

SOIL SURVEY OF THE CORPUS CHRISTI AREA, TEXAS.

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DESCRIPTION OF THE AREA.

The Corpus Christi area is located on the Gulf coast in the southern part of the State of Texas in the northeastern part of Nueces County, and comprises 232,192 acres or about 363 square miles. It is bounded on the north by Nueces Bay and the Nueces River, which here forms the boundary between Nueces and San Patricio counties, on the east by Corpus Christi Bay and by the Laguna Madre, which

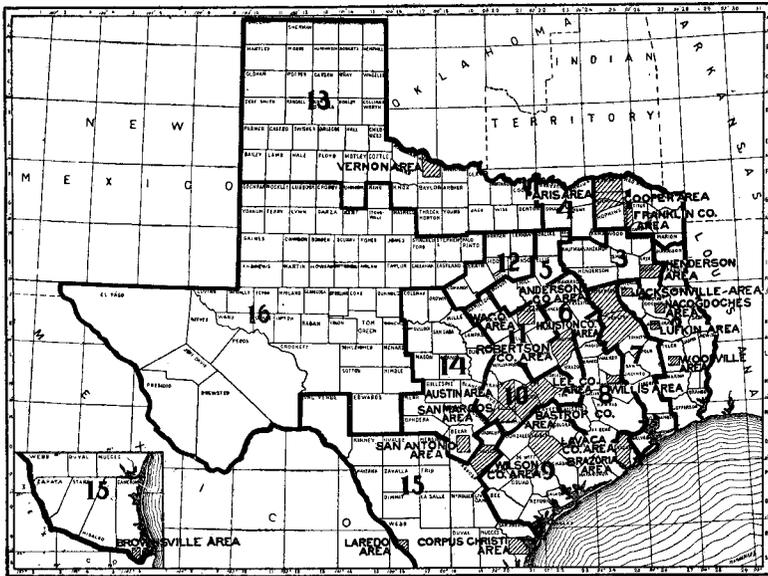


FIG. 23.—Sketch map showing location of the Corpus Christi area, Texas.

is a broad body of water lying between Padre Island and the mainland, and on the south and west by that part of Nueces County not included in the survey. The principal topographical features of the area consist of the broad level plains, the gently rolling hills adjacent to the river valley, and the low, flat delta lands which have been formed at the mouth of the Nueces River. The greater part of the area has the general appearance of a perfectly level plain, but low mounds and gentle swells give it, as a whole, a very gently undulating topography.

In the western part some of the low mounds or ridges reach an elevation of 75 to 80 feet above sea level, but this section is a comparatively level plain which slopes gently eastward toward the Gulf and ends abruptly at the narrow strip of level sand on the shore of the bay in a steep bluff, often more than 30 feet high. This broad plain was formerly an open prairie, supporting a heavy growth of native grasses, but during comparatively recent years the greater proportion of it has been covered by a thick growth of mesquite and cactus. Several large, open prairies, however, are found in the extreme southern and southwestern sections of the area, though these are also rapidly being covered with a low growth of running mesquite and cactus.

The topography of the uplands bordering the valley of the Nueces River is more rolling than that of the country situated farther back from the stream, although the summits of the rounded hills seldom reach an elevation equal to that of the higher knolls of the comparatively level plains. The hills are low and rounded and the intervening valleys are usually quite narrow. However, no deep gullies have been formed and the sandy soils have suffered very little from erosion, even along the steeper hillsides.

The land occupying the lower valley of the Nueces River, as well as that bordering Nueces Bay, is almost level, but low ridges or shallow depressions sometimes are encountered, causing it to have a gently undulating topography. These low "flats" have only a slight elevation above sea level and at times of high water are subject to overflow by the river. In some places the course of the river approaches the rolling uplands and the valley becomes very narrow or disappears altogether. The most extensive "flats" have been formed near the mouth of the river, where it empties into Nueces Bay, but the greater area of the low delta land occurs on the northern side of the stream just outside of the area.

There is a small peninsula in the eastern part of the area lying between the inlet at the mouth of Oso Creek and the Laguna Madre. The topography of this section is comparatively level, except along the northern coast, where a series of large sand dunes have been formed by the action of the winds. This peninsula is covered by a dense growth of scrub oak and other native vegetation.

With the exception of the low, flat lands which occur in the lower valley of the Nueces River and border Nueces Bay, the area as a whole is fairly well drained. The northern part of the area is drained by the Nueces River. This stream is perennial, but has no large tributaries within the area. Oso Creek in the south-central part of the area follows a general southeasterly course, emptying into an inlet of Corpus Christi Bay in the southeastern section of the area. This

stream is dry during the greater part of the year, but it has cut out a deep channel through the soft clay formation, and during times of heavy rainfall it serves as an outlet for the drainage from the lands bordering it. The extreme southwestern corner of the area is crossed by the Petronilla Creek. This is also an intermittent stream, but at times of rainfall it drains considerable land in the western and southwestern parts of the area.

There were very few settlers in the area prior to 1850, but during the decade 1850 to 1860 there were a number of settlers who came from England, Scotland, and Ireland and others from the older settled districts of Texas and from some of the northern and eastern States. From 1860 to 1900 the settlement of the area progressed very slowly, but during the last eight years (1900-1908) the population has increased very rapidly.

The agricultural development during the last five years has attracted many more settlers from the northern and eastern States, and at the present time (1908) the land is being taken up very rapidly by farmers from all parts of the United States. The majority of the farmers now settling in the area, however, come from Nebraska, Wisconsin, Illinois, Kansas, Iowa, Minnesota, and other Middle Western States.

The present population of the area also includes a large number of Mexicans. These are mainly the descendents of the Mexicans who inhabited this part of Texas before it was annexed to the United States. The greater proportion of the Corpus Christi area is very sparsely settled. During the last few years agricultural development has resulted in the rapid settlement of some parts, especially the lands adjacent to Corpus Christi and some of the smaller towns, which are now comparatively thickly populated; but the large cattle ranches in the southern and southwestern parts of the area are at present inhabited only by a few men engaged in stock raising. The more thickly settled districts are found along the main public roads, especially those leading south from Corpus Christi and the road following the valley of the Nueces River.

Corpus Christi, the county seat of Nueces County, situated on Corpus Christi Bay, in the southeastern part, is the principal town in the area and has a population of about 10,000. Robstown, in the western part of the area, at the junction of the St. Louis, Brownsville and Mexico Railway and the Texas Mexican Railway, and Calallen, situated on the St. Louis, Brownsville and Mexico Railway, in the northwestern part of the area, are also shipping points that are becoming of considerable local importance. The area around Corpus Christi, where most of the agricultural development has taken place,

is traversed by a well-kept system of public roads, but the roads have not yet been permanently established over much of the survey.

The St. Louis, Brownsville and Mexico Railway traverses the western part of the area and has a branch line extending into Corpus Christi. The Texas Mexican Railway, which extends from Corpus Christi to Laredo, Tex., crosses the central part of the area, and the northeastern section is traversed by a branch of the San Antonio and Aransas Pass Railway. These roads furnish means for quick transportation of all products of the area to the larger Texas markets and to northern and eastern States. Corpus Christi is the local market for all products.

Before the early vegetable crops are ready for shipment in carload lots small shipments are frequently made by express to the larger cities of northern Texas, to St. Louis, Kansas City, Denver, Chicago, and other northern markets. Almost the entire cabbage crop is shipped to markets west of the Mississippi River. The earlier shipments are usually sold on the more important Texas markets, but the greater part of the crop is shipped to the larger northern markets, such as Kansas City, St. Louis, Chicago, Denver, and St. Paul. A large part of the onions and cucumbers not sold on the Texas markets are shipped to Cincinnati, Cleveland, and Pittsburg and to the larger markets west of the Mississippi. San Antonio, Dallas, Fort Worth, Houston, Austin, and other Texas cities offer a ready market for the earlier shipment of truck, and also for the small shipments for the Christmas markets. Fort Worth is the principal market for all of the stock raised in the area, but a few are annually marketed at Kansas City and Chicago.

CLIMATE.

The climate is semitropical, and owing to the situation of the area on Nueces and Corpus Christi bays the temperature of this section, more particularly that part adjacent to the coast, is modified to a marked degree during both the winter and summer seasons by the prevailing Gulf winds. Farther inland, however, the moderating effects of the sea breezes are not so much in evidence, and as a result the thermometer falls lower in the winter and rises higher in the summer, while the air is naturally somewhat drier.

The prevailing winds are from the southeast during every month in the year except January and December, when they are northerly. These winds have a tendency to dry out the soil after each rainfall, and care should be taken to form a dust mulch on the surface by stirring the soil after each shower to conserve the moisture. During the summer months, shortly after sunrise, a fresh wind starts in from the

Gulf and continues for the remainder of the day and far into the night. These winds begin in March and last until November, alleviating the heat during the warm months. In December, January, and February cold north winds, locally known as "northers," occur at intervals of one to two weeks, and the temperature frequently drops several degrees in a few hours. These winds, coming in contact with the moisture-laden air from the Gulf, very frequently cause a fall of rain, and in such cases there is usually little danger of frost. It is only during a dry "norther" that vegetation is greatly endangered by a freeze. These "northers," however, seldom last more than two days, when the weather again becomes very mild and delightful, and remains so for several days. Because of this uniformity in temperature during all seasons, this section is rapidly becoming a great winter resort for northern people and a summer resort for the Texans from the interior of the State.

According to the records of the Weather Bureau station at Corpus Christi, the average annual rainfall for the past twenty years has been 27.18 inches. The highest monthly average for the same period is 4 inches for the month of September, while the lowest was 0.32 inch for December. Aside from these variations the rainfall is fairly well distributed throughout the year.

The temperature is remarkably uniform, there being in a nineteen-year average, according to the records of the Weather Bureau station at Corpus Christi, a difference of only 29.2° between the average for January, the coldest month, and July, the hottest. The average temperature for July for nineteen years is 82.70° F., while the highest ever recorded in this or any other month was 98° F. Only at rare intervals does the thermometer go above 90° or 95° . The average temperature for January during this same period was 53.5° F., although in a few cases the thermometer has gone as low as 16° or 18° , but a temperature lower than 27° or 28° is unusual, and only once in four years, on an average, has a killing frost been recorded in this the coldest month.

During the twenty years that the Corpus Christi Weather Bureau station has been in operation the average date for the first killing frost was December 25 and for the last killing frost February 27. The earliest date of a killing frost ever recorded is November 30 and the latest recorded is March 19.

The following table gives statistics of weather, compiled from the records of the Weather Bureau station at Corpus Christi:

Normal monthly, seasonal, and annual temperature and precipitation, Corpus Christi.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	Inches.	Inches.	Inches.	Inches.
December	58	86	20	1.3	0.4	0.9	0.0
January	56	82	16	2.3	0.8	1.9	0.4
February	58	88	11	2.2	1.3	3.5	0.3
Winter.....	57	.....	.....	5.8	2.5	6.3	0.7
March	64	96	28	1.8	0.1	3.0	0.0
April	70	92	44	1.5	0.4	1.4	0.0
May	76	96	44	2.7	1.4	8.7	0.0
Spring	70	.....	.....	6.0	1.9	13.1	0.0
June.....	80	97	59	2.6	1.0	5.5	0.0
July	82	98	68	1.8	1.3	2.2	0.0
August	82	98	65	2.4	2.5	2.2	0.0
Summer.....	81	.....	.....	6.8	4.8	9.9	0.0
September.....	79	97	54	3.9	7.2	7.2	0.0
October	73	91	42	2.0	0.4	2.9	0.0
November.....	64	89	20	2.3	0.7	8.6	0.0
Fall.....	72	.....	.....	8.2	8.3	18.7	.....
Year	70	98	11	26.8	17.5	48.0	0.7

AGRICULTURE.

From the date of the first settlement to comparatively recent years stock raising was the predominating agricultural industry, and this whole section was formerly one broad, open range for cattle. The stock was branded by the owners and allowed the freedom of the open prairies, but later, when the barbed-wire fences came into general use, the large pastures were fenced off and more attention was given to the improvement of the stock.

The raising of sheep was a very important industry during the early seventies and a large quantity of wool was annually exported from the area, but during the decade 1880 to 1890 this industry began to decline and was finally abandoned, the larger pastures being utilized exclusively for the raising of horses and cattle.

During the last ten years the number of cattle raised in the area has fallen off considerably. This is mainly due to two causes—first, the rapid agricultural development which has taken place in recent years has caused the land near the local markets or within reach of the local shipping points to become too valuable for trucking and

general farming to be utilized for pasture; second, a large proportion of the land which formerly supported a heavy growth of native grasses has become covered with a dense growth of mesquite, cactus, and other native vegetation, making it of little value as a range for cattle. Stock raising, however, is still an important industry and is carried on extensively in both the south and southwestern sections.

The beginning of the real agricultural development is of comparatively recent date. As long ago as 1880 there were a few farmers engaged in truck growing on the lighter soil along the Nueces River. The areas under cultivation, however, were small and the crops produced were not more than enough to supply the demands of the local markets. From this time up to about 1890 or 1892 there was very little increase in the acreage under cultivation.

About 1892, however, the growing of truck on a more extensive scale to supply outside markets was begun in the Sunshine country south of Corpus Christi, and the success of this enterprise resulted in a rapid increase in the acreage devoted to these crops. The agricultural development of the area, however, progressed very slowly until about 1902 or 1903, as it was not until that time that the real value of this section of the State for truck growing was recognized. The growing of cotton began about 1903 and this has become the principal general farming crop of the area. Sufficient corn is usually produced for local use, while the growing of early vegetables easily ranks as the principal industry in the area at the present time.

The importance of this country as a truck-growing section depends mainly upon the earliness with which crops can be marketed. When areas farther north are marketing their own vegetables, attention here is given to growing cotton, corn, and forage crops.

Up to the present time no irrigation of any consequence has been practiced. Water can be obtained from the Nueces River by pumping to irrigate a considerable area. So far attempts to obtain water for irrigation from artesian wells have not been successful. Well water is found at comparatively shallow depths throughout the area, but is usually brackish. With proper methods of cultivation the rainfall is sufficient to produce good yields.

The climatic conditions of the area are such that farm operations can be carried on every month in the year, while two and sometimes three crops may be grown on the same field in a single year. This practice, as a rule, is not advisable, since better crops and more profitable yields can be secured if, after the removal of one crop, time and attention be given to conserving the moisture for the next year's crop.

The principal truck crops grown at the present time are cabbage, cucumbers, onions, beans, peas, lettuce, beets, radishes, sweet and Irish potatoes, cauliflower, carrots, and spinach.

Cabbage, which is grown to a greater extent than any of the other truck crops, as a rule gives the largest returns. It has the advantage of being a crop which seldom fails to give profitable yields, and there is always a good market for it. As is the case with all other crops, however, the yield depends largely upon the rainfall. On the average about 15,000 pounds per acre are obtained. The seed are sown in the fall, from September to November, in drills 3 to 3½ feet apart, and when the young plants have attained sufficient size they are thinned out to about 18 to 24 inches apart. Transplanting is practiced to a limited extent, but in the operation the taproot is liable to be destroyed, and such plants seem to be unable to withstand drought as well as those that have been undisturbed. If a dry period happens to occur just at the time when it is desired to transplant, many plants will be lost or the work so delayed as to make the crop mature later, which means a lower price and consequently less profit. Harvesting usually begins the latter part of January, the first carload shipment being made early in February and continuing until late in April. The varieties which seem best adapted to the soil and climatic conditions of the area are the Flat Dutch and Ideal. The Winningstadt and Early Jersey Wakefield are also grown to some extent, but as these varieties have pointed heads instead of flat they are not so marketable.

Onions are grown quite extensively and are second in importance of the truck crops. They are sown in drills 14 to 18 inches apart, from September to November, and after having made a good start are thinned out to about 2 to 4 inches apart. Harvesting begins the latter part of March and continues until the middle of May. The average yield is about 7,000 to 8,000 pounds per acre. There is usually a ready sale for the crop at good prices. The white Bermuda is the principal variety grown.

A small acreage of Irish potatoes is annually put in. The crop is planted in January, and harvesting begins about three months later, usually during the latter part of March or early in April. The yield averages from 50 to 75 bushels per acre, and the crop brings high prices—usually \$1.50 to \$3 per bushel. The Bliss Triumph is the variety most commonly grown.

Cucumbers are probably next in importance to cabbage and onions. They are planted from February 15 to March 15 in rows about 4 or 5 feet apart, and the plants are subsequently thinned out to three in a hill. Marketing begins the latter part of April. The average yield of the crops is hard to estimate, but is said to be about 100 bushels per acre. The improved White Spine seems well adapted to the soils and climatic conditions, and is the variety commonly grown.

A considerable acreage is annually devoted to beets, carrots, and turnips. The seed are sown in October and November, and harvesting

on a large scale begins late in February. Small shipments are frequently made for the Christmas market. These crops do very well, and a profitable yield can usually be depended upon, but the market is rather uncertain. In some years there is no difficulty in disposing of the entire crop at a good profit, while in other years there is little demand.

Peas and beans are grown for both the fall and spring markets. The fall crop is planted in September, and is usually marketed before Christmas, although in some seasons the first frost is so late that the marketing continues until about January 1. The spring crop is planted in February, and is marketed the latter part of March or early in April. The principal varieties of beans grown in the area are the Black Wax and Valentine, nearly all of which are sold for string beans, comparatively few shell beans being grown. From 100 to 200 bushels are harvested from an acre. A small acreage is put in peas each year. Only the extra early varieties are grown. Both peas and beans have proved very profitable crops to the truck growers.

Tomatoes are grown very successfully, especially on the lighter textured soils. The seeds are planted in hotbeds about the 15th of December, and the plants are removed to the cold frame about the middle of January. The date of setting the plants in the field depends largely on the weather, but is usually about the 20th of February. The first crop will then be ready for gathering about the 1st of June. As a rule tomatoes yield well and bring a very fair price, and as there is always a ready market for them they are a very desirable crop. The Dwarf Champion is the favorite variety with a large number of the farmers.

Sweet potatoes and melons have been grown in favorable seasons; very fair yields are obtained on the sandier soils. Large yields, however, require irrigation.

Cauliflower has been grown to a very limited extent, but for some reason has not met with general approval. Lettuce does very well, especially on the Victoria loam, and large shipments are made throughout the winter season. Radishes and eggplant are very successful crops, though as yet no large shipments have been made.

A small acreage is sown in oats for winter pasturage. Kafir corn and sorghum cane have also some importance as forage crops. A few farmers grow enough corn for their own use. The best results are obtained from the Mexican corn, which seems to be well adapted to the soil and climatic conditions. The average yield is about 20 to 30 bushels per acre.

Cotton does well, especially on the Victoria clay and Victoria loam. It is usually planted in February and March and picking begins early in July. The crop should be put in as early as possible, as the early

maturing crop is not so liable to be damaged by the boll weevil as that maturing later in the season. For this reason it is not generally advisable to plant cotton late in the spring as a second crop on the land used for early truck. The early crop has the additional advantage of being on the market earlier in the season, when the price is usually high. The yield per acre varies considerably, as it is influenced by the season, type of soil, and methods of culture used. The average is one-half bale to 1 bale per acre, and as much as $1\frac{1}{2}$ bales per acre has occasionally been reported.

Cowpeas thrive on all types of soil, and this crop is beneficial, keeping the soil in a productive state, especially in case of the lighter types, such as the Victoria fine sandy loam and Nueces fine sand. The experience of the truck farmers shows that where cowpeas are grown and turned under larger yields are obtained than from the new lands when cultivated for the first time.

Fruits such as figs, oranges, lemons, and peaches are grown to such a limited extent that up to the present time nothing definite is known in regard to the local adaptation of soil and climate to these products. There are only a few fig trees in the area, yet just outside of the area and on a soil similar to the Victoria clay there is a large orchard of fig trees in a flourishing condition and giving fair yields. The few orange and lemon trees seen are apparently doing well.

The greater proportion of the farming land in this area has been under cultivation for such a short time that very little attention has been paid to the particular adaptation of crops to the various types of soil, but it is generally recognized that the Victoria clay is the most productive soil and makes the best land for cabbage, cotton, and general farming. Onions are better adapted to the Victoria loam, while tomatoes do better on the Victoria fine sandy loam. When fertilizer is used and careful cultivation given, the Nueces fine sand seems well adapted to melons and sweet potatoes.

As a rule no definite system of rotation is practiced in the area, though it is generally recognized by the farmers that crops do better when some system of rotation is followed. In a few cases the land is under cultivation the whole year and as soon as one crop is harvested another is planted. After the spring crop of peas or beans has been marketed the land is often put in corn, cotton, or sorghum, which will mature in July or August. The land is then plowed and the fall crop of peas or beans is planted. Another and more common practice is to plant cotton after the early crop of cabbage has been harvested.

Many farmers do their plowing in July and August, but a better method for this section and one that is followed by a number of the most successful farmers is to go over the land with a disk harrow as soon as the crop is removed, whatever time of year this may be. After this the land receives a disk harrowing after every rain, or at

least often enough to keep the weeds down. Just before planting the land is plowed, after which it is gone over with a disk harrow and finally with a smoothing harrow. This method keeps the soil in condition to absorb any rain that falls and at the same time prevents excessive loss of soil moisture by evaporation.

The depth of plowing varies, but is usually from 4 to 6 inches. The breaking is generally done with sulky disk plows drawn by three or four mules, although many farmers still use the walking moldboard plow. Gang plows drawn by steam or gasoline engines are being used to a limited extent. Cultivation begins as soon as the crop has attained sufficient size and is kept up at intervals of eight to ten days throughout the season, until the crop is harvested. These cultivations are shallow, being just deep enough to keep a dust mulch on the surface at all times, thus preventing the excessive loss of moisture by evaporation. It is necessary to hoe many of the crops several times during the growing season in order to keep out the weeds which grow up rapidly between the rows. Comparatively little commercial fertilizer has been used up to the present time (1908), but it is now gradually coming into use on the sandy soils. Applications on these soils range from 300 to 600 pounds an acre.

The labor employed on both the farms and cattle ranches is largely Mexican, is fairly efficient, and usually plentiful at all seasons. The farm laborers receive from 75 cents to \$1 a day with board, and when hired by the month from \$15 to \$20.

The cost of clearing the land of mesquite, cactus, and other vegetation varies from \$7 to \$25 an acre. Where the small bushy growth known as running mesquite occurs the cost is seldom less than \$10 to \$15 an acre, as this variety of mesquite has an extensive root system which must be removed before the land can be put under cultivation. Mexican laborers frequently take contracts for clearing large tracts of land at a stipulated price, varying from \$8 to \$25 an acre, according to the character of the growth.

The area includes parts of several cattle ranches which have not yet been divided into smaller tracts or developed agriculturally. Some of these ranches contain from 100,000 to 200,000 acres. In the more thickly settled districts, however, where the greatest agricultural development has taken place, the larger ranches have been divided into tracts of 20 to 200 acres. Some of the larger farms, where cotton and other staple crops as well as truck are produced, now have several hundred acres under cultivation, but the average truck farmer seldom cultivates more than 35 or 40 acres, and many near the local markets are profitably handling a much smaller acreage than this. A very large percentage of the truck farms in the area are operated by the owners. In addition a small acreage is annually rented for truck growing, the price being \$8 or \$10 an acre.

On the larger farms, farther away from the local markets, a considerable acreage is cultivated by tenants, who farm the land on shares. In most cases the landowner furnishes nothing but the land and receives one-fourth of the cotton and one-third of the grain produced. If the landowner also furnishes the seed, work animals, and farming machinery he receives one-half of the crops.

The value of the farm lands of the area varies considerably with the location of the land, the character of the soil, and the character of the improvements. Unimproved land at a distance from the local shipping points and markets is valued at \$15 to \$40 an acre, while some of that highly improved, in a good state of cultivation, and located near the local markets and shipping points, is valued at \$150 to \$200 an acre.

Deep plowing, shallow surface cultivation at frequent intervals, and the use of some system of crop rotation in which cowpeas are included are methods suggested to improve the soils of the area. Stable manure will also be found very beneficial both in increasing the productivity and improving the physical condition of most of the soils in the area.

SOILS.

The soils encountered in the Corpus Christi area may be separated broadly into three classes—those derived mainly from the clay marl and calcareous clay formation which underlies the broad, comparatively level plains; those derived from lighter deposits of sand which have been laid down on the older formations during recent geological time; and the alluvial deposits laid down along the valley and at the outlet of the Nueces River. The calcareous clay formation is found beneath the greater part of the level upland sections of the area and has an average thickness of several hundred feet. This material weathers very rapidly, forming a heavy black clay soil, locally known as “black land” or “hog-wallow land,” which occupies a very large proportion of the survey. When bodies of this soil border those of a light sandy texture a considerable quantity of fine sand has drifted over the level plains and become mixed with the heavier material, forming a dark-brown loam which contains considerable sand in the surface 10 to 12 inches, but rapidly becomes heavier with depth. Areas of loam often occur which are not adjacent to areas of fine sand or fine sandy loam. These loamy spots are probably the remains of old sand ridges or dunes, the fine sand having been deposited over the calcareous clay by the action of the winds. This loamy soil, which has been classed as Victoria loam, represents the intermediate type between the heavy black clay, indicated on the soil map as Victoria clay, and the fine sandy loam, mapped as Victoria fine sandy loam. The large area of fine sandy loam extending across the northern part of the survey and bordering the bluff which at one time

formed the coast of Nueces Bay also owes its origin to sand drifts, formed along this old coast line by the winds.

Small areas of drifted sand are sometimes encountered farther back from the coast, but a large part of the fine sand has been carried away by the winds and redeposited over the adjacent areas of heavy clay, forming small bodies of Victoria loam and leaving only a shallow deposit of fine sandy loam capping the summits of the low mounds. The small peninsula in the southeastern part of the area is covered by a deep deposit of wind-blown sand and a series of large sand dunes has been formed along the northern coast. The eastern side of this peninsula forms the coast of the Laguna Madre, and the sand here has been drifted inland and covers the underlying formation of clay to a depth of many feet. There is only a very narrow strip of beach sand at the base of the bluff which forms the coast line of the greater part of the area, but a large proportion of the small peninsula in the extreme northeastern corner of the area consists of a narrow beach of sand and shells which has been formed by the action of the waves. Several other small beaches of like character occur along Nueces Bay. These beaches are composed of a compact mass of sand and shells, cemented with lime, but they are of limited extent and of no agricultural value.

The soil occupying the low, poorly drained "flats" that lie near the outlet of the Nueces River and border Nueces Bay has been formed by the gradual filling up of the shallow bay by material held in suspension by the waters of the river. The large quantity of silt and clay brought down by the waters of the river was deposited in the shallow waters of the bay, eventually building up broad clay "flats" which later became covered with a growth of coarse marsh grasses. As this deposition of silt and clay continued, the extent of these salt marshes gradually increased and the surface of the area laid down early in the formation of this delta was gradually built up above the level of the bay. A large quantity of material was carried out by the currents and deposited in the shallow water along the shores, eventually forming the low semimmarshy land which borders the bay on each side. A large proportion of these low "flats" has at present only a slight elevation above sea level and is very poorly drained and subject to overflow from the river, though it is never covered by the waters of the bay. Alkali is often found in this soil in sufficient quantity to be harmful to crops, and this together with its poor natural drainage makes it of little agricultural value.

The soil which occurs farther up the valley of the Nueces River is very closely related to that occupying these poorly drained flats, as it also owes its origin to the deposition of silt and clay by the waters of the river. The material forming the soil, however, was deposited

along the old flood plain of the stream at times of overflow and was not primarily laid down in the salt waters of the bay. This land is also subject to overflow and has poor natural drainage, but is comparatively free from alkali.

Seven types of soil, including the Coastal beach, were encountered in the survey. Several of these types are very similar to some found in other sections of the State, both as to texture and geological origin. The Victoria clay in this area is quite similar in texture and topographic features to the heavy black clay found in the Austin, Waco, San Marcos, and other areas of Texas. The Victoria loam in this area also has many of the characteristics of the soils of similar origin found in some other Texas areas. It usually occurs wherever the black clay soil grades into those of a light sandy character. The Lomalta clay, occupying the poorly drained areas along Nueces Bay and the low valley of the Nueces River, is similar in texture, origin, agricultural value, and drainage conditions to the soil mapped as that type in the Brownsville area, Texas. The Corpus Christi clay has many of the characteristics of the heavy clay soil occupying the valleys of many of the larger streams which traverse the black prairie belt in other sections of the State.

The following table gives the names and areas of the several soil types shown on the accompanying map:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Victoria clay.....	165,184	71.1	Corpus Christi clay.....	1,024	0.5
Victoria loam.....	40,896	17.6	Coastal beach.....	832	.4
Nueces fine sand.....	9,920	4.3	Total.....	232,192	
Victoria fine sandy loam.....	9,536	4.1			
Lomalta clay.....	4,800	2.0			

LOMALTA CLAY.

The soil of the Lomalta clay, to an average depth of 10 inches, consists of a dark-brown clay or heavy silty clay, which is very stiff and tenacious when wet, but which becomes hard, baked, and sun-cracked and covered with a baked grayish crust when dry. The soil grades into a stiff clay subsoil of light-brown to drab color, which rapidly becomes lighter in color as the depth increases, until at a depth of 30 to 36 inches it is a very light drab, sticky, tenacious clay. At lower depths it often contains small concretions of lime.

This soil is found in the northern part of the area, occupying the low "flats" which occur in the lower valley of the Nueces River and along Nueces Bay. The topography is almost level, but low, shallow basins or swampy depressions which remain wet during the greater part of the year are seen at frequent intervals.

Most of these flats have only a slight elevation above sea level, and the natural drainage of the whole type is poor. In many localities, especially in the area near the outlet of the Nueces River and in those bordering Nueces Bay, the water table is often encountered within 2 or 3 feet of the surface, and the deeper subsoil remains in such a thoroughly saturated condition that it is soft and plastic.

The soil owes its origin to the deposition of the silt and clay held in suspension by the waters of the Nueces River. The material was first laid down in the shallow waters of Nueces Bay, gradually building up clay flats, which later became covered with a growth of coarse grasses. A large quantity of silt was deposited annually over these salt marshes and they were eventually built up above the level of the salt waters of the bay. Small areas of salt marsh found along the shores of the bay and at the mouth of the river represent the early stages in the formation of this type.

Alkali occurs in both the soil and subsoil of the Lomalta clay, sometimes running as high as 3 per cent. The salts consist chiefly of the chlorides and sulphates of sodium. It will be difficult to free the land of alkali, owing to its low topographical position and poor drainage facilities. Small bodies in the upper part of the area occupied by this type are fairly well drained and are comparatively free from alkali, but they are subject to overflow by the river at times of high water. The alkali found in this soil owes its origin to salt water.

None of the Lomalta clay is at present under cultivation. It supports a growth of coarse grasses and is utilized mainly as pasture land for stock.

The following table gives the results of a mechanical analysis of this soil:

Mechanical analysis of Lomalta clay.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
18367	Soil.....	0.0	0.0	2.1	26.0	21.9	27.9	20.6

NUECES FINE SAND.

The Nueces fine sand consists of 12 to 15 inches of loose, gray, fine-textured sand, often containing enough silt, clay, and organic matter to make it slightly loamy, underlain by a fine sand having about the same texture, but containing less organic matter than the surface soil. The subsoil gradually becomes lighter in color as the depth increases until at about 36 inches it is a very light gray. At this depth it is usually compact and moist. A stiff, slightly mottled, light-drab clay underlies the deposit of fine sand at an average depth of 3 to 5 feet

below the surface. The surface soil, however, is loose and incoherent, and the depth of the sand deposit varies considerably on account of drifting. A series of low sand dunes has been formed along the northern coast of the peninsula occupied by this soil. Here the sand is much deeper and the soil is at present of no agricultural value. The area covered by these sand dunes is very limited in extent.

The Nueces fine sand is found in one large, unbroken area, occupying the greater part of the small peninsula which lies between the inlet at the mouth of Oso Creek and the Laguna Madre in the southeastern part of the area. One other small area is found bordering an old inlet of Nueces Bay, in the northern part. With the exception of the localities occupied by sand dunes, the surface is comparatively level. Small basins and shallow depressions occur at intervals, and these, together with the low mounds and ridges formed by the drifting sand, give rise to a gently undulating topography. The light, sandy texture of the soil tends to make the natural drainage very thorough, but the heavy clay underlying the subsoil prevents its excessive drainage, and this, together with the loose character of the surface soil, which reduces loss by evaporation, tends to maintain a supply of moisture within the reach of deep-rooting plants.

The deposit of fine sand, from which this soil is derived, was originally deposited along the beaches, but has later been drifted inland by the wind and laid down as a shallow covering over the older formation of heavy clay. Very little cactus or mesquite is found on this soil, but it supports a heavy brushy growth of other native vegetation.

Such a limited acreage of this soil is under cultivation that little is known in regard to its agricultural value. It is easily cultivated, but so loose and incoherent that care must be taken to prevent drifting. Very fair yields of melons and sweet potatoes have been secured, especially when such methods of cultivation were practiced as tended to conserve moisture in the soil. A limited acreage has been planted to cotton, and a yield of about one-half bale per acre secured. Fair yields of early vegetables have also been obtained during favorable seasons. At the present time (1908) the greater proportion of the area occupied by this soil is utilized as pasture land. This land is valued at \$25 to \$35 an acre.

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

Mechanical analyses of Nueces fine sand.

No.	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.	<i>Per cent.</i>
18371	Soil.....	0.0	0.3	0.9	80.3	8.5	6.2	4.5
18372	Subsoil.....	.0	.1	.4	85.5	6.3	7.0	1.5

VICTORIA CLAY.

The soil of the Victoria clay, to an average depth of 10 inches, consists of a heavy dark-brown to black clay. A small percentage of fine and very fine sand is present in the soil, but the clay content is so great that the surface of the uncultivated areas becomes baked and sun-cracked when dry and very sticky and tenacious when wet. The surface material grades at 10 to 12 inches into a heavy, compact, calcareous clay, which is slightly lighter in color than the surface soil and often contains small concretions of lime. It usually carries less sand than the surface soil and its color gradually becomes lighter as the depth increases, until at 2 to 5 feet it is a light drab to slate gray.

When properly managed this is the most productive soil in the area, but it is not so easily tilled as some of the lighter textured soils. When wet, especially, the soil is very difficult to handle, but when in the proper moisture condition, areas which have already been under cultivation break up into a loamy, friable soil. The hard, baked condition of the surface, however, makes the breaking of new lands extremely arduous. With care the Victoria clay may be kept in a state of thorough cultivation, and profitable yields of almost all the usual crops may be secured without the aid of fertilization. A very large proportion of the entire upland section of the area is occupied by the Victoria clay. The topography of these uplands, while in general almost level, consists of alternating shallow basins and low, gentle swells, giving the type as a whole a very gently undulating surface. In a region of greater rainfall the level character of the plains occupied by this type would result in very poor drainage, but in an area where it is necessary to conserve all of the rainfall possible this feature is an advantage, as the rain water is not carried off rapidly through natural drainage channels, but is slowly absorbed by the soil. Several small arroyos, or wet-weather streams, traverse the plain and serve as an outlet for any excess of water at times of heavy rainfall.

The Victoria clay owes its origin to the weathering of a deposit of calcareous clays which covers the older geological formations to a considerable depth. The clay formation contains a large quantity of lime and when freshly exposed in deep cuts it is much lighter in color than the material found nearer the surface. It weathers rapidly on exposure, forming a dark-brown to black soil.

The Victoria clay, as it is found in this area, is very uniform in texture, color, topographical features, and agricultural value. Small areas, however, occur in some localities, where the surface soil, owing to the presence of a thin coating of sand, is slightly lighter in color than is typical. Along the contact with the Victoria loam or Victoria fine sandy loam a thin coating of sand has been blown over the surface

from these soils, but there is a small quantity of fine sand everywhere in the soil, and where the surface becomes very dry, the finer particles of silt and clay are carried away by the winds, leaving the thin coating of sand on the surface of the areas found at a distance from the lighter types. The sand causing the grayish appearance of these small areas does not appear to be sufficient to influence the texture of the soil, being only a very thin coating over the heavy clay. Several small shallow basins, where water stands after heavy rainfalls, are found in the western and southwestern parts of the area. The surface of these basins also has a lighter appearance than that of the land surrounding them. This is due to the fine sand and silt which have been washed into the basins from the surrounding areas. The soil becomes thoroughly saturated with water in these basins, and on drying the surface becomes hard, baked, and sun-cracked, causing great difficulty in cultivation. Such areas, however, do not occur frequently and are of very limited extent.

The section of the area occupied by the Victoria clay was formerly an open prairie, supporting a heavy growth of native grasses, but during comparatively recent years the greater proportion of the land has become covered with mesquite, cactus, and other vegetation, greatly decreasing its value as pasture. There are large bodies in the southern and southwestern parts of the area which are not covered by a heavy growth of mesquite, but these usually support a low bushy growth of running mesquite which must be removed before the land can be put under cultivation. As already stated, the extensive root system of this plant makes the clearing of the land much more difficult than appearances indicate.

The Victoria clay is considered the best soil in the area for general farming, and when well cultivated it produces very profitable yields of the various truck crops. It is well adapted to cotton, cabbage, and cucumbers and also gives fair yields of peas, corn, and other crops adapted to the climate. Figs and other fruits are grown only to a very limited extent, but with proper care and attention figs can be grown very successfully on this type of soil. The average yield of cotton in a season of normal rainfall is estimated at three-fourths bale per acre. In favorable seasons a yield of 1 bale to $1\frac{1}{2}$ bales per acre has been secured. Cabbage yields average 12,000 to 15,000 pounds per acre, and a yield of 18,000 to 20,000 pounds may be made in particularly favorable seasons. Cucumbers do well on this soil, the average yield being estimated at 75 to 100 bushels per acre. Onions do fairly well, considering the clayey character of the surface soil, producing an average yield of 7,000 to 8,000 pounds per acre in a favorable season.

The value of the Victoria clay varies from \$20 to \$150 an acre, according to its location and the extent of improvement.

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

Mechanical analyses of Victoria clay.

No.	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.	<i>Per cent.</i>
20324	Soil.....	0.0	1.0	0.5	8.9	17.6	34.9	37.2
20325	Subsoil .....	.0	.4	.4	8.2	18.9	30.9	41.2

CORPUS CHRISTI CLAY.

The soil of the Corpus Christi clay is a heavy dark-brown to black clay, with an average depth of 10 to 12 inches. The subsoil, from 12 to 36 inches, is very similar in texture to the surface soil, but contains less organic matter and is slightly lighter in color. Owing to high silt and clay content, this soil is very difficult to cultivate when wet or when it has become baked or sun cracked, but if plowed when in the proper condition it becomes somewhat loamy and friable.

The Corpus Christi clay occurs in the valley of the Nueces River in the northwestern part of the area. The topography is comparatively level, but small, shallow depressions or narrow sloughs which have the appearance of old abandoned stream channels are encountered in the larger areas.

These low valley lands receive the drainage waters from the neighboring uplands and their level topography and slight elevation above the level of the river result in very poor drainage. A large part of the type is subject to overflow during high water.

The Corpus Christi clay is alluvial, having been formed from the silt and clay deposited by the river. These alluvial deposits were laid down in the valley of the river near its outlet into Nueces Bay, but there are no indications to show that this material was primarily laid down in the salt waters of the bay or that the areas were formerly salt marshes similar to those now found near the present outlet of the stream. A small percentage of alkali was found in this soil, consisting chiefly of the chlorides and bicarbonates of sodium. The alkali content, however, is small, usually ranging from 0.20 to 0.50 per cent.

Very little mesquite or cactus is found on this type, but it supports a heavy growth of huisach (*Acacia farnesiana*) and several other species of plants.

Only a very limited acreage of this soil has been put under cultivation and the crops grown have occasionally been destroyed or seriously damaged by the overflow of the river. With these exceptions

very fair yields of corn have been secured and small areas of cabbage and other garden truck have been successfully grown on the better drained land. The greater proportion of the Corpus Christi clay is utilized as pasture land.

COASTAL BEACH.

Small areas composed of a compact mass of shells and sand cemented with lime occur along Corpus Christi Bay in the northern part of the area and at intervals along the shore of Nueces Bay. These beach deposits, thrown up by the action of the waves, are of slight extent and of no agricultural value. In addition to these areas there is a narrow strip of beach sand occurring along the base of the bluffs which border Corpus Christi Bay, but it is too narrow to be shown on a map of the scale used.

VICTORIA FINE SANDY LOAM.

The soil of the Victoria fine sandy loam is a light-brown to gray fine sandy loam, with an average depth of 12 to 15 inches. This is underlain by a light-drab sandy clay, which is often slightly mottled with iron stains. Thin local deposits of lime are often found scattered through the deeper subsoil. There is a distinct line of contact between the sandy surface soil and the underlying clay, but the upper part of the subsoil contains a larger percentage of sand than that found at a depth of 30 to 36 inches. The depth of the fine sandy loam soil often varies considerably within small areas, owing to the fact that when dry the loose surface material is shifted by the wind, forming small drifts. Small areas of the Victoria fine sandy loam are sometimes encountered, where the underlying clay has a reddish-brown color due to the large quantity of iron it contains. These areas, however, are rare in occurrence and are very limited in extent.

The Victoria fine sandy loam is easily reduced to a state of thorough cultivation, and crops on this type can be given a shallow surface cultivation immediately after rain without danger of forming clods or impairing the physical condition of the soil.

The larger bodies of this soil are found in the northern part of the area, occupying the uplands adjacent to the valley of the Nueces River. An extensive tract also occurs in the northeastern corner, extending in a northwesterly direction from the bluff along Corpus Christi Bay, just south of Corpus Christi, to the bluffs along Nueces Bay northwest of Corpus Christi. Other areas of very limited extent are found at intervals over the comparatively level upland section. The topography of the land bordering the valley of the Nueces River is quite rolling. The hills, however, are low and rounded, with shal-

low valleys intervening, and the slopes are seldom steep enough to cause serious erosion. The topography farther back from the river valley is less rolling, and the surface of some of the larger tracts is comparatively level or gently undulating. The smaller areas found in the broad, comparatively level plain, occupied mainly by the Victoria clay, usually occur as low mounds or ridges slightly higher than the surrounding land.

The topography and light sandy texture of the Victoria fine sandy loam insures good natural drainage. The heavy clay subsoil aids materially in preventing excessive drainage in the more rolling areas, and the loose fine sand which is constantly shifted over the surface by the wind prevents excessive losses of soil moisture by evaporation, so that crops on this type often suffer less from droughts than those on some of the soils of heavier texture.

The origin of the Victoria fine sandy loam can be traced to the drifting of sand from the old coast line of Nueces Bay to the adjacent areas, giving a shallow sandy veneer to the older formation of calcareous clay. The smaller areas farther back from the ancient coast line probably represent the remains of small sand hills, which have been almost entirely leveled by the winds.

The soil seems well adapted to the growing of early truck crops, but it is necessary to fertilize heavily in order to obtain large yields of onions and cabbage. It is well adapted to tomatoes and also gives yields of lettuce and melons equal to those obtained on any other type in the area. When shallow surface cultivation and other methods which tend to conserve the soil moisture are practiced the yields are always increased. Cotton gives an average yield of about one-half bale per acre where no fertilizer is used. When fertilized and properly cultivated much larger yields are secured. Corn is grown to a limited extent and produces about 20 bushels per acre.

Without fertilization the average yield of onions is estimated at about 5,000 pounds per acre, but where heavily fertilized and carefully cultivated a yield of 10,000 to 12,000 pounds per acre is often secured. Lettuce does exceedingly well and is a very profitable crop. Cowpeas and beans also do well and are also beneficial in keeping the soil in a productive state. Both Irish and sweet potatoes give fair yields. Sweet potatoes seem better adapted to this soil than to the types of heavier texture. Watermelons are grown to a limited extent and give good returns. Tomatoes also yield well and if properly cultivated the crop is seldom a failure.

This land is valued at \$25 to \$100 an acre, according to its location in the area and the extent of improvements on it.

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

Mechanical analyses of Victoria fine sandy loam.

No.	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.	<i>Per cent.</i>
18375, 18377.....	Soil.....	0.1	0.6	2.0	50.1	25.7	16.2	5.7
18376, 18378.....	Subsoil.....	.2	.8	1.7	34.2	11.0	23.6	27.7

The following sample contained more than one-half of 1 per cent of calcium carbonate (CaCO_3): No. 18376, 13.60 per cent.

VICTORIA LOAM.

The Victoria loam consists of 10 or 12 inches of light-brown to dark-gray loam grading into a light-drab to slate-colored clay, which contains a considerable quantity of sand near the contact with the loamy top soil, but becomes heavier and more compact as the depth increases. Small deposits of lime are found scattered through the subsoil.

The surface soil contains enough clay to make it slightly sticky when wet, but there is enough sand present to prevent it from forming into hard clods when cultivated and to give it a loamy friable character. The soil represents the type intermediate between the heavy Victoria clay and the lighter textured Victoria fine sandy loam. When the Victoria loam borders the Victoria fine sandy loam the surface soil contains higher percentages of sand than usual. This is due to the larger percentage of fine sand, which has been deposited along the boundaries of these two soils by the action of the wind. A very thin layer of this fine wind-blown sand is often found on the compact surface of the uncultivated land, giving it a slightly grayish appearance, and small areas, only a few square rods in extent, sometimes are seen where this sandy material has been formed into shallow drifts, giving the soil a slightly lighter texture than that of the typical Victoria loam. On the other hand, where this soil borders the Victoria clay, the loamy surface soil becomes shallower and the clay content gradually increases until it grades into the heavier black clay.

This soil is found in areas containing a few square rods to several square miles, scattered over the upland in almost every part of the survey. The topography is in general almost level, but in detail consists of low elevations and small shallow basins, making the surface of many of the larger areas gently undulating.

The natural drainage of the greater part of the Victoria loam is good, but some of the small shallow basins receive the drainage waters

from the surrounding land at times of heavy rainfall and remain in a wet condition until the water has evaporated. On drying, the surface of these small basins becomes hard, baked, and sun cracked and usually has a light grayish appearance.

The Victoria loam is formed by a mixture of the fine sandy material composing the lighter fine sandy loam or fine sand with the finer textured material of the heavy clay soil covering the greater part of the upland plains. Some of this fine sand was probably mixed with the heavier clay soil at the time of deposition, but the sand content of the greater proportion of this type has resulted from the action of the wind.

The soil supports a very heavy growth of a great variety of vegetation, principally mesquite and several species of cacti. With the exception of the few small basins mentioned above, where the natural drainage is poor, the land is very productive and is well adapted to truck, as well as to cotton and other general farm crops.

The Victoria loam is considered the best soil in the area for the growing of onions and is also well adapted to cabbage, lettuce, and cucumbers. Very careful cultivation, however, is necessary in order to get the best results on this soil. If deep plowing is practiced and the soil is kept free from weeds and is given a shallow surface cultivation at frequent intervals, a profitable yield is always secured. In seasons of ordinary rainfall the average yield of onions is estimated at 10,000 pounds per acre, and in years having a larger precipitation the yields may reach 12,000 to 15,000 pounds per acre. The average yield of cabbage is about 14,000 pounds per acre, but a yield of 20,000 pounds is not uncommon on areas which have been carefully cultivated. Okra has been grown to a limited extent and very fair yields obtained. Cucumbers do well, but require very careful cultivation, as the crop is liable to be damaged by drought.

Cotton gives an average yield of one-half to three-fourths bale per acre, but when fertilizer is used and the soil is properly cultivated a yield of 1 bale has often been obtained. Corn has been grown to a limited extent and yields on the average from 20 to 30 bushels per acre, with maximum yields of 40 bushels per acre under the most favorable conditions. Cowpeas do well on this type and should be included in the rotation of crops, especially on land which is cultivated throughout the year. Sorghum cane is another of the general farm crops grown successfully. At present only a limited acreage is planted. Two cuttings are usually obtained, and sometimes in a very favorable season three cuttings may be made. With the average rainfall Irish potatoes yield from 60 to 75 bushels per acre. The yield is usually very light in dry seasons. Sweet potatoes are also produced to a limited extent and with ordinary rainfall, when carefully cultivated, the yield is fair.

The undeveloped land of this type is valued at \$20 to \$50 an acre, according to distance from the local markets and a shipping point. The areas under cultivation are valued at \$50 to \$100, depending upon their location and the character of improvements.

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

Mechanical analyses of Victoria loam.

No.	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.	<i>Per cent.</i>
18355, 18357.....	Soil.....	1.1	4.1	2.5	21.0	16.5	36.1	18.4
18356, 18358.....	Subsoil.....	.0	.5	.8	35.4	18.8	21.3	23.0

The following sample contained more than one-half of 1 per cent of calcium carbonate (CaCO_3): No. 18358, 1.18 per cent.

SUMMARY.

The Corpus Christi area is located on the Gulf coast of South Texas and comprises 232,192 acres, or about 363 square miles, in the northeastern part of Nueces County. The greater part of the area is an almost level plain, the remainder, the country bordering the valley of the Nueces River, is generally rolling. The "flats" occupying the river valley are level and poorly drained.

Drainage is effected by the Nueces River and several large intermittent creeks. Although the area is thinly settled at present, the incoming population is considerable and agricultural development is progressing rapidly. The St. Louis, Brownsville and Mexico, the Texas Mexican, and the San Antonio and Aransas Pass railroads furnish good transportation facilities.

Corpus Christi, a town of about 10,000 inhabitants, is the principal town in the area and also the local market for all products.

The climate is very mild in winter and is not extremely warm in summer. The maximum temperature recorded at Corpus Christi during the past nineteen years is 98°. It is very unusual for the temperature to go below 27° or 28° in winter.

For a long while stock raising was the leading industry. In recent years, however, there has been rapid agricultural development, especially in the growing of truck crops.

Seven types of soil were mapped.

The Lomalta clay is an undrained soil in the northern part of the area, occupying low flats in the valley of the Nueces River and along Nueces Bay. None of this type is under cultivation. It supports a growth of coarse grass and is utilized mainly for pasture.

The Nueces fine sand is for the most part used as pasture land, though a limited acreage is cultivated, giving fair yields of cotton, melons, sweet potatoes, and early vegetables.

The Victoria clay, an upland type, when properly managed is the most productive soil in the area. This land was formerly an open prairie covered with a heavy growth of native grasses, but in recent years the vegetation has consisted largely of mesquite, cactus, etc., which has diminished its value as pasture land. Where cultivated good yields of cotton, cabbage, cucumbers, and onions are secured. If well cultivated various truck crops can be successfully grown. It is valued at \$20 to \$150 an acre.

The Corpus Christi clay is mainly pasture land, a comparatively small acreage being under cultivation. When not damaged or destroyed by overflows of the river fair yields of corn have been secured, and some garden truck has been grown on the better drained portion of the type.

The Victoria fine sandy loam seems well adapted to early truck crops, such as onions, cabbage, lettuce, melons, tomatoes, and potatoes, and gives fair yields of cotton and corn.

The Victoria loam, found in scattered areas over the upland in almost every part of the survey, is a productive soil. It is adapted to truck as well as to cotton and other general farm crops. It is considered the best soil in the area for the growing of onions. The native vegetation consists largely of mesquite and cactus.

The Coastal beach comprises small areas along Corpus Christi Bay and Nueces Bay. These beach deposits, thrown up by the action of waves, are of no agricultural value.

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