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SOILS OF THE EASTERN UNITED STATES AND THEIR USE—I.

THE NORFOLK FINE SANDY LOAM.

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SOILS OF THE EASTERN UNITED STATES AND THEIR USE—I.

THE NORFOLK FINE SANDY LOAM.

GEOGRAPHICAL DISTRIBUTION.

The soil type known as the Norfolk fine sandy loam extends from Virginia southward along the Atlantic Coast to northern Florida and thence westward through the Gulf region into eastern Texas. Soil surveys throughout this region have included a total of 4,346,672 acres of this soil type, occurring in 63 different areas located in nine different States. The Norfolk fine sandy loam is only found within the Coastal Plain section of the United States and at elevations varying from slightly above sea level to an extreme altitude of about 350 feet. The greater part of the type, however, lies at altitudes of 25 to 200 feet. Its geographic extent covers many million acres, as has been indicated by the soil surveys already made. It is one of the most important types of soil within the region, both from the standpoint of the production of special crops and of general farm crops.

Since the character of crop which may be grown in any particular locality depends primarily upon the climate of that locality and upon the soil, it follows that the crops best suited to production upon the Norfolk fine sandy loam will vary from place to place as the climatic surroundings of the soil type vary. Thus the localities within which the Norfolk fine sandy loam is principally developed may, for convenience, be divided into four principal regions.

The first of these is the Middle Atlantic section, including the States of Virginia and North Carolina. The second is the South Atlantic section, including South Carolina, Georgia, and northern Florida. The third is the Eastern Gulf section, including Alabama, Mississippi, and the portion of Louisiana east of the Pearl River. The fourth is the Western Gulf section, including the northern portion of Louisiana and the east Texas timbered region.

These different regions differ to some extent in the length of growing season and the average temperatures which are maintained during the growing season, but they probably differ to a greater degree in the amount of rainfall which occurs, both throughout the year and especially throughout the growing season. For these reasons and for others which will appear the crop adaptations of the different sections differ slightly.

CHARACTERISTICS OF THE SOIL AND SUBSOIL.

The surface soil of the type consists of a pale-yellow or light-gray fine sandy loam, which usually extends to a depth of 6 or 8 inches. This is underlain by a light-yellow, fine sandy loam subsoil, which grades downward into a yellow light sandy clay at an average depth of about 18 inches. In local areas this yellow fine sandy loam extends to a depth of 24 to 30 inches and such areas are usually less productive than the average of the type. The surface soil may range in color from a dark gray or almost brown where it is well filled with organic matter, as in slight depressions or in carefully tilled fields, to a pale yellow or light gray where there is a deficiency of organic matter at the surface. In tracts where the surface vegetation has been burned off or where clean cultivation has been practiced for a considerable time the surface soil tends to be light gray or almost ashy white. Occasionally small white quartz pebbles or rusty iron concretions and pebbles may be found in both the surface soil and subsoil.

The deeper subsoil is usually a friable yellow sandy clay, which extends from a depth of 18 to 36 inches or more. In locations where the natural drainage is poor the color of the subsoil at greater depths becomes mottled gray and yellow or mottled gray and red. In locations where drainage is so deficient that the production of crops is not advisable under ordinary circumstances the deeper subsoil may have an almost uniform gray color.

The Norfolk fine sandy loam is marked by the gray color of the surface soil and the yellow color of the subsoil. It thus differs from the Portsmouth fine sandy loam, which has a dark-brown to black surface soil, and from the Orangeburg fine sandy loam, which has a gray surface soil and deep red subsoil. These distinctive colorations are characteristic of the respective series.

The Norfolk fine sandy loam differs in texture from the other members of the Norfolk series. The Norfolk sand consists of a yellow medium sand soil and subsoil; the Norfolk fine sand, of a yellow fine sand soil and a yellow loamy sand subsoil, underlain by yellow sandy clay. The Norfolk sandy loam possesses a medium to fine yellow sandy soil underlain by a yellow sandy clay subsoil.

Thus the Norfolk fine sandy loam may be distinguished by its texture from the other members of the Norfolk series and by the coloration of soil and subsoil from types of other soil series.

SURFACE FEATURES AND DRAINAGE.

In general the Norfolk fine sandy loam occurs upon upland areas between the larger streams, and its surface varies from almost flat to gently rolling or undulating, with slight rises and hillocks, which are

frequently somewhat more sandy than the normal condition of the type. At higher elevations near the inland margin of the Coastal Plain the topography frequently becomes more rolling or even hilly. Slight surface depressions and the margins of "bays" and swamps are not infrequently poorly drained, while the more extensive flat areas would frequently be benefited by the establishment of open ditches bordering the cultivated fields. These ditches are easily constructed, and the banks can be maintained without great labor if they are made sufficiently sloping when the ditches are first dug. With these exceptions the Norfolk fine sandy loam is a well-drained and warm soil. At the same time the presence of the sandy clay subsoil at a depth not usually exceeding 18 inches tends to maintain a favorable moisture supply within reach of the growing crops and also prevents any leaching effect in the case of the application of fertilizers. In those areas where a favorable amount and condition of organic matter in the surface soil is maintained the soil is distinctly loamy and possesses very favorable conditions of texture and structure both for ease of cultivation and for the maintenance of proper moisture supply.

LIMITATIONS OF YIELDS.

In the general discussion of the Norfolk fine sandy loam and its uses it must be held in mind that there are certain limitations to the yields of the various crops which are suited to the soil in the different localities where it occurs. The limitations apply to practically all of the crops produced, and are inherent with the characteristics of the soil itself rather than with the character of the crops.

With the general farm crops, particularly cotton and corn, the principal limitations upon the yields which may be secured seem to lie in the care with which the land is prepared for the crop, in the amount of organic manure which may be supplied for the production of the crop, and in the care exercised in the frequent tillage of each of these crops during the growing period.

IMPROVEMENT IN CROP YIELDS.

A crop rotation which will permit of the introduction of some leguminous crop, like cowpeas or peanuts, into the rotation and which will provide also for a winter crop to prevent the washing of the soil invariably increases the yields of both corn and cotton above the normal for the region.

The application of complete commercial fertilizers, particularly those containing a fair percentage of potash in their composition, is also attended with profitable increases in the crop.

Upon the lands which are excessively level or slightly depressed, thorough artificial drainage, either by the less expensive means of

open ditches or by the better but more costly installation of tile-drainage systems, is essential to the production of satisfactory crop yields. Where the value of the land and of the crops to be produced will justify it the complete underdrainage of the wet portions by tile is to be preferred.

On the other hand, where the depth of the surface sandy soil or subsoil exceeds 2 feet, the incorporation of additional organic matter is required, in order to raise the moisture-holding capacity of the soil sufficiently to insure good yields.

In the production of either cowpeas or peanuts the application of lime to the soil before the planting of the crop is to be recommended.

LIMITATIONS UPON SPECIAL CROPS.

For the production of truck crops the Norfolk fine sandy loam in all of its locations is available, provided the distance of the particular field from lines of through transportation to the selected market is not too great. It is also essential that the lighter textured and warmer phases of the soil having a depth of 12 to 24 inches to the subsoil should be chosen. In general the Norfolk fine sand or the Norfolk sand should be selected for the extensive production of such crops. Heavy fertilization with organic manures and special mineral fertilizers are prerequisite. Cabbage constitutes the only exception to the first rule, in that the cabbage crop may best be grown upon soils moderately drained and particularly well supplied with organic matter. Hence the Norfolk fine sandy loam is more successfully employed for cabbage production than for almost any other form of trucking.

EXTENT OF OCCUPATION.

In the Middle Atlantic section the greater part of the entire area of the Norfolk fine sandy loam is cleared and cutivated and constitutes one of the most prized general-farming soils of the section. Where transportation facilities are the best, special truck crops are also produced, although the Norfolk fine sand or the Norfolk sand should usually be selected for the earlier truck crops. In the South Atlantic section a smaller proportion of the total extent of the type is cleared and cultivated, although the soil is highly esteemed and increasing areas are being brought under cultivation each year. In the trucking sections practically the entire acreage of this soil type, particularly in eastern South Carolina, is utilized for the growing of these crops. In southern Georgia and northern Florida areas of the medium deep phase are in considerable demand for the production of the shade-grown Sumatra wrapper tobacco.

In the Eastern Gulf section more than half of the total acreage of the Norfolk fine sandy loam is still uncleared and not under cultiva-

tion. The portions which have been cleared are held in fair esteem for the production of general farm crops. The trucking business is only becoming established locally at a few points. Immediately along the Gulf coast, however, the planting of pecan orchards within the past few years has been quite general.

In the western Gulf coast region, particularly in northwestern Louisiana and in the east Texas Timber belt, there remain vast areas of this soil type uncleared and uncultivated, although considerable value is attached to the soil for general-farming purposes. Its development as a trucking soil and for peach orcharding has been begun in northeastern Texas.

TILLAGE REQUIREMENTS.

It is usually not deemed necessary in the cultivation of the Norfolk fine sandy loam to use either heavy teams or powerful farm machinery. The surface soil is easily broken and turned, and the lighter weight teams and implements give satisfactory results. In fact the more sandy phases should not be plowed to any great depth, but the tillage operations should tend toward packing the soil, in order to give it added moisture capacity and ability to retain both water and fertilizers. Shallow and frequent cultivation for all intertilled crops are required, in order to establish a surface dust mulch to prevent evaporation of moisture. The greatest need of the Norfolk fine sandy loam for increased crop production is probably the incorporation of organic manures, either in the form of well-rotted stable manure or in the form of green cover crops turned under a considerable time before the succeeding crop is to be planted. This is requisite, in order to permit thorough decay of the green crop. The addition of 1,000 pounds or more of lime per acre in this connection is deemed advisable. For the same reasons it is considered desirable to include some leguminous crop in the farm rotation. Throughout the region cowpeas grow upon this soil to good advantage.

In certain sections peanuts constitute a good money or forage crop, while in south Georgia, Florida, and Alabama the velvet bean may well be used for this purpose. The use of cotton-seed meal as a source of nitrogen in the application of fertilizer is also to be recommended under most conditions. The use of mineral fertilizers is found to repay the expenditure when sufficient quantities are applied. The character of fertilizer to be used will depend upon the kind of crop to be raised and upon the previous treatment of the particular field or farm. In general it has been found that commercial fertilizers containing 8 to 10 per cent of phosphoric acid, 2 to 4 per cent of potash, and 2 to 3 per cent of ammonia give satisfactory results with

the general farm crops. It has been found that the muriate of potash gives particularly good results upon this and certain associated soil types.

CROP ADAPTATION.

Important uses in the Middle Atlantic section.—The Norfolk fine sandy loam is adapted to the production of both the yellow and white varieties of dent corn and they are grown almost universally in the Middle Atlantic section. Upon properly prepared land the yields secured by the best farmers vary from 20 to 35 bushels per acre, while upon land that has received less careful preparation the yield may sink as low as 12 to 15 bushels per acre. If proper methods of tillage and fertilization are followed, however, there is no necessity for the lower yields, and yields greatly in excess of those reported may be secured. It is not the equal of the Portsmouth silt loam as a corn soil, although excelling most of the other soils of the section in this respect. Cowpeas are grown either as an independent forage crop or else sown with the corn. Where the crop is grown alone yields of 1¾ to 2 tons of cowpea-hay may be secured. If the peas are thrashed, yields of 10 to 12 bushels per acre may be obtained. The use of cowpeas, either sown alone or between the rows of corn, is gradually being extended throughout the section. It gives rise not only to the production of an excellent forage crop, but also tends to increase the crop-producing power of the soil for other crops grown in the rotation.

The Norfolk fine sandy loam is one of the best soils which can be found in the Middle Atlantic Coastal Plain for the production of the bright lemon-yellow cigarette tobacco. The yields of this tobacco range from about 500 pounds to 1,200 pounds per acre. The latter yields are only secured upon the more loamy phases of the type, and where the land has been carefully prepared and well fertilized. The smaller yields are usually secured upon portions of the type where the depth to the sandy clay subsoil exceeds 24 inches, or where the soil has been badly managed and insufficiently fertilized.

The Norfolk fine sandy loam is well adapted to the production of peanuts, and they are coming to be extensively grown in eastern Virginia and eastern North Carolina. Both the Spanish variety and the Virginia variety are grown. The former produces from 30 to 60 bushels of nuts per acre; the latter from 50 to 100 bushels. Peanuts are grown in this section principally for the nuts, although some farmers are using the nuts and vines for fattening hogs, introducing the crop into their regular rotation for this purpose and for the purpose of increasing the crop-producing power of the soil.

Cotton is raised to a limited extent in extreme southern Virginia and extensively throughout eastern North Carolina upon the Norfolk

fine sandy loam. In the latter State it is the principal money crop, with bright tobacco second in importance. The yields of cotton naturally vary with the care which the land has received and with the degree of fertilization. In general, however, the Norfolk fine sandy loam produces from one-third to 1 bale of medium Upland cotton per acre. This is decidedly above the average yield for the section and marks the Norfolk fine sandy loam as one of the best cotton soils to be found in eastern North Carolina. With proper crop rotations, including the production of some leguminous crop like cowpeas or peanuts in the rotation, and with the proper incorporation of organic matter in the form of stable manure or of a green crop turned under, the yields of cotton have been materially increased by the best farmers of this region.

Wheat is grown to only a limited extent in eastern Virginia upon the Norfolk fine sandy loam, and the texture of the soil is altogether too light for the production of this crop as a staple.

In North Carolina winter oats may be sown and either grazed off or cut for hay after having performed their function of a winter cover crop to prevent soil erosion and leaching. Very few oats are ever cut and thrashed for the grain, so that the yields may not be stated.

For the improvement of the Norfolk fine sandy loam, crimson clover is being grown to a limited extent. It makes an excellent winter cover crop, and when turned under in the spring the soil produces a much larger yield of corn.

Truck crops.—The Norfolk fine sandy loam is sufficiently warm and well drained to constitute a valuable soil for the production of the late and heavier truck crops, though it is not primarily a trucking soil like the Norfolk sand or Norfolk fine sand. Among these, Irish potatoes are the most important. In eastern Virginia and in North Carolina yields of 90 to 150 bushels of Irish potatoes per acre may be secured with proper fertilization and cultivation. The yields are somewhat larger upon the Norfolk fine sandy loam than upon the lighter members of the series, but the potatoes are not ready for market at such an early date, nor is the quality quite so good as upon the more sandy soils.

Sweet potatoes constitute an important and valuable truck crop, as well as an important general farm crop upon the Norfolk fine sandy loam. The yields are about the same as for Irish potatoes.

In a few localities, particularly in eastern Virginia, cucumbers are also produced as a truck crop to fair advantage.

It is upon the Norfolk fine sandy loam in eastern North Carolina that lettuce has become an extremely important winter forcing crop. The soil is thrown up into beds with heavy applications of well-

rotted stable manure and with the addition of large amounts of complete commercial fertilizer. These beds are so arranged that they may be protected from severe frosts in January and February by cheesecloth coverings, which may be rolled down to cover the beds at night and rolled back in the morning after danger from frost has passed. The lettuce is largely of the head variety and yields valued at $800 to $1,200 an acre have been secured under the best systems of management.

Cantaloupes and watermelons are both produced to fair advantage upon the Norfolk fine sandy loam and constitute important secondary truck crops for shipment to northern markets.

Fruit crops.—Peaches are the most important tree fruit which may be grown upon the Norfolk fine sandy loam. Orchards should be planted only in locations which have excellent air drainage as well as water drainage. The trees are reasonably long lived and thrifty, and if the location is well chosen good crops are secured at from 3 to 4 years from the planting of the orchard.

Strawberries are of secondary importance as a fruit crop, although they are grown to quite an extent upon the Norfolk fine sandy loam. The early varieties for the northern market are best suited to this type.

South Atlantic section.—In the South Atlantic section, including South Carolina, Georgia, and Florida, the soil adaptations vary somewhat from those of the Middle Atlantic section. Among the general farm crops cotton takes the leading place, and yields ranging from one-third bale to 1¼ bales per acre of Upland cotton are secured. Immediately along the coast, particularly upon the sea islands, the Sea-Island or long staple cotton is also produced to good advantage upon the Norfolk fine sandy loam, where the elevation is not too great.

Bright tobacco is grown to a limited extent in some portions of eastern South Carolina, although the cultivation of this crop is being extended. Yields vary from 500 to 1,000 pounds or more per acre, depending upon the degree of fertilization and care bestowed upon the soil.

Corn is an important general farm crop, giving yields of from 12 to 30 bushels per acre, which may be exceeded by more careful methods of fertilization and tillage. The Norfolk fine sandy loam compares favorably with the Orangeburg fine sandy loam as a corn soil in this general region.

Cowpeas are grown as in the Middle Atlantic section with about the same results.

In southern Georgia and northern Florida the medium-deep phase of the Norfolk fine sandy loam is the chosen soil for the production

of shade-grown cigar-wrapper tobacco. On this phase the subsoil at a depth of 10 to 15 inches is normally a heavy fine sandy loam, which quickly passes into a bright-yellow friable fine sandy clay. This type of soil maintains sufficient moisture supply for the development of the shade-grown tobacco without irrigation, and yields varying from 1,000 to 1,300 pounds per acre are secured. Heavy fertilization with organic manures and with special commercial fertilizers are required for securing the larger yields. Careful and frequent cultivation throughout the growing season is required, and in especially dry seasons facilities for irrigation will frequently increase the crop yields sufficiently to warrant the expenditure for the necessary outfit. A good crop of shade-grown tobacco will produce from 50 to 60 per cent of wrapper leaves. Neither the deep nor the shallow phases of the Norfolk fine sandy loam is so well suited to the production of the shade-grown tobacco as this medium phase.

In both the South Atlantic and Eastern Gulf sections the Norfolk fine sandy loam is also an important soil for the production of table sirup from sugar cane. Yields of 200 to 450 gallons of sirup per acre have been secured, and the cultivation of cane for sirup production may well be extended upon this soil type.

Of the secondary crops suited to the Norfolk fine sandy loam, winter oats is the most important. The crop is usually sown after some other crop has been harvested in the fall. Oats produce light yields of forage, which may either be grazed off or cut for hay. Grain is rarely produced.

Truck crops.—Early Irish potatoes are occasionally produced upon this type, but the more sandy members of the Norfolk series are better suited to potato raising for the early market. Sweet potatoes are extensively grown as a home crop, and upon well-prepared areas of the Norfolk fine sandy loam produce yields of 150 to 200 bushels per acre.

Watermelons and cantaloupes are grown for the home market, and, to a limited extent, for shipment.

From southeastern North Carolina to Florida the Norfolk fine sandy loam is probably the best soil for the production of winter cabbages. For this crop the soil must be well supplied with organic matter, the depth to the sandy clay subsoil must not be too great, and drainage must not be excessive. If natural drainage is insufficient, as in the lower lying areas, artificial drainage through open ditches or systems of tile may be required. The crop does not require protection from winter frosts from Wilmington southward, and may be placed upon an early northern market.

Cucumbers and lettuce are also grown to a limited degree.

Fruit.—In South Carolina the Norfolk fine sandy loam has been shown to be well suited to the production of strawberries. The soil for the production of strawberries is heavily fertilized with a complete commercial fertilizer, and the best growers also prepare the land either by raising some leguminous crop for green manure, or by the application of large amounts of stable manure. With this thorough preparation and fertilization the growers not infrequently secure from $300 to $500 per acre net profit.

Peaches may also be grown upon the properly drained areas of the Norfolk fine sandy loam having the requisite elevation and air drainage. The development of peach orchards upon the type is becoming important in southern Georgia and northern Florida. It is usually considered best to locate the orchards upon the shallow or medium phase of the type, although satisfactory growth can be made even if the subsoil is present at a depth greater than 24 inches.

The Eastern Gulf section.—In the Eastern Gulf section the Norfolk fine sandy loam is more extensively used for the production of general farm crops than for the raising of truck. Cotton is the principal crop produced, yielding from one-fourth of a bale to three-fourths of a bale per acre, although it is not so well adapted to cotton as are some of the Houston series or some of the River Flood Plains soils. The variation in yield is principally due to the differences in the preparation and fertilization of the land. Corn is second only to cotton in the extent to which it is grown. The yields are frequently unnecessarily low, ranging from 10 to 20 bushels per acre. Cowpeas are sometimes sown in the corn and sometimes grown as an independent forage crop. The average yield is about 1½ tons of cowpea hay per acre. Oats are grown as a secondary winter cover crop, although grain is rarely harvested.

The production of truck crops has not been extensively developed upon the Norfolk fine sandy loam in the Eastern Gulf section except in the southern portions of Alabama and Mississippi, and here not to the extent that is justified. Sweet potatoes are produced for home use, and some watermelons are grown either for the local market or for shipment.

Pecan orchards make a good growth upon this soil in the near vicinity of the Gulf of Mexico.

Western Gulf section.—In this section the Norfolk fine sandy loam is chiefly used for the production of general farm crops. Cotton leads in acreage and produces from one-fourth to one-half of a bale per acre. Corn produces from 15 to 25 bushels. The yields of both crops can readily be increased by careful preparation of the soil and appropriate fertilization. Cowpeas are grown to some extent with

the corn, while the production of peanuts, largely as a forage crop, is steadily increasing.

Truck crops.—Where the Norfolk fine sandy loam has been used in the Western Gulf section for trucking it has been found to yield from 60 to 100 bushels of Irish potatoes, 200 to 300 bushels of sweet potatoes, and 100 to 150 bushels of tomatoes per acre. Where both air and water drainage are satisfactory peaches may be grown.

SUMMARY.

It would appear from these considerations of the actual uses of the Norfolk fine sandy loam that it is best suited in its most northern locations for the production of corn, bright tobacco, peanuts, and cowpeas as the principal general farm crops, with oats, rye, and crimson clover, or possibly wheat, as a winter cover crop. Among the truck crops in the more northern regions, Irish potatoes, sweet potatoes, cucumbers, and lettuce lead, with cantaloupes and watermelons of secondary importance.

In the more southern regions cotton becomes the principal general crop, followed by corn, cowpeas, and locally by bright tobacco.

Among the special crops the production of the shade-grown Sumatra tobacco in southern Georgia and northern Florida is the most important development.

The truck crops for this more southern section are cabbage, strawberries, lettuce, and cucumbers of first importance, and Irish and sweet potatoes, cantaloupes and watermelons of secondary importance.

Peaches are the principal tree fruit, while pecans form the leading nut crop.

In the Eastern Gulf section cotton is the leading general crop; corn is of secondary importance, and the same is true of cowpeas and winter oats.

Truck crops and fruit crops are grown only to a limited degree, although the extension of the area devoted to such crops might well occur in regions located properly with respect to rapid transportation to markets.

In the Western Gulf section cotton is the leading crop, followed closely by corn, while cowpeas and peanuts are of secondary importance.

Among the trucking crops Irish and sweet potatoes and tomatoes are coming to have a leading place.

Peaches are practically the only fruit crop grown.

The Norfolk fine sandy loam is thus one of the most important general-purpose soil types in the Coastal Plain region. It is friable and easy to till. It is normally well drained or susceptible of easy

drainage. Its generally level topography invites the use of modern power machinery, while its productiveness for both general farm crops and for special crops under suitable climatic conditions is somewhat above the average of the majority of the soils of the region.

Careful tillage, the rotation of crops, and the incorporation of organic matter in the surface soil form the most important points to be considered in its cultivation after the proper crops for each locality have been selected.

Approved.
JAMES WILSON,
Secretary of Agriculture.

APPENDIX.

The following table shows the extent of the Norfolk fine sandy loam in the areas surveyed to this time. In the first column is stated the particular survey in which the soil was encountered; in the second column, its extent in acres; and in the third column, the particular volume of the Field Operations of the Bureau of Soils in which the report upon the area may be found. Those desiring a detailed description of the soil and of the general conditions which surround it in any particular area may consult these volumes in almost any public library.

Areas of Norfolk fine sandy loam encountered in the soil survey.

Survey.	Area of soil.	Year of publication Field Operations.
Alabama:	*Acres.*	
Autauga County	2,240	1908
Baldwin County	286,912	1909
Butler County	25,472	1907
Coffee County	1,152	1909
Dallas County	163,392	1905
Hale County	3,328	1909
Henry County	1,024	1908
Lamar County	10,560	1908
Macon County	21,952	1904
Mobile area	7,168	1903
Montgomery County	39,552	1905
Sumter County	48,128	1904
Florida:		
Escambia County	54,016	1906
Gadsden County	28,096	1903
Jefferson County	65,472	1907
Leon County	67,328	1905
Marianna area	65,280	1909
Georgia:		
Bainbridge area	58,688	1904
Fort Valley area [1]	23,488	1903
Grady County	123,392	1908
Thomas County	110,016	1908
Waycross area	11,328	1906
Louisiana:		
Bienville Parish	152,576	1908
Caddo Parish	114,304	1906
De Soto Parish	244,992	1904
Winn Parish	191,424	1907
Mississippi:		
Biloxi area	171,968	1904
Clay County	25,152	1909
Jasper County	96,192	1907
McNeill area	81,472	1903
Monroe County	16,192	1908
Oktibbeha County	24,832	1907
Scranton area	45,824	1909

Areas of Norfolk fine sandy loam encountered in the soil survey—Continued.

Survey.	Area of soil.	Year of publication Field Operations.
North Carolina:	*Acres.*	
Chowan County	17,024	1906
Craven area	125,440	1903
Duplin County	180,032	1905
Edgecombe County	150,912	1907
New Hanover County	9,216	1906
Pasquotank and Perquimans Counties	43,968	1905
Pitt County	161,920	1909
Raleigh to Newbern area	36,100	1900
Robeson County	105,920	1908
South Carolina:		
Charleston area	47,680	1904
Conway area	67,328	1909
Darlington area [2]	25,600	1902
Lee County	3,584	1907
Orangeburg area	4,480	1904
Sumter County	13,824	1907
Texas:		
Anderson County	224,640	1904
Camp County	61,184	1908
Franklin County	5,312	1908
Henderson area	48,064	1906
Houston County	145,408	1905
Lufkin area	6,016	1903
Morris County	33,920	1909
Nacogdoches area	19,008	1903
Robertson County	27,776	1907
Titus County	61,952	1909
Willis area [3]	107,180	1901
Virginia:		
Chesterfield County	8,832	1906
Hanover County	39,232	1905
Norfolk area	38,144	1903
Yorktown area	144,064	1905

[1] Mapped as Norfolk sandy loam.
[2] Mapped as Ayden fine sandy loam.
[3] Mapped as Willis sand and Norfolk fine sandy loam.