SOIL SURVEY OF WILSON COUNTY, TEXAS.

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DESCRIPTION OF THE AREA.

Wilson County is situated in the south-central part of Texas and is approximately 100 miles from the coast. The ninety-eighth meridian of longitude west passes through the county near the center and the twenty-ninth parallel, north latitude, crosses its southern part.

Wilson County is bounded on the north by Guadalupe County, on the northeast by Gonzales County, on the southeast by Karnes County, on the southwest by Atascosa County, and on the northwest by Bexar County. The county contains 501,312 acres, or about 783 square miles.

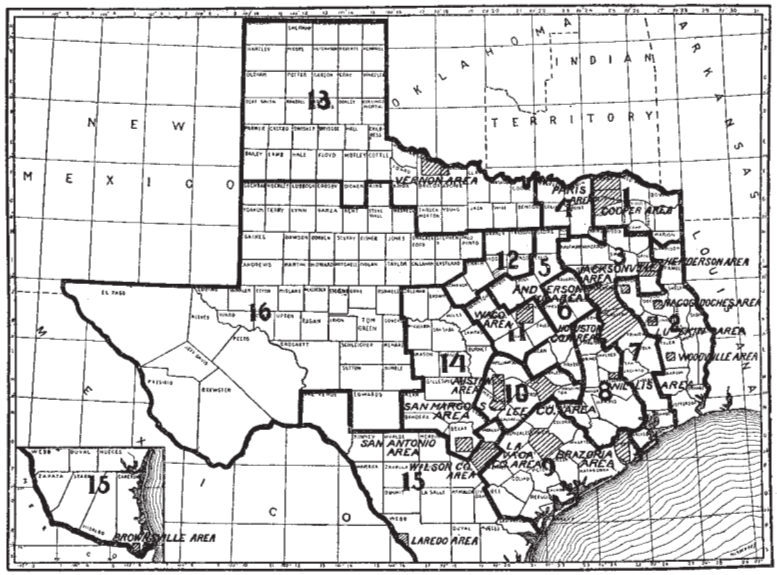

FIG. 20.—Sketch map showing location of the Wilson County area, Texas.

In elevation Wilson County varies from 375 feet to about 575 feet above sea level. It is inclined toward the southeast and has a general slope of about 8 feet to the mile. The topography of the county is for the most part gently rolling. The surface is divided into a series of broad, low parallel divides, between some of which are broad, level bottom lands. The most important of these is found along the San

Antonio River, whose bottoms are about three-quarters of a mile wide. The interdivide areas along the other streams are very narrow. The bluff lines along the bottom lands of the San Antonio and Cibolo rivers, while precipitous in some places, usually have gentle slopes, and the bottom lands are rarely more than 40 feet below the surrounding uplands.

The main drainage of the county is effected through the San Antonio River and its tributaries, all of which flow in a general southeasterly direction. The San Antonio River drains the western part, the Cibolo River, which is the main tributary of the San Antonio River, the central part, and Ecleto Creek the eastern part of the county. The extreme northeastern and extreme southwestern parts of the county are drained by tributaries of the Guadalupe and Atascosa rivers, respectively.

Artesian water is obtainable in some parts of the county. Some wells are located in the extreme southwestern part on the Stevens ranch and others are found near Floresville and Union.

The first permanent settlers in the county were Americans from some of the older Southern States. Since the civil war and up to the time of the ravages of the cotton boll weevil the population grew steadily. Just before the advent of the boll weevil the increase was more rapid than at any other time, but the growth was healthy and not of a character or of such extent as to cause a boom. For a few years the damage to the cotton crop had a depressing effect upon business and there was some emigration from the farms, but within the last year and a half the county has resumed its former activities. Immigration in late years has been chiefly from older parts of Texas, with a few newcomers from the Northern States. Germans, Bohemians, and Poles have gradually settled in different parts of the county, but chiefly in the southern half on the heavier soils. Most of them make thrifty, prosperous citizens.

The present conditions as to settlement vary considerably in different parts of the county. The first soils to be permanently cultivated were the sandy loams and those sections in which these soils are found are the more thickly settled to-day. At the present time the heavier soils are being cleared for cultivation much more rapidly than the other types.

In the more sparsely settled sections of the county stock ranching is still being carried on, though on a much smaller scale than formerly. The largest ranches are located on the heavier soils in the southern, southeastern, and southwestern parts of the county. The deep sandy section between Calaveras and Lavernia is devoted almost entirely to ranching. The principal farming area extends across the center of the county from southwest to northeast,

There are no large towns within the area. Floresville and Stockdale are the most important towns and principal local markets. Floresville, which is situated in the west-central part of the county, is the county seat and largest town, having a population of about 1,200. Stockdale, situated near the east-central part, has a population of about 950. Lavernia, in the northern part of the county, has a population of about 450.

There is practically no manufacturing in any of the towns within the county nor in any of the near-by cities outside the area, and all depend upon the agriculture of the surrounding district for support. At Saspamco there is a tile factory and at Calaveras a company making brick.

Wilson County is well supplied with transportation facilities. No part of the county is more than 13 miles from a railroad. The San Antonio and Aransas Pass Railway and the Galveston, Harrisburg, and San Antonio Railway pass through the western and eastern parts of the county, respectively. Both these systems furnish a ready access to all the markets of the State. San Antonio, the nearest large market, is but 30 miles from Floresville and 38 miles from Stockdale. Direct connections are also made over both railways with Gulf ports.

CLIMATE.

The climate of Wilson County is mild and healthful. There is neither extreme heat nor extreme cold. The latitude of the county would suggest much higher temperatures than exist, but excessive heat is prevented by the prevailing winds from the Gulf, which are nearly always to be felt. Occasional hot days are generally followed by cool, restful nights. During the winter months some rather sudden changes in temperature occur, when cold waves from the north, known as "northers," reach down into this section. But such periods of cold are of short duration, lasting rarely more than three days. The accompanying table shows the mean annual temperature to be about 69° F. The greatest extremes of heat and cold recorded at San Antonio, which is but 30 miles northwest of the center of the county, is 106° F., recorded in July, 1894, and 4° F., recorded in February, 1899. The average number of days in the year with maximum temperature above 90° is 94, and the average number of days with minimum below 32° is 12. The average depth of snow, also recorded at San Antonio, is 0.3 inch.

The annual rainfall of Wilson County is about 32 inches. This amount of rainfall is usually ample for farm crops, although occasionally dry years occur. The least precipitation recorded at San Antonio in any one year is 15.9 inches and the greatest 40.5 inches.

The following table, compiled from the records of the Weather Bureau, gives the mean annual and monthly temperature and precipitation at San Antonio and Runge, points about equal distances northwest and southeast of the county, respectively.

Normal monthly and annual temperature and precipitation.

Month.	San Antonio.		Runge.		Month.	San Antonio.		Runge.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	In.	°F.	In.		°F.	In.	°F.	In.
January	51.5	1.70	55.3	1.40	August	82.2	3.84	85.8	1.39
February	55.8	1.96	54.3	2.20	September	77.5	3.41	80.2	3.68
March	61.9	2.05	.....	.....	October	69.7	1.67	73.1	2.45
April	70.1	2.98	70.4	.....	November	59.0	2.07	63.1	1.67
May	74.9	3.23	77.0	3.98	December	54.9	1.91	55.0	1.96
June	80.7	2.67	83.8	2.80					
July	83.3	4.79	85.2	2.41	Year	68.5	32.28	.....	.....

The following table, compiled from the same source, gives the dates of the last killing frost in the spring and the first in the fall for seven consecutive years. From this table it will be seen that the shortest growing season for tender vegetation, 213 days, occurred in 1900, and the longest, 311 days, in 1898, the average being about 275 days, or about nine months.

Dates of first and last killing frosts.

Year.	San Antonio.		Runge.		Year.	San Antonio.		Runge.	
	Last in spring.	First in fall.	Last in spring.	First in fall.		Last in spring.	First in fall.	Last in spring.	First in fall.
1898	Jan. 16	Nov. 22	None.	Nov. 22	1902	Feb. 16	Dec. 16	Feb. 16	Dec. 3
1899	Mar. 6	Dec. 4	Feb. 16	Dec. 4	1903	Feb. 18	Nov. 18	Feb. 16	Nov. 18
1900	Apr. 12	Nov. 12	Mar. 1	Nov. 13	1904	Feb. 12	Nov. 12	Feb. 21	Nov. 12
1901	Mar. 6	Dec. 10	Mar. 6	Dec. 14	Average	Feb. 24	Nov. 26	Feb. 22	Nov. 25

AGRICULTURE.

When settlers first came to this part of Texas most of the land was open prairie. This they first devoted largely to cattle raising, other forms of agricultural pursuit receiving little or no attention. Practically no cotton was produced and very little corn was grown. The prairies were covered with tall grass and furnished feed for the cattle the year round. These conditions continued until some time after the civil war. Gradually the mesquite, which had been kept down by the practice of burning the grass in the fall and spring, began to gain ascendancy over the cattle ranges, and the once rich pastures began to wane. The number of cattle that could subsist in the open prairie land was greatly reduced, and, moreover, the county

had been gradually settled and put under cultivation, which also curtailed the extent of range, compelling the cattlemen to leave the county in quest of new grazing lands. This transition of the agricultural interests of Wilson County from cattle raising to general farming has been in gradual progress for the last twenty years.

The principal crops now grown, as has been the case from the beginning of agriculture in this region, are cotton and corn, though the cotton alone is marketed. Prior to the advent of the boll weevil cotton and corn were grown practically to the exclusion of all other crops. Since the appearance of this pest, however, other crops, such as peanuts, peas, sweet potatoes, sorghum, Johnson grass (for hay), some fruits, such as peaches and pears, and some vegetables have also been produced to a small extent. The growing of peanuts in connection with hog raising is becoming a profitable source of revenue.

Being a comparatively new section, where land is cheap and easily obtainable, but little attention has been paid to agricultural methods tending to conserve soil resources. The methods generally employed are superficial in character. They have doubtless up to this time satisfied the economic conditions, but the time is near at hand, if not already here, when it will pay to give more particular attention to the preparation of the seed bed, to subsequent cultivation, and to such practices as will result in the conservation of the greatest proportion of the soil moisture.

In this view the general type of agriculture in the county is capable of much higher development. While cotton and corn have been grown consecutively for a few years on some areas, most of them have as yet declined but little, if any, in productiveness. Probably not more than one-fifth of the total acreage of the county has as yet been cultivated. Fertilizers of any kind have been used only within the last two years, during which time a little commercial fertilizer has been applied to cotton in some fields.

The farmers of the county are prosperous. Those on the heavier soils have perhaps acquired more wealth, as is evident from the general appearance of the farms and buildings, but throughout the county all have both the necessities and comforts of life. In general, the heavier soils of the area are preferred as being the more productive. However, considerable depends on the character of the season and the methods of cultivation employed. During a droughty season, with the methods now in general use, somewhat larger yields are obtained from the sandy loam soils, while during other years the heavier soils lead.

For the production of cotton, corn, forage crops, and in general farming the Wilson clay loam and Wabash clay are the strongest soils in the area. Peaches, melons, potatoes, and peanuts do best on the sandy loam soils. Peanuts and peas could undoubtedly be grown

with profit on all the soil types in the area. The farmers in general have so far paid very little attention to the adaptation of soils to special crops, and the tendency is to grow all the cotton possible, regardless of the type used. It follows that rotation of crops is a question yet to be worked out. When cotton and corn are both grown they are usually alternated, but often cotton is planted on the same ground for a number of years.

Part of the land is plowed broadcast and part in ridges. In planting cotton many simply throw two furrows together on unbroken land, thus forming a ridge under which lies a strip of unbroken soil and on this ridge over the strip of hard soil the cotton is planted. For corn the land is more often plowed level. The plowing is always shallower than it should be to give the best results, regardless of the texture of the soil. Subsequent cultivation is from 3 to 4 inches deep and the ridge method is universally used. The plowing is usually done in the spring just before planting the crop.

The labor employed in the area consists of both white and colored. The first class is the most numerous and consists of German immigrants, who usually work by the month until they get a start and then buy property of their own, and of many Mexicans. The latter outnumber the negroes and are considered fairly efficient. The foreign element in the farming class does not hire much help, men, women, and children all working in the fields in the settlements made up of immigrants from other countries and their descendants.

There is a wide range in the size of farms in the county, and the size varies greatly on the different soil types. The Orangeburg fine sandy loam is divided into rather small farms, while the heavier soils and the deep sandy soils show much larger holdings. Some farms on the heavier soils consist of tracts of several thousand acres. The greater number of farms, however, taking the county as a whole, range in size from 100 to 640 acres.

A large majority of the farms are worked by the owners. Some of the farmers owning large tracts rent a part of their lands, and in this case it is the usual practice to take rent in the shape of a share of the produce, the landowner commonly receiving one-third of the corn and one-fourth of the cotton. Cash rent ranges from $3 to $4 an acre.

The value of farm lands is fairly uniform in different parts of the county. The variations occurring are due chiefly to location and type of soil and prices paid range from $3 to $35 an acre. In general the heavier soils are considered the most valuable farm lands in the county, and the Wilson clay loam and the Wabash clay are valued at from $15 to $35 an acre. Unimproved farms of these types of soil sell at from $15 to $20 an acre. The Norfolk fine sand is the

cheapest soil in the county, being sold for from $3 to $10 an acre. The sandy loam soils are valued at from $10 to $30, according to the improvements and location. There is thus a fine opportunity to secure paying farm lands in the county, even where only a limited capital is available.

Throughout the area there should be a greater diversification of crops grown. Not only is there a loss in the productivity of the soils where one crop is grown continuously, but farmers should guard against failures caused by unfavorable seasons, the ravages of insects or diseases, and by depressions in prices, all of which factors are likely to be more critical to a man who depends solely upon one line of endeavor.

There should be more attention paid to the rotation of crops. While all of the soils of the area would be benefited, the sandy soils are particularly in need of large quantities of organic matter for the best yields of crops. It is recommended that a rotation, including leguminous crops, such as peanuts and cowpeas, be followed where staple crops are grown. In cases where cotton rot is troublesome a rotation of corn, sorghum, and cotton has been found very beneficial.

The ridge method of plowing and subsequent cultivation should be dispensed with on all soils, except where level cultivation would not insure proper drainage. The depth of plowing should vary with the kind of soil. The sandy soils should be plowed shallow, while the heavier soils require to be broken more deeply, and on both plowing should be followed by shallow cultivation of crops. Plowing should also be done in the fall. The object in all cases should be to conserve soil moisture for the future use of crops. After each rain a shallow cultivation should be given whenever practical so as to form a mulch or "dust blanket," which, destroying capillary connection with the deeper soil, prevents the loss of soil moisture by evaporation.

SOILS.

Wilson County lies wholly within the Gulf Coastal Plain and its soils are very largely the weathered products of marine deposits of Eocene Tertiary time.

Extending across the northern half of the county from northeast to southwest are found a class of soils having compact clay subsoils carrying small quantities of fine sand and varying in color according to the amount of iron present, to the conditions of drainage, and to the degree of oxidation and aeration. Overlying these clays, to depths varying from 4 to 36 inches, is a veneering of sandy material varying in texture from a light sandy loam to a loose sand, the sand being of a fine grade. The soils found in this physiographic division belong to what are known as the Orangeburg and Webb series. In

areas mapped as Webb loam no sandy material overlies the clay, which has been exposed to direct surface weathering and has been modified to some extent by wind-blown material.

Running northeast and southwest across the sandy section of the county and near the northern edge is a broken belt of light-gray loose and incoherent medium to fine sand 3 feet or more in depth, which, in all probability, represents an ancient sea beach. This belt, which is, as a rule, quite broad, gives rise to a soil called Norfolk fine sand. Lying to the south of the sandy section of the county is a later geological formation, consisting of calcareous clays, also a marine deposit of Eocene Tertiary time. The Wilson clay loam is derived from this formation. The Wilson loam occurs between these calcareous clays and the sandy section first described and is formed by the intermingling of these two diverse classes of material.

The Bastrop fine sandy loam occurs as a level terrace lying about 20 feet above the bottom lands. Its origin probably dates back toward the Tertiary period. It was at one time in all probability subject to overflow. The higher ridges along the bluff lines bordering the river bottom are occupied by the hilly Susquehanna gravel. The derivation of the gravel content of this soil is probably from an older gravel deposit, while the sand which is found on the surface and mixed in with the gravel is from the same source as the sandy material forming the surface soil of the sandy upland types.

Along the streams are found areas of alluvial soil, but with the exception of Meadow they are seldom if ever overflowed. The texture of these bottom land soils varies with the character of the soils and the geological formations of the localities through which the streams flow. The Wabash clay is composed largely of material brought down from the black prairie region to the northward. The Austin fine sandy loam consists of coarser material deposited during Tertiary time along the immediate banks of the San Antonio River and to some extent along the Cibolo River. It has in all probability been brought down from the less humid region still farther northwest than the material of which the Wabash clay is composed. In the case of the soil called Meadow the material is a wash from the surrounding light sandy upland soils.

The following table gives the area of each type of soil found in Wilson County. The location and distribution of the several types is shown by color on the accompanying soil map.

Areas of different soils.

Soils.	Acres.	Per cent.	Soils.	Acres.	Per cent.
Wilson loam	97,216	19.4	Webb loam	17,088	3.4
Webb fine sandy loam	89,280	17.8	Austin fine sandy loam	11,136	2.3
Orangeburg fine sandy loam	77,056	15.4	Bastrop fine sandy loam	5,824	1.2
Norfolk fine sand	68,032	13.6	Meadow	4,544	.9
Wilson clay loam	52,416	10.2	Susquehanna gravel	1,152	.2
Orangeburg fine sand	49,408	9.9			
Wabash clay	28,160	5.7	Total	501,312	

WILSON CLAY LOAM.

The soil of the Wilson clay loam is a clay loam or clay, dark brown or black in color, and sometimes streaked with a yellowish tinge. It is quite sticky when wet, but friable and loamy when dry and in a well cultivated condition. Its physical properties give it great water-holding capacity, a valuable feature in this region. In its virgin state the surface becomes hard, baked, and sun-cracked. The soil at about 10 inches grades into a dark-brown or black clay, which becomes heavier in texture and lighter in color as depth increases. At 36 inches it is a stiff, compact clay often tinged with yellow. With the exception of one or two areas in the southwestern part of the survey, which are somewhat heavier in texture, darker in color, and more inclined to sun-crack; the type is very uniform in texture.

The Wilson clay loam occurs in bodies of greater or less extent in that half of the county bordering Karnes County. The largest areas are found in the southern part of the county west of the San Antonio River and in the eastern part south and east of Pandora. The topography is gently rolling. The slopes are long and gradual, with wide, shallow valleys between them. The surface affords good natural drainage and only a few areas need to be drained artificially.

The Wilson clay loam is derived from the weathering of Coastal Plain deposits consisting of calcareous clays of Eocene Tertiary age, which give rise to this fertile soil over a wide belt in Texas.

This type of soil, when found near the railroads, is largely under cultivation, but in the more remote sections is used almost entirely for pasture. It is the strongest upland soil in the area for staple crops. Cotton averages from five-eighths to three-fourths of a bale per acre, and when especially well cultivated in favorable seasons much larger yields are obtained. Corn produces on the average from 30 to 40 bushels per acre, but varies with the seasons, much larger yields being obtained during a wet season. Sorghum cane, while not extensively grown, yields from 2 to 3 tons per acre, from the 1 to 3 cuttings which are made each year. When properly culti-

vated this soil has strong drought-resisting qualities, and much of the fluctuation in yield now experienced by the farmers can be obviated by putting into practice a system of culture designed to conserve the soil moisture.

The following table gives the average results of mechanical analyses of samples of the soil and subsoil of the Wilson clay loam:

Mechanical analyses of Wilson clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16407, 16409.....	Soil.....	0.1	0.9	1.5	12.6	16.6	49.2	18.6
16408, 16410.....	Subsoil.....	.1	.5	1.6	9.6	10.4	44.4	33.0

WILSON LOAM.

The surface soil of the Wilson loam consists of 10 inches of dark-gray or sometimes a dark brownish-gray loam, containing a considerable quantity of sand, which renders the surface friable and easily worked. A few small, rounded pebbles are occasionally found on the surface and in the soil and subsoil. The subsoil is a drab silty clay or heavy loam, containing a very small quantity of fine sand. It becomes lighter in color and heavier in texture as the depth increases and at 40 inches is a stiff, tenacious, silty clay, the color of which is often tinged with yellow.

The type occurs in irregular-shaped bodies scattered promiscuously over the western, southern, and eastern parts of the survey. As a rule these bodies occur in long, rather narrow areas, running in a general northeast and southwest direction.

Areas embraced by this type occur between the heavy black prairie clay soils and the sandy soils, the type being formed by the intermingling of these two classes of material. Its origin is indicated by the fact that bordering the sandy soils the type contains more sand, while near the black prairie clay soils it is heavier. A considerable quantity of the sand in the more sandy areas is wind-blown material from the adjacent areas of the sandy types. However, the greater part of the type represented is the mean result of the intermingling of the two materials.

The topography of the Wilson loam is slightly rolling. The surface is sloping enough to afford good natural drainage. Along a few of the larger stream courses there is a tendency to wash, but erosion has seldom taken place to such an extent as to interfere with the use of modern machinery.

This type is not as extensively cultivated as the Wilson clay loam, and up to the present time not many areas have been cleared of the

rather heavy mesquite growth. The areas are used very largely for pasture. The few fields under cultivation are devoted solely to the production of the staple crops. The Wilson loam is best adapted to early maturing crops because of its droughty nature. Although this soil has great water-holding capacity its texture allows capillarity to work freely and rapidly, and unless methods of cultivation are used to conserve moisture, crops quickly suffer during dry spells. Crops are often affected on this type, while on others from which evaporation takes place more slowly they do not suffer. With the methods now in general use and in ordinary seasons, cotton yields from one-half to five-eighths bale per acre and corn 25 to 30 bushels. Sorghum cane is grown with good results.

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

Mechanical analyses of Wilson loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16403, 16405.....	Soil.....	0.2	0.4	1.4	26.1	33.1	24.0	14.0
16404, 16406.....	Subsoil.....	1.2	1.1	1.0	19.9	32.1	25.4	18.8

The following sample contained more than one-half of 1 per cent of calcium carbonate ($CaCO_3$): No. 16406, 0.7 per cent.

NORFOLK FINE SAND.

The Norfolk fine sand consists of a very light gray, loose and incoherent fine to medium sand, more than 3 feet in depth. There is little or no difference between soil and subsoil except that the surface 2 or 3 inches is usually slightly darker in color, owing to the accumulation of a small amount of organic matter. Occasionally at 40 inches is found a red and light-gray mottled sandy clay. In one or two of the more level areas, where the clay seldom comes within 40 inches of the surface, there is no mottling in the underlying stratum, which is of a solid light-gray color.

This soil is found in rather large bodies extending across the northern part of the county in a general northwest and southeast direction. The topography is, for the most part, gently rolling, but occasional areas occur which are found to be rather level while others are more rolling. The depth of the sand and its topography insure perfect drainage.

The Norfolk fine sand is an Eocene Tertiary deposit and represents, in all probability, an ancient sea beach now more or less weathered. Broken remnants of this ancient sea beach are found extending parallel with the coast for a considerable distance across the State.

This soil type is generally regarded as of little agricultural value and is used almost entirely for pasture. Only now and then are small cultivated fields to be found, and they are situated chiefly near the line of contact with adjoining soils. Cotton, peanuts, and sweet potatoes are about the only crops grown. A very small acreage is given to corn, but it does not produce remunerative yields. The yield of cotton is also small, averaging from one-fourth to one-third bale per acre. Peanuts do well and if grown in connection with hog raising would undoubtedly prove profitable. Peaches if properly cultivated would do well, and excellent yields of melons and grapes could undoubtedly be produced. While held in low esteem under present conditions in Wilson County, this is a valuable type of soil for certain special industries, such as trucking and small fruit growing.

The Norfolk fine said is not as droughty a soil as might be supposed, for the fine sand of which it is composed allows fair movement of capillary moisture and the surface soil when dry acts as a natural mulch, thus reducing evaporation to a minimum. The deficiency in organic matter in the soil could be overcome by green manuring, and such treatment would also increase the water-holding power of the type.

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

Mechanical analyses of Norfolk fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16411	Soil	0.3	8.8	11.1	59.9	10.4	8.6	0.5
16412	Subsoil	.3	9.0	11.6	58.2	12.2	8.2	.9

ORANGEBURG FINE SAND.

The soil of the Orangeburg fine sand is a reddish-gray sand, ranging in depth from 15 to 36 inches, and having an average depth of about 2 feet. The subsoil is a red or mottled red and light-gray and occasionally a light-drab clay, always containing a considerable proportion of fine sand.

This type is found scattered throughout the northern sandy section of the county. It occurs as a gradation soil between the Norfolk fine sand and the Orangeburg fine sandy loam or, in a few instances, between the Norfolk fine sand and the Webb fine sandy loam. The topography of the areas is uniformly gently rolling or undulating, and they are naturally well drained.

The material from which the Orangeburg fine sand is derived is Eocene Tertiary in age. The greater depth of sand in local areas has undoubtedly been brought about by wind action, but how great

a part this has played in the formation of the soil as a whole can not be stated. It is probable that much fine material, such as found in the subsoil, has been removed from the surface material in the drainage waters, so that the present condition of the surface has in part resulted from the sorting action of water.

The crops now grown on this soil are cotton, some peanuts, sweet potatoes, and a very little corn, the latter being an uncertain crop. Cotton produces on the average from three-eighths to one-half bale per acre. This soil is well adapted to melons, peaches, sweet potatoes, grapes, and peanuts. The type is deficient in organic matter, and systematic green manuring, together with the introduction of leguminous crops, such as peanuts and peas, into the rotation, is recommended.

The following table shows the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Orangeburg fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16413, 16415.....	Soil.....	0.1	6.6	7.1	54.2	19.3	8.3	5.1
16414, 16416.....	Subsoil.....	.1	8.2	9.6	25.0	7.6	18.7	30.4

ORANGEBURG FINE SANDY LOAM.

The Orangeburg fine sandy loam is locally known as "post oak land." The soil is a fine, loamy sand, reddish brown or gray in color and variable in depth, ranging from 6 to 15 inches, with an average of about 13 inches. Road cuts and borings in fields show the depth of the soil to be very irregular, the clay subsoil coming close to the surface, then dropping rather abruptly to 15 inches, only to come close to the surface again, all within an area of a few square feet. The subsoil varies from a red to a reddish-brown or yellowish-red clay, containing a relatively small quantity of fine sand. Iron concretions are found in both soil and subsoil.

The greater part of the Orangeburg fine sandy loam is found in the central and northeastern parts of the county. Other small areas occur near Lavernia, in the northern part, and near Fair View, in the northwestern part. The surface is for the most part rolling. Some areas near the heavier soils are more level, while other scattered bodies may be more broken than the greater proportion of the type. The hills are low and rounded and the valleys between them rather narrow as compared with those in other parts of the county. With the exception of a few small stony areas on the crests of hills and erosions along some of the streams, which are frequently deeply gullied, the type is all arable land.

The topography of this soil, together with the many stream courses that intersect this section, afford good surface drainage. The subdrainage, however, is not as good as that of the surface and during a very wet year there is a tendency for the soil to "run together," a condition caused by the close impervious subsoil which does not absorb moisture readily, but holds it in the fine sandy soil above, where its movement upward and laterally is slow. This keeps the soil in a wet, soggy condition, unfavorable to the healthy growth of crops.

The Orangeburg fine sandy loam is derived from Eocene Tertiary deposits. Small spots, in which the soil is more than 15 inches deep, occur promiscuously scattered within this soil type and when large enough to be mapped on the scale used were classed as Orangeburg fine sand.

The Orangeburg fine sandy loam is one of the most extensively cultivated soils in the county. The early settlers preferred this soil because it was thought to be more resistant to drought and to produce larger yields one year taken with another. The general opinion has since changed and the heavier soils are now usually preferred. However, during a dry year and with the methods now in general use larger yields of the staple crops are secured from this type than from the heavier ones.

The Orangeburg fine sandy loam in ordinary seasons is not as well adapted to the staple crops as the heavier soils. It is, however, adapted to a greater variety of crops, and fair yields of the staple crops are secured. It is an excellent peach and a good truck soil, and would in all probability produce a good quality of cigar tobacco. Melons, plums, pears, Irish and sweet potatoes, beans, peas, and peanuts do well on this soil. Cotton yields on the average about one-half bale per acre and corn from 20 to 25 bushels.

The following table shows the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Orangeburg fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16419, 16421.....	Soil.....	0.2	0.3	0.5	26.1	53.9	15.1	4.0
16420, 16422.....	Subsoil.....	.2	.2	.4	20.9	27.2	19.9	31.4

WEBB FINE SANDY LOAM.

The Webb fine sandy loam is locally known as " red sandy mesquite land." While in some respects this soil is quite closely related to the Orangeburg fine sandy loam, in others it is quite distinct. The main

differences between the two types are found in timber growth, topography, productiveness, and depth of soil. The soil of the Webb fine sandy loam is also more loamy, and both soil and subsoil have a somewhat darker color.

The surface soil of the Webb fine sandy loam is quite uniform as to depth, averaging not more than 10 inches. It is a dark-brown or reddish-brown light sandy loam or a heavy loamy sand. The subsoil is a dark-brown, reddish, or yellowish-brown clay, mottled, especially in the lower depths, and containing a perceptible quantity of fine sand. In both soil and subsoil are found small quantities of iron concretions and also occasionally a few small rounded pebbles.

A large part of this type of soil occurs in the northern half of the county, west of the San Antonio River. Other quite extensive areas are located in the vicinity of Kosciusko, Poth, and west of Dewees, near the Atascosa County line.

The type occupies undulating or gently rolling areas and has good surface drainage. The crops, however, suffer from poor subdrainage to about the same degree that they do on the Orangeburg fine sandy loam. The Webb fine sandy loam is rather easily eroded, but is seldom affected to such an extent as seriously to interfere with cultivation.

The fine sands and clays from which this soil is derived are the remains of a deposit laid down in the Eocene Tertiary period.

The Webb fine sandy loam is one of the strongest sandy soils in the area. Cotton, corn, Irish and sweet potatoes, peanuts, sorghum, peas, melons, and some other garden vegetables are grown on this type. The yields vary to some extent with the season, as on the Orangeburg fine sandy loam, though to a less extent. Cotton will yield from one-half to five-eighths bale and corn about 25 bushels per acre. Excellent yields of melons, peanuts, peas, and vegetables are obtained, but crops requiring heavy or rich organic soils, as for instance, cabbage, and onions, are not recommended. There are a few small orchards, which are in a flourishing condition. Peaches do very well, and pears, where not affected by blight, are grown with good success.

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

Mechanical analyses of Webb fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16417	Soil	0.0	0.5	0.3	53.9	19.8	20.5	5.0
16418	Subsoil	.1	.3	.4	24.6	15.7	29.1	29.9

WEBB LOAM.

The surface soil of the Webb loam consists of about 10 inches of rather heavy reddish-brown loam. The subsoil is reddish-brown or brown clay loam, grading at about 24 inches into a stiff, compact, red or yellowish-red clay. In both soil and subsoil are found a few iron concretions and occasionally a few rounded pebbles.

The derivation of this soil is from material of Eocene Tertiary time. Areas bordering the sandy soils are usually somewhat more sandy than in typical developments. A considerable part of the sand content in such areas is wind-blown material from the adjoining sandy areas. However, the greater part of the type has not been influenced in this way.

The Webb loam is one of the less extensive soils in the area. It occurs in small, irregular-shaped bodies within areas of Webb fine sandy loam or between the latter type and areas of Wilson loam. The soil has a gently undulating surface and is well drained.

But a few small areas of this soil have been cleared of the rather heavy growth of mesquite and placed under cultivation. Cotton, corn, and sorghum are the only crops grown, and yields are about equal to those of the other heavy soils of the county. Cotton yields on the average between one-half and five-eighths bale per acre and corn from 25 to 30 bushels. This type is a strong soil, adapted to the staple crops and to general farming.

The following table shows the results of mechanical analyses of the soil and subsoil of the Webb loam.

Mechanical analyses of Webb loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16423	Soil	0.5	1.8	1.7	13.8	34.2	24.1	23.7
16424	Subsoil	1.4	2.3	1.3	9.7	24.2	27.3	32.9

AUSTIN FINE SANDY LOAM.

The soil of the Austin fine sandy loam is a yellowish-gray or gray heavy fine sandy loam containing a considerable amount of silt. There is no marked difference between soil and subsoil and, as seen along the river banks, the same material extends to a depth of 10 or 12 feet without change. At this lower depth the subsoil suddenly becomes a very dark-gray or drab heavy silty clay. From the surface to a depth of 3 feet the soil gradually becomes lighter in color. Throughout the material occur many shells, and this has given rise to the local name "shelly land."

The Austin fine sandy loam is found skirting the San Antonio River and to some extent the Cibolo River. The areas are usually narrow, seldom extending back more than one-fourth of a mile from the streams. The soil is derived from material brought down by the streams during floods at a time when the stream beds were at a higher level than now. The topography is flat, but the surface is elevated from 20 to 30 feet above the present level of the streams. Occasional deep arroyos have been cut through the areas by intermittent streams. The type is well drained and, with the exception of a few low spots, is seldom if ever overflowed.

Attempts to irrigate the Austin fine sandy loam have not been successful, for the reason that the texture of the soil is such that water flows but a short distance before percolating into the soil. Corn and cotton are the crops usually grown. Cotton produces from one-half to five-eighths bale and corn about 25 bushels per acre. It is quite probable that certain truck crops, for instance tomatoes, cucumbers, cabbage, and cauliflower, could be successfully grown. Irish potatoes would also do well.

Care must be taken to keep this soil well mulched, for its fine texture and tilth allow rapid loss of moisture by evaporation, and a few days of neglect during hot, windy weather may so reduce the water supply as to injure growing crops.

The results of mechanical analyses of samples of the soil and subsoil of the Austin fine sandy loam are given in the following table:

Mechanical analyses of Austin fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16401	Soil	0.3	0.3	1.7	55.6	17.7	15.0	8.8
16402	Subsoil	.0	.3	1.3	33.2	24.2	27.1	13.6

The following samples contained more than one-half of 1 per cent of calcium carbonate ($CaCO_3$) : No. 16401, 30.2 per cent; No. 16402, 41.7 per cent.

WABASH CLAY.

The Wabash clay consists of a very dark-gray or black clay or clay loam 10 inches deep, grading into a stiff, tenacious clay subsoil, slightly lighter in color than the soil and becoming heavier in texture and still lighter in color as the depth increases. This soil is very stiff and tenacious when wet and on drying it bakes very hard and cracks. Many of the cracks are 3 or 4 inches wide and 2 feet or more deep. A few small areas occur which are slightly lighter in texture and color than the typical soil. This condition is due to the admixture of sandy material brought down from the adjacent uplands. A few such sandy areas are found along the San Antonio River near Floresville and also scattered along the Cibolo River, but

they are so intermingled with areas of the typical soil as to make it impracticable to attempt their separation as a distinct type.

The Wabash clay occurs farther back from the rivers than the Austin fine sandy loam, which occupies their immediate banks. The areas vary from one-fourth mile to 1 mile in width, the extent being greater at the junction of the subsidiary streams with the San Antonio and Cibolo rivers.

The surface of the Wabash clay is practically level. It shows one peculiar feature known as "hog wallows." These "hog wallows," which are depressions from 6 to 12 inches deep and 3 or 4 feet broad, are scattered irregularly through the areas. The surface is also made uneven by the courses of intermittent streams from the adjacent highlands, which have often eroded deep channels through this type. The areas lie at practically the same height above the streams as the Austin fine sandy loam. Except for a few small, shallow, basinlike depressions, which could easily be drained by means of open ditches, the bodies of this type of soil are adequately drained, while owing to their elevation above the streams they are seldom if ever overflowed.

The Wabash clay is of sedimentary origin, being composed of the finer particles of soil carried in suspension by the streams in times of overflow and deposited when their beds stood at a higher level than at present.

This is one of the strongest and most productive soils in the Wilson County area. It is an excellent cotton soil, and corn, sorghum, and millet do well. In an average season cotton yields from five-eighths to three-fourths bale and corn from 30 to 40 bushels per acre. Excellent yields of forage crops are produced. In a few instances small areas of onions have been grown under irrigation on this type, and it is possible that onion growing on a large scale could be made a paying industry here.

The Wabash clay is often desired because of its location near the river, where water for stock is easily obtainable. The cost of clearing the land for cultivation is usually somewhat greater than in the case of the other types in the area, because of the heavy growth of mesquite and chaparral. Some scattered liveoak and willow are also found on the type.

The following table shows the result of the mechanical analyses of a sample of soil and subsoil of this type.

Mechanical analyses of Wabash clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16425	Soil	0.5	1.3	3.2	22.5	14.4	23.9	33.8
16426	Subsoil	.3	.7	.7	3.6	5.1	44.9	45.5

BASTROP FINE SANDY LOAM.

The Bastrop fine sandy loam is a chocolate or dark-brown fine to medium heavy sandy loam, 18 inches deep, underlain by a dark-brown sandy clay subsoil, becoming lighter in color and less sandy as depth increases and at 30 inches changing to a stiff red or yellowish-red sandy clay.

The Bastrop fine sandy loam occurs as level terraces bordering the river bottom lands and lies about 20 feet above the areas of the Wabash clay. The type is of sedimentary origin and its formation probably reaches back to Eocene Tertiary time. The areas were seemingly at one time a part of the river flood plain.

This soil has a moderate organic matter content and great water-holding capacity. The loamy soil allows a ready absorption of the rain waters and the stiff compact subsoil tends to hold the moisture within the reach of crops. While the surface is level the areas are adequately drained.

The Bastrop fine sandy loam is not an extensive soil, embracing an area of but a few square miles. It is found in relatively small scattered areas—the largest contains about 3 square miles—bordering the bottom lands of the San Antonio and Cibolo rivers.

Very good yields of cotton and corn are secured from this soil, cotton producing from five-eighths to three-fourths bale and corn from 35 to 40 bushels per acre. Good yields of sorghum and excellent yields of Irish potatoes and peanuts are produced. It is probable that certain varieties of peas would do well.

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

Mechanical analyses of Bastrop fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16429	Soil	0.0	1.5	6.1	45.7	21.5	13.0	12.0
16430	Subsoil	.0	1.5	4.6	37.0	16.9	22.5	17.7

MEADOW.

The Meadow of Wilson County consists of narrow strips of bottom-land along the smaller streams. Such areas have a wide variation both in texture and in depth of soil and subsoil. Sometimes they consist of fine loamy sand over 3 feet deep, and again of more clayey material. As a whole, however, the soil is light in texture, and usually consists of from 12 to 26 inches of a gray to dark-brown fine loamy sand. The subsoil is a dark-gray fine loamy sand of about the same texture as the soil. The proportion of the finer grades of

material varies considerably and in the deeper subsoil—26 to 40 inches—is sometimes high enough to give a sandy clay texture.

The soil is of recent alluvial origin, being derived from material washed down from the surrounding light fine sandy upland soils. The Meadow is subject to overflow, but both the surface drainage and underdrainage are good and crops seldom suffer from excess of moisture. The principal areas of this type are found along Ecleto, Saibajet, and Marcelinas creeks. The type is under cultivation only in a few very small areas, in which good yields of cotton and corn are produced. It is believed that the Meadow is well adapted to the growing of cucumbers, melons, tomatoes, and other garden vegetables.

SUSQUEHANNA GRAVEL.

The soil of the Susquehanna gravel is a fine to medium light reddish-gray sand, containing from 30 to 75 per cent of rounded gravel and small cobbles scattered on the surface and through the soil itself. The surface 2 or 3 inches is often slightly darker in color than the material beneath, owing to the accumulation of a small quantity of organic matter. At a depth varying from 18 to 36 inches, the subsoil grades abruptly into a red and gray mottled or sometimes yellowish-red or light-drab sandy clay, which becomes heavier in texture and less sandy as depth increases.

The Susquehanna gravel has a very limited extent, covering an area of about 2 square miles in all. It is found most typically developed in the northern part of the county near Lavernia, where it skirts the river bluffs bordering the bottom lands.

The Susquehanna gravel is probably the result of the intermingling of the materials of two different sedimentations. The interstitial fine earth is the same as the material forming the sandy soils of the county, while the gravel and cobbles come from a later coarser deposit.

The Susquehanna gravel is hilly in character and covered with a growth of hardwood, mostly black-jack oak and post oak. The drainage, because of the topography and the open gravelly texture of the material, is excessive. The soil is not adapted to the general crops grown in the area, owing to its droughty nature, and, moreover, practically all of the area is too gravelly to be readily cultivated.

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

Mechanical analyses of Susquehanna gravel.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
16427	Soil	1.3	11.7	39.4	35.0	7.4	3.1	2.7
16428	Subsoil	.1	3.7	37.2	28.1	1.5	2.4	26.5

SUMMARY.

Wilson County, Tex., is situated approximately 100 miles from the Gulf of Mexico, in the south-central part of the State. The surface, which varies in elevation from about 575 feet to 375 feet above sea level, is generally rolling. The regional drainage is good and is effected almost entirely through the San Antonio River and its tributaries.

There is no manufacturing within or near the county and the main dependence of the population is upon agriculture and cattle grazing. Floresville, with a population of about 1,200, is the county seat and largest town.

Wilson County is crossed by the San Antonio and Aransas Pass Railway and the Galveston, Harrisburg, and San Antonio Railway, which furnish communications with all the large markets of the State. No part of the county is more than 13 miles from a railroad.

The climate of the county is mild, equable, and healthful. Temperature during the summer is modified by the prevailing Gulf breezes and occasional hot days are nearly always followed by cool, restful nights. The annual rainfall is about 32 inches.

Wilson County is comparatively thickly settled, except in the deep sandy section and in the parts more remote from railroads. In the thinly settled sections stock ranching is still carried on, though on a much smaller scale than formerly. Cotton is the dominant crop, the production of corn not always supplying the home demand. Other crops grown are sorghum, peanuts, sweet and Irish potatoes, cowpeas, Johnson grass, some fruits, such as peaches and pears, and a very few vegetables. So far very little attention has been paid to specialization in the adaptation of the soils to crops, to the rotation of crops or to intensive methods of cultivation. In general the heavier soils of the county are preferred as being the more productive. Probably not more than one-fifth of the area of the county has ever been under cultivation.

The prices of farm lands have advanced within the last few years, owing to the high prices of cotton, but are yet, on a basis of their earning capacity, remarkably cheap. Farms can be secured for $3 to $35 an acre.

Wilson County lies wholly within the Gulf Coastal Plain and its soils are very largely the weathered products of marine deposits of Eocene Tertiary time. Twelve types, varying in texture from a loose, incoherent fine sand to a heavy clay, were mapped in the county. The various types are adapted to a wide diversity of crops and most of them are strong arable soils.

The Wilson clay loam is one of the most durable general farming soils in the county, it being well adapted to forage crops, such as sorghum and certain grasses, as well as to the staples.

The Wilson loam is also a productive soil, though more inclined to suffer from drought than the clay loam type and, therefore, requiring more careful methods of cultivation than some of the other soils.

The Norfolk fine sand has little agricultural value at present except for pasture. It is deficient in organic matter and would be much improved by growing leguminous crops for green manuring. Peanuts, sweet potatoes, and peaches do well and excellent yields of melons and grapes are obtained.

The Orangeburg fine sand is somewhat more productive than the Norfolk fine sand and is adapted to about the same crops.

The Orangeburg fine sandy loam is not as productive as the heavier black prairie soils, but is adapted to a greater diversity of crops. In very dry years, with the methods now in use, larger yields are obtained from this type than on the prairie soils, but in other seasons the heavier soils generally lead. It is an excellent peach and a good truck soil, especially well adapted to melons, Irish and sweet potatoes, beans, peas, and peanuts.

The Webb fine sandy loam is a little more productive than the Orangeburg fine sandy loam and is adapted to the same crops and has about the same relation to climatic conditions.

The Webb loam is a strong soil and adapted to general farming and the staple crops.

Of the bottom land soils, the Wabash clay is most highly valued. It is one of the most durable in the area, and well adapted to the staple crops. Good yields of cotton and corn are also secured from the Austin fine sandy loam, while some of the truck crops do well. This type is inclined to be droughty unless methods of moisture conservation are used.

The Meadow is quite variable as to texture and depth of soil and subsoil. While it is subject to overflows, they are of short duration and do not seriously interfere with cultivation. The type is probably best adapted to the production of cucumbers, melons, tomatoes, and other vegetables.

The Bastrop fine sandy loam occurs as a terrace along the larger streams of the county. Good yields of cotton and corn are produced and also excellent yields of Irish potatoes and peanuts.

The Susquehanna gravel is hilly in character and covered with a growth of hardwood. Practically all of the type is too gravelly to be readily cultivated.

Only about one-fifth of the area of Wilson County is under cultivation, while almost the entire area, consisting as it does of productive soils of varied adaptations, could be used for farming or gardening. With the moderate prices now asked for land, and with the excellent shipping facilities, the county offers a fine opportunity for the agriculturist, whether he be a grower of the great staples or a specialist.

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