expenditure for farm labor in the county increased from \$138,960 in 1899 to \$461,750 in 1919, with an average of \$419.39 for the 1,101 farms reporting. The expenditure for feed on 832 farms

reporting to the census for 1909 amounted to \$39,743, and in 1919 it amounted to \$114,346 on 1,144 farms reporting.

The average size of the farms is 100 acres, of which 58 acres are classed as improved land. A number of farms in the county contain several hundred acres. There are also many small farms of 10 to 30 acres in the vicinity of Bishops Head and Hooper Island, where the owners rely in part upon fishing.

In 1920, 58.4 per cent of the farms in Dorchester County were operated by owners, 40.5 per cent by tenants, and 1.1 per cent by managers. The tenant farms are rented mainly on shares. Various forms of leases are employed and no general statement can be given for the county. The negro tenant as a rule works under a rather close supervision of the owner. Cash rents vary considerably.

The 1920 census reports the average value of farm land in the area as \$70.54 an acre. This value is for the land only without the buildings, and is therefore lower than actual sale value with improvements. From information obtained in the field the prices of farm lands range from \$45 to \$250 an acre, depending on the soil, drainage, location with respect to good roads and shipping points, and state of improvement. Forest land containing a good stand of merchantable timber is held for more than areas of similar soil in a good state of cultivation.

SOILS²

The soils of Dorchester County are prevailingly light in color, that is, they range from almost white or gray to brown. The only black soils in the county are a few spots of Portsmouth loam in the northeastern part. The conditions in the county have not favored the accumulation of organic matter in the soils, as this area was forested until reclaimed for agriculture. In some of the forested areas there is a slight accumulation of vegetable mold on the surface, but as a general rule organic matter is not mixed with soil to any considerable depth. Locally the surface soil to a depth of 2 or 3 inches contains enough organic matter to produce a brown or dark-gray color.

The soils of the county are either neutral or slightly acid in reaction. There is no accumulation of lime carbonate in the soil or subsoil. The light-colored Elkton soils are prevailingly acid in nature and require a moderate application of lime to render them best suited to crop production. The well-drained Sassafras soils are practically neutral or only slightly acid. Some of these soils would be improved by liming, especially if they are to be used in growing clover and alfalfa. All the soils of the county respond readily to complete fertilizers and also to the application of barnyard manure.

With respect to color, drainage, oxidation, and aeration of material there are two distinct groups of soils in Dorchester County. The soils of the northern end of the county occupy undulating to gently rolling areas, are well drained, and are predominantly brown in color; those of the southern half are generally poorly drained and light gray to whitish in color. The boundary between these

² The soils of Dorchester County, Md., do not everywhere join those of Sussex County, Del. The Keyport sandy loam of Dorchester County adjoins Woodstown sandy loam and Norfolk sandy loam, and spots of Sassafras sandy loam and loamy sand are mapped against Elkton sandy loam.

two groups of soils is represented by a line drawn approximately from Cambridge to Rhodesdale to Vienna.

These groups of soils may be distinguished as normally developed soils and as imperfectly developed soils. Those in the northern end of the county, which are brown and well drained, may be considered as the normal, fully developed soils of the region. These have been identified as members of the Sassafras series. They are characterized by the following soil profile: In the virgin soils there is a film of forest débris consisting of leaves, twigs, and roots, with a small quantity of gray mineral matter. Beneath this the main body of the surface soil, or horizon A, is a brown or yellowish-brown relatively light textured layer varying in thickness. The typical subsoil, or horizon B, consists of a reddish-yellow or reddish-brown firm to compact sandy clay or clay, always heavier in texture than the A layer. This extends to a depth of 30 to 36 inches. Below this is encountered a looser material, usually lighter in color and more or less mottled, consisting of the unweathered or slightly weathered material of the geological formation.

The heavy texture of the B layer constitutes evidence of a well-advanced stage of development in the soils of this region. It is the seat of deposition of material carried from above by the downward percolating soil water; consequently it contains a higher percentage of the fine material of the soil than the layers above. It constitutes the reservoir of soil moisture for the soil as a whole, and usually it contains a higher percentage of potash than the surface soil. It is the lowest horizon in which the weathering is complete or approximately complete.

In the southern or lowland portion of the county, where the surface is flat, elevation low, and drainage poor, there is another group of soils that indicate in their profile that their development has been retarded or influenced by excessive moisture. In areas where surface drainage is imperfect and the soil has been subjected for considerable periods of time to the influence of excessive moisture and imperfect internal drainage during parts of the year, and to conditions of deficient moisture during periods of dry weather, that is, to alternating wet and dry conditions, the surface soil has a gray or nearly white color. In a few forest areas there is an accumulation of vegetable matter on the surface. The main subsoil layer or horizon B consists of heavier material mottled gray, yellow, and brown. This layer varies in thickness and in structure, but usually at depths of 28 to 34 inches it is underlain by material which is lighter in color and much more friable in structure. This represents the parent material. The mottled color of the entire profile is evidence of incomplete oxidation. The Elkton soils belong to this group.

Occupying a position between the Sassafras and Elkton soils is an intermediate grade of material as regards color, drainage, and structure. These conditions give rise to soils that have been grouped in the Keyport series. The soil profile is somewhat similar to that of the Sassafras to the bottom of horizon A, which comprises the surface and the subsurface layers. Horizon B, or the true subsoil, shows evidence of incomplete oxidation in its mottled gray, yellow, and brown color. It is heavier in texture, has a tough structure, and in many respects resembles the subsoil of the Elkton soils. The

mottled condition of the lower subsoil is not due entirely to imperfect drainage, but in part to the fact that oxidation has not yet extended below about 12 to 18 inches. Below the typical subsoil is found the light-textured and loose-structured material of horizon C or the parent material.

In addition to the three main soil groups described above, there are spots of apparently well developed soils classed as Norfolk, and also a few spots of very imperfectly developed soils classed as Portsmouth. Tidal marsh is as yet a geological formation or represents material in process of becoming soils.

The soils of the county are developed upon two distinct geological formations or classes of material—the Wicomico formation, which covers the northern end of the county, and the Talbot formation, which covers the southern part. In the northern part the weathering of the unconsolidated beds of sand and clays has given rise to brown surface soils and yellowish-brown loamy sand or friable sandy clay subsoils. In the southern part of the county the soils have not undergone as much aeration and oxidation as in the northern part, and the original material as laid down by the ocean has a closer resemblance to the soils. The soils of the southern part are therefore heavier in texture and have a tougher and more compact structure than those of the northern end of the county.

The soils derived from the weathering of these materials are classified into soil series and soil types. The soils that are similar in common profile characteristics, such as color, structure, number and thickness of layers, and drainage, are classed in a soil series. Each series consists of soil types which differ in texture of the surface soil, or the relative proportion of the coarser and finer soil particles. In this area 5 series are represented by 11 types and 1 phase. In addition, 2 miscellaneous types, Meadow and Tidal marsh, are mapped.

The Sassafras series is characterized by surface soils of brown color and friable mellow structure. The subsoil is reddish yellow to reddish brown and rests upon beds of sand or gravel at depths ranging from 30 to 50 inches. The open substratum insures excellent drainage. Four types of the Sassafras series have been recognized in this county, the loam, sandy loam, loamy sand, and sand.

The Elkton series has gray to light-gray surface soils and a mottled gray, whitish, yellow, and rusty-brown subsoil of heavy plastic structure. A sandy substratum, occasionally saturated with water, occurs in places in the lower part of the 3-foot section. The Elkton series is represented by the loam, sandy loam, and the silt loam, with a low phase.

The Keyport series includes brown to grayish-brown soils over a mottled gray, yellow, and reddish-brown subsoil. The color of the subsoil and its more plastic structure distinguish it from the Sassafras series. The substratum of sand that is found in the Sassafras and Elkton series is also present in the Keyport. The Keyport series represents an intermediate stage of development between the Sassafras and the Elkton soils. In Dorchester County two types are mapped—the Keyport sandy loam and silt loam.

The types of the Norfolk series are characterized by grayish surface soils and a yellow friable subsoil. The Norfolk series is developed

very extensively throughout the southern part of the Coastal Plain region. The Norfolk sand is the only type mapped in this area.

The Portsmouth series includes types characterized by black surface soils and a gray to whitish subsoil. As a rule the substratum consists of white sand, and is generally water-logged. Soils of this series are developed in depressed areas and are poorly drained. The Portsmouth loam is mapped in Dorchester County.

The soil types are described in detail in subsequent pages of this report. Their distribution is shown on the accompanying soil map. The table below shows the actual and relative extent of the soils mapped:

Areas of different soils

Soil	Acres	Per cent	Soil	Acres	Per cent
Elkton silt loam.....	98,688	43.8	Sassafras sand.....	8,704	2.3
Low phase.....	62,848		Elkton loam.....	7,808	2.1
Tidal marsh.....	69,056	23.9	Sassafras loam.....	6,400	1.7
High phase.....	19,072		Norfolk sand.....	6,760	1.6
Sassafras sandy loam.....	35,904	9.7	Meadow.....	5,056	1.4
Sassafras loamy sand.....	13,952	3.8	Portsmouth loam.....	1,344	.4
Elkton sandy loam.....	12,800	3.5			
Keyport sandy loam.....	11,008	3.0			
Keyport silt loam.....	10,240	2.8	Total.....	368,640	-----

SASSAFRAS SAND

The Sassafras sand, to a depth of 8 to 10 inches, is a light-brown, medium-textured sand with considerable coarse sand. The subsoil to a depth of 36 to 40 inches is a yellowish-brown sand. In some places there are small quantities of quartz gravel scattered over the surface, but the gravel is not present in sufficient quantity to change the character of the soil. The surface soil in some places, especially in wooded areas, dries out to a grayish brown. The subsoil is fairly uniform in color and texture. One variation occurs in a few areas near Harrison Ferry, where the subsoil is brownish yellow instead of yellowish brown or reddish yellow.

The Sassafras sand occurs in the northeastern quarter of the county, chiefly along Marshyhope Creek. Isolated areas are found here and there in the northern part of the county. The topography along the streams as a rule is gently rolling to flat, while in those areas away from the streams it is sloping, the soil occupying knolls or ridges. This type is very well drained, in fact rather excessively drained.

South of Brookview there are a few areas of Sassafras sandy loam and Sassafras loamy sand that have been included with the Sassafras sand. These areas are small and it was not practicable to map them separately.

The Sassafras sand is a well-drained, warm, early soil, well adapted to the production of vegetable crops especially for the early market. Fine tomatoes, watermelons, cantaloupes, asparagus, potatoes and sweet potatoes, and other crops can be grown. The yields depend largely on good management in the matter of maintaining a supply of organic matter in the soil and in the proper use of fertilizers. The yields of corn and rye are low, although where clover or cowpeas have been turned under as green manures

the following crop shows a decided improvement, even in seasons that would ordinarily be adverse. Hay is not altogether a satisfactory crop. Occasionally a good crop of cowpeas, crimson clover, or sorghum is produced. Dewberries and blackberries do well; strawberries are not so productive.

About half of this type is under cultivation. The other half supports a growth of loblolly pine, holly, oak, sweet gum and black gum (tupelo), and an undergrowth of sassafras bushes and briars.

The value of land of this type of soil ranges from \$30 to \$75 an acre, depending on location and improvements.

In order to improve the Sassafras sand it is necessary to incorporate organic matter. Very few soils respond more quickly to applications of barnyard manure and the turning under of green manures, particularly legumes, such as cowpeas and crimson clover. The organic matter should be added rather frequently and in considerable quantities because the soil is so thoroughly aerated and well drained that decomposition of organic matter takes place rapidly. This soil is easily tilled and responds well to the application of fertilizers.

SASSAFRAS LOAMY SAND

The Sassafras loamy sand is a transition type between the sand and the sandy loam of the series. The surface soil consists of 5 to 7 inches of light-brown to grayish-brown loamy sand. The subsoil is a yellowish-brown or a reddish-brown loamy sand, ordinarily somewhat more coherent than the surface soil. In places a thin layer of sandy loam is encountered in the subsoil, but this is not uniformly present. The sand substratum that is so conspicuous in most of these soils is not entirely absent in this type, but appears to lie at lower depths. Locally it is encountered within the 3-foot section; usually it is found just below 36 inches and is a sticky medium sand.

The Sassafras loamy sand is not very extensive in this county. It is confined to the northeastern part of the county, where it occupies many small scattered areas. The most extensive areas lie in the vicinity of Cabin Creek and Eldorado. Each of these contains 3 or 4 square miles. The other areas are considerably smaller.

The topography in the more extensive areas is slightly undulating, except near the streams, where it is somewhat rolling. In the smaller areas it is either level or ridgy. The ridge formation is especially noticeable where the type is associated with soils of the Elkton series. The drainage is excellent and in places excessive. Crops on this type stand wet weather very well, but suffer considerably from drought.

Because of its comparatively small extent the Sassafras loamy sand is not important in the agriculture of the county. About 80 to 85 per cent of it is under cultivation. The rest is forested with loblolly pine, oaks, sweet gum, black gum, dogwood, and some birch, beech, and hickory. The undergrowth is composed of sassafras bush, alder, huckleberry, and dewberry. When a field is abandoned, crab grass and pine seedlings soon take possession.

The same crops are produced on this type as on the Sassafras sandy loam, and the farming methods practiced are very similar.

The type is a well-drained, warm, early soil, and is especially adapted to the production of early vegetables. Planting can be done earlier than on the other soils in the county, except the Sassafras sand, and early planting makes it possible to market the crops earlier and therefore at better prices. This soil responds quickly to the application of barnyard manure and fertilizers, but as a general rule heavier applications are required than on the Sassafras sandy loam. Corn, potatoes, sweet potatoes, melons, cucumbers, cantaloupes, tomatoes, buckwheat, clover, and cowpeas are grown. The yields are nearly as high as on the Sassafras sandy loam.

Usually land of this type is sold in conjunction with some other type. Where the Sassafras loamy sand is the predominating soil, the price ranges from \$25 to \$100 an acre, depending on improvements and the nearness to shipping points and surfaced roads.

In order to increase production on this soil, liberal applications of organic matter in the form of stable manure or green manure should be made. These applications should be made rather frequently, because the soil is so thoroughly aerated and well drained that decomposition of organic matter takes place at a comparatively rapid rate. Legumes should be included in the rotation. It is sometimes difficult to grow legumes, but once a stand is obtained the crop can be successfully grown. Cowpeas do very well on this soil. The application of lime will prove beneficial.

SASSAFRAS SANDY LOAM

The surface soil of the Sassafras sandy loam is a light-brown sandy loam to a depth of 3 or 4 inches, underlain by a brownish-yellow sandy loam which extends to a depth of 15 to 18 inches. The subsoil from 18 inches to 30 inches is a yellowish-brown or reddish-brown friable sandy clay. In most places the substratum below 30 inches is composed of yellowish-brown or reddish-brown loamy sand, containing some small rounded gravel. The reddish-brown color of the subsoil is more pronounced in this type than in the lighter types of the series.

The Sassafras sandy loam is not uniform in texture and structure throughout the county. The brown surface layer in some areas extends to 6 or 8 inches. North of Cabin Creek the texture is a loamy sand for 18 inches before a typical sandy loam is encountered. In places the loamy sand substratum appears 15 inches below the surface. One of the most pronounced variations is in the vicinity of Hurlock and west of Rhodesdale. Here the soil is a typical sandy loam to a depth of 15 to 24 inches, where it grades into a gravelly loamy sand, which generally becomes somewhat coarser with increase in depth. These areas are conspicuous because of the absence of the sandy clay or clay loam usually found in the sandy loam type. This variation was mapped as sandy loam because it approached it nearer than it did the loamy sand type. In the vicinity of Williamsburg the loamy sand and sandy loam are so intermingled that it was impossible to map them separately; consequently some areas of loamy sand have been mapped with the sandy loam.

The Sassafras sandy loam occupies rather large areas in the vicinity of Beulah, Cabin Creek, Hurlock, and Rhodesdale. Very

few areas are found in the low-lying southern section of the county. Some of the most typical areas lie adjacent to the Choptank River. The topography as a rule is level to gently rolling. The smaller areas are commonly developed in irregular ridges not much higher than the surrounding soil. Where this type lies next to streams it does not break to the stream abruptly but passes down gradually. Exceptions to this general rule appear in the extreme northern part of the county.

The surface drainage of the Sassafras sandy loam is everywhere good, and on account of the coarse substratum the underdrainage also is thorough throughout the type. On the other hand, the retentiveness of the subsoil in most places prevents excessive drainage, and the soil is capable of maintaining a sufficient supply of moisture for healthy plant development.

The Sassafras sandy loam is among the best farming soils and also one of the most valuable trucking soils in the county. By many it is considered the most dependable and productive soil in the area, and is also best understood. About 85 per cent of it is under cultivation. The rest is forested with good stands of pine and a few oaks; the undergrowth consists of myrtle and some sassafras bushes, but as a rule is not very dense.

Corn, grass, potatoes, sweet potatoes, tomatoes, peas, beans, cantaloupes, watermelons, and some asparagus are the principal crops. The yields of all crops are good. The soil is especially productive for corn, sweet potatoes, tomatoes, and cantaloupes. Corn yields 30 to 65 bushels, and sweet potatoes 75 to 125 barrels per acre. Tomatoes and cantaloupes also yield heavily. Hay ordinarily yields $1\frac{1}{2}$ to 2 tons per acre.

The Sassafras sandy loam is easily tilled, as it does not clod when plowed wet or bake when dry. It responds very readily to the application of manures and fertilizers. This is probably one reason why this soil is carefully handled and soil-improving crops are grown. The cultivation of this type includes deep plowing and thorough seed-bed preparation. Modern machinery is used in all farm operations.

The Sassafras sandy loam has a higher value than any other soil used for agriculture. The prices range from \$75 to \$200 an acre. They are influenced by the state of improvement and the nearness to shipping points, canneries, and good roads.

Steps for improving the Sassafras sandy loam should include deep plowing, crop rotation, the growing of winter cover crops, and the application of manures and lime. This soil is now well handled on many farms, but the use of a definite rotation that includes some legume should be extended. Alfalfa does well on this type when lime has been applied, and four or five cuttings a season can be made. Introduction of this crop will not only increase the supply of hay, but also improve the soil. Where alfalfa has not been grown before the soil should be inoculated. Sowing in late summer or early fall is preferable to sowing in the spring. Conditions on the majority of farms in the county would be improved by increasing the number of livestock kept.

SASSAFRAS LOAM

The surface soil of the Sassafras loam is a grayish-brown to brown loam, with a depth of about 10 inches. The subsoil, to a depth of 30 to 34 inches, is a yellowish-brown, friable sandy clay. This is underlain by a brownish-yellow, sticky sandy loam. In a few places rounded quartz gravel is mixed with the soil and subsoil, but not in sufficient quantity to have any marked effect on the soil. About 1½ miles southwest of Walnut Landing a small area of Sassafras silt loam is included with the Sassafras loam.

The Sassafras loam is inextensive in this county. The individual areas are comparatively small and occur mainly in the northern part of the county, commonly near some of the larger streams. The most important areas are in the vicinity of Cabin Creek. The topography is rolling to gently undulating; in a few places it is ridgy. The drainage is good to excellent.

The Sassafras loam is among the more dependable general farming soils in the county. It is easily tilled and responds readily to fertilizers. Because of the heavier texture, it is easier to keep in a high state of productivity than the sandier soils. This type is especially suited to the production of corn, wheat, grass, clover, tomatoes, beans, and cabbage. Fair results are obtained with strawberries, cantaloupes, asparagus, and buckwheat. Corn yields 30 to 65 bushels per acre, wheat 18 to 35 bushels, and grass 1½ to 2½ tons of hay. Legumes yield well and should be included in every rotation. Because of the good yields of hay and forage, livestock is kept on this type more than on other soils in the county. Practically all of the type is cleared and under cultivation. The virgin forests contained pine, oaks, gums, maple, birch, and beech.

Land of the Sassafras loam is generally sold in conjunction with some other type. It has a lower price than the trucking soils but a higher price than the other soils used for general farming.

ELKTON SANDY LOAM

The surface soil of the Elkton sandy loam consists of a gray sandy loam, 5 to 7 inches deep. This is underlain, to a depth of 14 to 17 inches, by a subsurface layer of light-gray sandy loam. The subsoil to 30 inches is a gray, plastic sandy loam, mottled with yellow and rusty-brown stains. Generally below 30 inches a substratum of gray sticky sand, in most areas saturated with water, appears. There is considerable variation in the intensity of the mottling, which in some places is almost lacking.

Included with this type are several small areas of Elkton sand. These areas, which lie in the vicinity of Reids Grove, consist of a dark-gray surface soil, 12 inches deep, and a subsoil of loose gray sand.

The Elkton sandy loam is developed in the northern part of the county. The areas are irregular in shape and as a rule are small. Some occur in saucerlike depressions and around the heads of streams. The most important areas in this county are south of Gluckheim and Rhodesdale and southwest of Reliance, situated over the line in Sussex County, Delaware.

The topography is flat or slightly depressed. Many of the low-lying areas around streams and the flat areas between the natural drainage ways are of this type of soil. The drainage is poor, the water table very often being near the surface. The type receives the seepage water from surrounding higher and better drained soils.

About 65 to 75 per cent of this type is forested with a second growth of loblolly pine, oak, black gum, sweet gum, and holly, with an undergrowth of myrtle, huckleberry, and bull brier.

This is one of the less important soils of the county, on account of its small extent and lack of drainage. Strawberries, sweet potatoes, corn, and hay are the principal crops. Occasionally the crops are destroyed during periods of excessive rainfall, and they also are affected seriously by periods of drought. The average crop yields are lower than on the Sassafras and Keyport soils. During a good year, however, the yields compare favorably with those of the better drained soils. Cover crops are likely to be heaved out by freezing. This type is handled in the same manner as the better drained soils, except that probably a little more care is taken with regard to the condition of the soil when it is to be worked.

The most important step in the improvement of the Elkton sandy loam is the establishing of adequate drainage. This can be done by digging open ditches or laying tile drains and by deepening and clearing the natural drainage ways. Very little tiling has been done in this county, and it is a question whether the expense would be justified. Where fair to good drainage has been established this soil is benefited by the addition of lime and organic matter. The rotation should include some legume that is suitable. The plowing under of a green cover crop is beneficial.

ELKTON LOAM

The surface soil of the Elkton loam is a gray to grayish-brown loam with a depth of about 3 inches, underlain to about 9 inches by a light-gray loam containing a few brown mottlings. The subsoil is mottled light gray and brown, with gray the predominating color, and the texture grades from a heavy loam to silty clay loam. Below 28 to 32 inches the sand stratum, which is characteristic of all these soils, is encountered. It is a gray, sticky sand, saturated with water. There are included with this type a few small areas of Elkton sandy loam and Elkton silt loam. The Elkton sandy loam occurs in small narrow ridges; the silt loam occupies irregular-shaped areas that are too small to be shown on the map.

This type is not very extensive in the county. In places it is a marginal soil between the Elkton silt loam and the better drained soils; in other places it occupies depressions in the better drained soils or ridges in the Elkton silt loam. The largest areas in this county lie southeast of Cambridge. Small areas are scattered throughout the northeastern part of the county.

The topography of the larger bodies is flat, the small areas associated with the better drained soils are saucerlike, and those in the Elkton silt loam are usually ridgy. The drainage is characteristically poor. A few farms on the type have been brought to a high state of development. These have been drained by ditches. About half of the type is under cultivation. The part in forest is covered

with a second growth of pine, oak, maple, and gum, with undergrowth of myrtle and huckleberry.

The principal crops are corn, wheat, potatoes, and hay. The yields are lower on an average than on the better drained soils, but in years when the rainfall is moderate the soil compares favorably in yield with the Sassafras and Keyport types. Crops are likely to drown in periods of excessive rainfall and to dry up in drought. Winter cover crops are sometimes heaved out by freezing and thawing.

Farm land on the Elkton loam sells for \$20 to \$100 an acre, the price depending upon drainage, improvement, and location with regard to markets, shipping points, and roads. The small areas are commonly sold in connection with other soils, which govern the price.

In order to yield well this type requires improved drainage. When drainage is established, the addition of organic matter, either as pine straw, barnyard manure, or green manure, is recommended. This type is slightly acid and the addition of lime would be beneficial. A leguminous crop that is suited to this soil should be included in the rotation.

ELKTON SILT LOAM

The surface soil of the Elkton silt loam is a gray or brownish-gray mellow silt loam to a depth of 6 to 8 inches. On forested areas there may be a thin veneer of dark material. The subsoil to about 30 inches is a mottled gray and brownish-yellow, slightly plastic, silty clay loam. Below 30 inches there is a substratum of gray, slightly plastic fine sand, which is usually water-soaked. The surface soil when dry has a flourlike appearance; when wet, especially where it contains considerable organic matter, the surface soil has a brownish cast. The mottlings in the subsoil vary somewhat; in a few locations the yellow and rusty-brown stains are more numerous; in all places, however, the gray color predominates. Another variation in the subsoil consists of a layer, appearing at about 28 inches, of a bluish or lead-colored silty clay. In a few instances this layer has a thickness of 4 to 8 inches. This variation was noted especially just south of Cambridge. In the wooded areas the subsoil is more uniformly gray than in the cultivated fields.

The Elkton silt loam covers a larger area than any other soil type in the county. Including its low phase, the type occupies nearly half the county. It is developed mainly in the central and western parts. The typical soil extends southward to the Tidal marsh, except where the Elkton silt loam, low phase, occurs as a border soil between it and the marsh. The elevation ranges from 2 to 35 feet above sea level, most of the land lying between 6 and 10 feet. The highest elevation in the type is southwest of Rhodesdale. This type is also found on some of the islands off the mainland.

The topography is generally flat. Detached areas are commonly depressed. Some of the wooded areas are somewhat hummocky, apparently as the result of the uprooting of trees. Another variation in the topography consists of narrow ridges only a few inches higher than the surrounding soil. On these ridges the soil is slightly sandy in texture and better drained than the surrounding soil. The sandy areas are small, rarely containing more than an acre of land.

The drainage of this type is poor, though somewhat better than that of the Elkton silt loam, low phase, because of the slightly higher elevation of the former. However, the water table over a very large proportion of it is quite near the surface, and very often the lower part of the 3-foot section is saturated.

A part of this type can not be developed unless considerable diking, ditching, or tiling is done. In a number of places the drainage is difficult because the situation of the area is but little above sea level. In these places it would not be wise at the present time to incur the expense necessary to provide adequate drainage. At present open ditches are the only means used to drain this type. In some places, where there is sufficient fall, good results are obtained, but where the fall is slight ditches are less effective. Locally this type grades into the Tidal marsh, with no decided descent, and in such places dikes are the only effective means of reclamation. Up to this time few have been built.

The Elkton silt loam is locally known as "pipe-clay land." In extent it is by far the most important soil in the county. Probably not much more than 25 per cent of it is under cultivation; the rest is forested with gum, soft maple, loblolly pine, oaks, holly, and an undergrowth of myrtle, huckleberry, and other bushes and shrubs. Practically all the larger merchantable timber has been removed, but sawmills scattered over this area are making crates and hampers out of the better of the remaining trees. The tree growth near the salt marshes is nearly always stunted and of little value.

General farming is practiced on this type. The crop yields average lower than on the better drained Keyport and Sassafras soils. In good seasons, however, when the rainfall is favorable—that is, when it is below normal—they compare favorably with those on the better drained land. Occasionally winter crops are injured or destroyed by heaving. As a rule care is exercised to handle this soil when the physical conditions are right, as it is very easily clodded. Plowing is usually done later in the spring than on the better drained soils.

The principal crops on the Elkton silt loam are wheat, corn, and hay. The wheat yields range from 12 to 25 bushels per acre, corn produces 20 to 30 bushels per acre, and hay about 1 to 1½ tons. Some potatoes are planted, and in good seasons fair yields are obtained. Practically no attempt is made to produce truck crops. The persons living in the part of the county where this soil predominates do not depend entirely on farming for a livelihood; some of them devote a part of their time to fishing, crabbing, oystering, and muskrat trapping.

The value of the Elkton silt loam ranges from \$10 to \$75 an acre, prices depending on drainage conditions, the improvements, and location with regard to roads. The value of forest also affects the prices markedly.

The most essential step in the improvement of this land is drainage. Up to the present time little of the land has been underdrained. Such reclamation work as has been done consists in deepening and extending the natural drainage ways and the digging of ditches leading into these. A considerably greater proportion of the type can be brought into fairly good condition in this way at relatively small expense. Until good drainage is established, efforts

to build up productiveness of much of this soil will be largely wasted. With good drainage established this soil will be greatly benefited by plowing under pine straw, coarse stable manure, and cover crops, all which have a tendency to loosen the soil and improve the aeration. Liming should be practiced more extensively. The growing of some legume suitable for this section should be included in the rotation. With proper care this soil can be made quite productive and fairly reliable.

Elkton silt loam, low phase.—The Elkton silt loam, low phase, is composed of gray silt loam, with a depth of about 4 inches, underlain by a mottled gray and yellow plastic silty clay loam. In the wooded areas the surface soil has a slightly brownish cast and is generally covered with about an inch of vegetable mold. In places the subsoil contains small pockets of brownish silty clay. The lower part of the subsoil usually contains sufficient sand to make it somewhat friable. The subsoil of this phase is generally heavier than that of the type. As the soil of the Elkton silt loam and of this phase pass into each other very gradually, the placing of boundaries between them has necessarily been arbitrary, and each may contain small areas of the other.

The principal difference between this phase and the typical soil is the uniformly low position occupied by the phase, its very poor drainage, and its close association with Tidal marsh.

The topography is flat. In some places there are slight depressions within the phase. These contain water for considerable periods in wet seasons and are semiswampy. The soil in these depressions does not differ materially from the rest of the low-phase areas. This phase lies but a few inches to 4 feet above sea level, the average elevation being about $1\frac{1}{2}$ or 2 feet. There is in many places not sufficient fall to carry off the water after rains, and water stands on the surface until absorbed or evaporated. In draining parts of this phase dikes and tide gates will be required. Open ditches are satisfactory on the higher parts of the phase.

The low phase supports a growth of loblolly pine, maple, oak, holly, and an undergrowth of myrtle, huckleberry, grass, and shrubs that thrive on a moist soil. Very little of it is cleared. The cleared areas are usually small patches around houses which are usually planted to corn or vegetables for home use. Corn does well where the land is not too wet. The inhabitants on this phase do not depend on agriculture for a living. Fishing, crabbing, oystering, and trapping are their main sources of income.

Land values on this phase are much lower than on the typical Elkton silt loam. It can not be made good agricultural land until adequate drainage is provided, and it is probable that the expense of drainage would hardly be justified in the present stage of settlement. The best use of the land is for forestry or pasturage.

KEYPORT SANDY LOAM

The surface soil of the Keyport sandy loam is a brownish-gray sandy loam to a depth of 6 inches, underlain by a grayish-yellow heavy sandy loam, with traces of mottling, which extends to a depth of 12 inches. The subsoil from 12 to 30 inches is a mottled gray and yellow friable sandy clay, which passes at 30 to 36 inches into

a substratum of yellowish-gray sticky sand. In places the gray and yellow sandy clay extends through the 3-foot section. This type differs from the Sassafras sandy loam principally in that it is less well drained and that the subsoil is mottled. It differs from the Elkton sandy loam in that it is much better drained and the subsoil is more highly oxidized, giving it a yellowish color.

The Keyport sandy loam is developed in small irregular areas scattered over the northeastern part of the county. One of the largest areas is south of Brookview. Generally it is an intermediate type between the Elkton and the Sassafras soils, but in this county a large part of it borders the Sassafras. The type is either flat or occupies saucerlike depressions in the Sassafras soils. The drainage is fair. Most areas are so situated that they could be drained with very little trouble. About 70 per cent of this type is under cultivation; the remainder bears a good stand of loblolly pine, oak, sweet gum and black gum, and an undergrowth of myrtle, huckleberry, briars, and shrubs.

This type is very similar in crop adaptation to the Sassafras sandy loam. The yields in some instances are as high as on the Sassafras, but average, over a period of years, somewhat lower, because the crops do not do as well on the Keyport in wet seasons. This type is managed in the same manner as the Sassafras sandy loam. Land of this type is usually sold in conjunction with other soils.

The first step to improve this type is drainage, which is usually accomplished by open ditches. Tile drains have been used successfully on this soil in other counties, but so far not in Dorchester County. Leguminous crops can be grown on the better drained areas. Lime and coarse manures incorporated in the soil increase its productiveness.

KEYPORT SILT LOAM

The Keyport silt loam is a grayish-brown or grayish-yellow silt loam to a depth of 6 to 8 inches, underlain to about 15 inches by a yellowish-brown to yellow heavy silty clay loam. Below 15 inches it grades into a mottled yellow, rusty-brown, and gray heavy silt loam. In places between 20 and 30 inches a stratum of gray or yellowish-gray sticky sand is encountered and in other places the sand stratum is absent and the lower subsoil has a bluish cast.

The Keyport silt loam is not very extensive. The largest areas are in the southeastern and central parts of the county, where they are closely associated with the Elkton silt loam. The topography is generally level. The drainage is fair. The type is better drained than the Elkton, but not as well drained as the Sassafras. Where this type is under cultivation, ditches are used to assist in the removal of drainage water.

This is considered a fairly good soil in the section in which it is found, for it does not suffer in comparison with the Elkton silt loam, which is not so well drained. Over half of it is cleared and cultivated. It is usually planted to corn, wheat, grass, or potatoes. In average seasons fair yields are obtained, and in dry seasons the yields are good. The soil is a little too heavy for use in growing truck crops.

The forest on this soil consists of loblolly pine, oak, black gum, and sweet gum, and a dense undergrowth of myrtle, huckleberry, and briars.

Land values on the Keyport silt loam range from \$10 to \$70 an acre, depending on location, improvements, and the possibility of drainage.

Areas of this soil can be improved by drainage, the application of lime, and the introduction of a leguminous crop in the rotations. The application of lime may range from 1,500 to 2,000 pounds of burnt lime or 1 to 1½ tons of ground limestone. This soil is also deficient in organic matter; therefore coarse manure would prove beneficial.

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

Mechanical analyses of Keyport silt loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>						
202132	Surface soil, 0 to 8 inches.....	0.6	0.8	0.8	7.1	13.0	56.7	20.9
202133	Subsoil, 8 to 24 inches.....	.2	.2	.4	3.4	15.9	58.4	21.4
202134	Subsoil, 24 to 36 inches.....	.1	1.9	2.3	22.6	14.4	38.3	20.4

NORFOLK SAND

The Norfolk sand consists of a surface layer of gray to brownish-gray sand, underlain at 3 to 5 inches by a yellow sand that extends to depths of 3 feet or more. Included with this type are a few small areas of Norfolk loamy sand and Keyport sand, which differ slightly from the Norfolk sand. The Norfolk loamy sand contains more fine sand and silt, and this gives it a loamy feel. The Keyport sand has a mottled gray and brown subsoil. These included areas are not large or numerous and their boundaries are indefinite; hence they were not mapped.

The Norfolk sand is an early soil and responds readily to the application of fertilizers, but, because of its open structure, the effects of fertilization or manuring are not lasting. The Norfolk sand is used in the production of corn, sweet potatoes, and vegetables. The yields of all crops are low. In sections where there are heavier soils that can be cultivated, the Norfolk sand is generally allowed to remain in forest. The forested areas contain pine, oak, tulip poplar, and an undergrowth of huckleberry, myrtle, and briars.

Land of the Norfolk sand type ranges in price from \$20 to \$50 an acre. It is often included in farms with some of the better soils, which tend to enhance its price.

This soil is very greatly in need of organic matter. This should be incorporated either in the form of barnyard manure or by turning under leguminous crops or rye. Rye does very well as a cover crop. When well supplied with organic matter and heavily fertilized, fair yields of potatoes, sweet potatoes, cucumbers, watermelons, cantaloupes, and other truck crops can be obtained. A distinct advantage of the type in trucking is its earliness.

PORTSMOUTH LOAM

The surface soil of the Portsmouth loam is a spongy black loam 9 to 12 inches deep. It is very high in organic matter, and quite frequently the upper few inches approach muck in character. The subsoil to a depth of 24 inches is a light-gray, mottled with yellow, sticky, plastic sandy clay. This is underlain by a similarly colored sticky sand or sandy loam which extends to 36 inches or more and is usually wet.

The largest area of Portsmouth loam in this county lies between Finchville and Harrison Ferry. Other areas are scattered over the county, usually in association with some of the low-lying soils or in depressions.

The Portsmouth loam has a flat, level topography. Its typical position is in saucerlike depressions of poor drainage. It has been developed under swampy conditions, which have favored the growth of a rank vegetation and the accumulation of its remains.

Only a very small part of this type has been brought under cultivation. Potatoes and corn are the main crops. The rest of the type supports a good forest of pine, oak, black gum, and sweet gum, with a heavy undergrowth of huckleberry, bullberries, myrtle, and other shrubs and grasses.

In order to fit the Portsmouth loam for farming it is necessary to provide drainage. Where it has been reclaimed in other regions it has proved a good soil for growing corn, cabbage, onions, and strawberries. When drained the land should receive heavy applications of lime.

MEADOW

Meadow comprises semiswampy alluvial soils that vary greatly in texture or color. In this county the surface soil ranges from a sandy loam to a silt loam in texture and is usually gray to dark gray in color. The subsoil is usually a gray, mottled with brown, silt loam to silty clay loam. It is in many places water-logged.

Meadow occupies narrow strips along streams and around the heads of streams, principally in the northern part of the county. During the winter and early spring these areas are commonly in a swampy condition, and water stands on them a large part of the time, but during the summer and fall they are accessible.

A large proportion of this alluvial land would be fairly easy to reclaim by straightening the stream channels and by keeping the channels free from fallen trees and brush. When thoroughly drained, Meadow gives good yields of corn. At present the land is used mainly for pasture, and this is undoubtedly the best use for it. The forest includes oak, pine, black gum, and sweet gum, myrtle bushes, and briers.

TIDAL MARSH

Tidal marsh includes the areas lying near sea level and subject to inundation by tides. The soil material usually is a dark-gray to brownish-gray, slimy, sandy loam to loam or silt loam. The surface soil generally contains many roots of marsh grass and much partially decomposed vegetable matter. The subsoil material is a gray, rather heavy, clay loam with some brown mottlings.

Tidal marsh in Dorchester County occurs in extensive areas along Fishing Bay and the Nanticoke River and on some of the islands in Chesapeake Bay. It also occupies a few small areas along the smaller estuaries. The bodies of marsh are irregular in shape and are cut up by numerous meandering sloughs.

Tidal marsh has no agricultural value. It supports a rank growth of marsh grasses and a few shrubs or salt-water bushes. Some areas are solid enough for pasture, but the pasturage is not very good.

Tidal marsh, high phase.—Tidal marsh, high phase, represents an intermediate stage between the low-lying Elkton soils and the typical Tidal marsh and has some of the characteristics of both. The texture of the surface soil varies considerably. In some places it is a sandy loam, in others it is a silty clay loam. The color ranges from gray to dark gray mottled with brown. The surface soil resembles the Elkton, except that it usually has a large amount of decaying vegetable matter in the first few inches. The subsoil is a blue, slimy, silty clay loam. The phase resembles the Elkton silt loam, low phase, except that the high phase of Tidal marsh is subject to overflow by extremely high tides.

Tidal marsh, high phase, is mapped where the mainland slopes gradually to the Tidal marsh level and also on slight elevations within the typical marsh. A few such elevations are included with the typical Tidal marsh because they are inaccessible.

This phase usually occurs in scattered areas on the land side of the typical marsh. In places, especially on some of the islands, it extends to the water's edge. The phase contains a stand of scattered stunted pines, myrtle bushes, and marsh grass. At present the land is used only for pasturing cattle.

SUMMARY

Dorchester County is in the southeastern part of Maryland, on the Eastern Shore. It has an area of 576 square miles.

Three physiographic divisions are developed—the better drained upland; the low, flat, poorly drained soils; and the tidal marshes. The topography is prevailingly level, but varies from low and flat in the foreland country to gently undulating in the upland plain, whose elevation does not exceed 60 feet. Drainage in the upland country is fairly well established.

The county is one of the earliest settled regions in the United States, having been continuously occupied since about the middle of the seventeenth century. The present population (1920) is 27,895, of which 7,467 is classed as urban.

The railroad transportation facilities are good. The earth roads are good during the summer. State roads, mainly of concrete, extend to practically all sections of the county, and the mileage of improved roads is increasing. Most farms are supplied with modern conveniences.

The climate is moderate. The annual temperature averages 56.6° F. The winters are usually mild. The mean annual rainfall is 44.17 inches. The rainfall is distributed evenly over the growing season. The frost-free season averages about 212 days.

Dorchester County has always been an agricultural section. Both general and truck farming are now followed. The main crops are

corn, wheat, hay, potatoes, sweet potatoes, oats, tomatoes, peas, cantaloupes, and watermelons. The livestock industries are not developed to any marked extent. Hogs and poultry are kept on practically all farms, but not ordinarily in large numbers.

Modern methods of cultivation are used. Farm equipment is modern, rotations are in general use, and large quantities of commercial fertilizer and manure are used.

There are 2,019 farms in the area, as reported by the 1920 census, and they average about 100 acres per farm. Farm land values range from \$15 to \$225 an acre according to the kind of soil, drainage, condition of buildings, and location with respect to good roads and shipping points.

Two distinct classes or groups of soils are found in Dorchester County, the brown soils in the northern part and the gray or brownish-gray soils in the southern part. The soils in the southern part have very poor drainage, and the lack of oxidation largely accounts for the gray color. The soils are either neutral or slightly acid. The light-colored soils of the Elkton series are usually acid, while the well-drained Sassafras soils are practically neutral. The soils are developed upon two distinct geological formations—the Wicomico and the Talbot. The weathering of these materials has given rise to 11 types of soil, which represent 5 soil series. In addition, the 2 miscellaneous types, Meadow and Tidal marsh, have been mapped.

The Sassafras sand occurs in the northeast quarter of the county, chiefly along Marshyhope Creek. This soil is well drained, warm, and early, and well adapted to trucking.

The Sassafras loamy sand is developed in small areas in the northeastern part of the county. It is used for general farming and responds readily to good treatment.

The Sassafras sandy loam, which is found in the northern part of the county, is considered the best trucking soil in the area. It is well drained, easily handled, and produces good yields. About 85 per cent of it is under cultivation.

The Sassafras loam, which is not extensive, occurs in the northern part of the county near the larger streams. It is the most dependable general farming soil in the county, is easily tilled, and responds readily to fertilizer. Practically all of it is cleared and under cultivation.

The Elkton sandy loam is found in the northern part of the county in areas of irregular shape and flat or slightly depressed topography. About two-thirds of it is forested. Strawberries, sweet potatoes, corn, and hay are the principal crops. Because of the poor drainage this type is not altogether dependable.

The Elkton loam is flat and poorly drained and is not considered a very good soil. The principal crops are corn, wheat, potatoes, and hay.

The Elkton silt loam is the soil of largest extent in the county. It occupies large areas in the central, western, and southern parts of the county. Drainage is typically poor, the surface being flat and only a few feet above sea level. General farming is carried on, but the soil is not altogether dependable. The low phase is similar to the Elkton silt loam, except that it has a lower elevation and is more poorly drained.

The Keyport sandy loam is found in small irregular areas scattered over the northeastern part of the county. Generally it is an intermediate type between the Elkton and Sassafras soils. It is similar to the Sassafras sandy loam in crop adaptation, but the average yields are not as high.

The Keyport silt loam is not extensive. It is generally level, has fair drainage, and is considered a rather good soil in the section in which it is found. Over half of it is under cultivation and is usually planted to corn, wheat, grass, or potatoes.

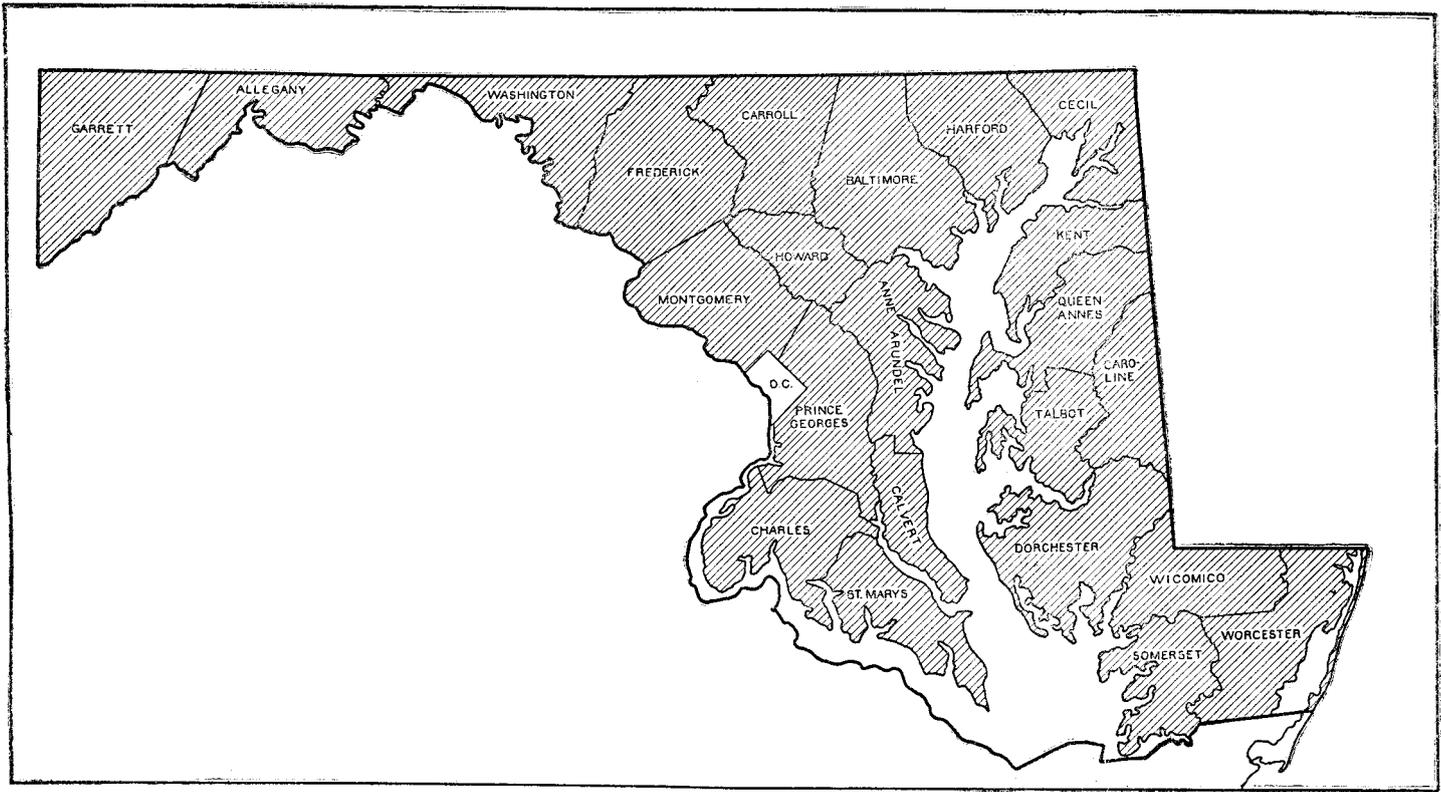
The Norfolk sand is rather droughty and is not considered a good agricultural soil. It produces only fair yields, and where heavier soils can be cultivated it is allowed to lie idle.

Portsmouth loam occurs in scattered areas, usually associated with some of the low-lying soils or in depressions. Very little of it is under cultivation. The type supports a good growth of pine, oak, black gum, and sweet gum, with a dense undergrowth.

Tidal marsh is composed of extensive salt marshes along the bay shore and extending up the estuaries into the interior. It has very little, if any, agricultural value in its present condition.

Meadow consists of semiswampy alluvial soils that have no uniformly definite texture or color. It is found in narrow strips along streams. A large proportion of this land could be reclaimed.





Areas surveyed in Maryland, shown by shading

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