

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF ST. MARTIN PARISH,
LOUISIANA.

BY

A. H. MEYER, IN CHARGE, AND B. H. HENDRICKSON.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1917.]



WASHINGTON:
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1919.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., June 12, 1918.

SIR: I have the honor to transmit herewith the manuscript report and map covering the survey of St. Martin Parish, La., and to recommend that they be published as advance sheets of Field Operations of the Bureau of Soils, 1917, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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FIGURE.

FIG. 1. Sketch map showing location of the St. Martin Parish area, Louisiana. 5

MAP.

Soil map, St. Martin Parish sheet, Louisiana.

SOIL SURVEY OF ST. MARTIN PARISH, LOUISIANA.

By A. H. MEYER, In Charge, and B. H. HENDRICKSON.—Area Inspected by
HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

St. Martin Parish is situated in the southern part of Louisiana, about 90 miles west of New Orleans and about 40 miles north of the Gulf of Mexico. The southeastern part of the parish is separated from the main portion by a strip of Iberia Parish about 10 miles wide. The main part of the parish is bounded on the north by St. Landry Parish, on the east by Iberville Parish, on the south by Iberia Parish, and on the west by Lafayette Parish. The detached portion lies between Assumption and St. Mary Parishes. In a number of places the parish line could not be definitely located. The survey comprises an area of 692 square miles, or 442,880 acres.¹

St. Martin Parish lies wholly in a region of alluvial soils. It includes three topographic divisions: The so-called upland or high terrace (third bottoms) in the southwestern part; the low terrace, or second bottoms, east of the high terrace; and the first bottoms, comprised mainly in the great swamp of the Atchafalaya River. The high terrace is part of an old flood plain of the Mississippi River; the low terrace is a part of another old but more recent alluvial plain of the same river, while the first-bottom lands are a part of the present flood plain of that stream.

The high terrace covers about 16 square miles. It lies about 20 to 30 feet above the first bottoms, or 25 to 35 feet above sea level. The surface of this terrace is a flat, apparently level plain, but in detail it

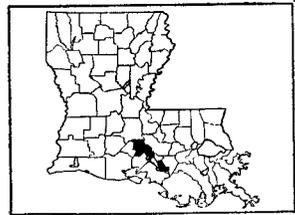


FIG. 1.—Sketch map showing location of the St. Martin Parish area, Louisiana.

¹ The base map for that part of the parish lying east of the area through which high-ways extend, that is, the large Atchafalaya River swamp area, classed chiefly as Sharkey clay, is based on the work of the General Land Office. The soils in this section were examined in only a general way.

is slightly varied by shallow basins, swells, and depressions along small drainage ways. It is separated from the low terrace and the first bottoms to the east by a steep bluff slope, which enters the parish about $2\frac{1}{2}$ miles north of Duchamp and crosses it in a southeasterly direction. Along this bluff streams cutting back into the uplands have produced narrow strips of gently rolling to undulating topography. In a few places the slopes are too steep for cultivation.

In the eastern part of St. Martin Parish there is an extensive area of the low terraces, covering about 200 square miles. On the east the second bottom merges imperceptibly with the main body of the Mississippi River first bottoms or swamps; on the west it is bounded by the bluff marking the high terrace. In places a strip of swamp ranging from several hundred feet to several miles in width lies between the low and the high terrace. The lower terrace has an average width of about 9 miles, and is traversed from north to south by Bayou Teche. The highest land of the low terrace occurs along the banks of this stream, the surface sloping imperceptibly away from the channel on each side. According to the records of the Southern Pacific Railroad, certain elevations along Bayou Teche are as follows: Arnaudville, 27 feet; Breaux Bridge, 26 feet; and St. Martinville, 24 feet. The surface of the low terrace is in general flat, though in detail it is relieved by slight depressions along drainage ways. The lower-lying portions of the low terrace are overflowed in seasons of exceptionally high water, as in 1912.

The first bottoms are far more extensive than the terrace divisions combined, covering approximately five-sevenths of the parish. They occur mainly in the eastern part, and include the detached portion of the parish. There are numerous small areas in the western part. The bottom land, known locally as swamp or cyprière, is swampy, traversed by numerous lakes and a network of distributaries or bayous. Changes are constantly taking place in these streams with the cutting away of banks and the filling in at the heads of the distributaries. The high-water mark on trees in the swamps ranges from a few feet to 12 or 14 feet above the ground.

St. Martin Parish is drained by the Atchafalaya River, Bayou Teche, and Bayou Vermilion. The Atchafalaya River drains about six-sevenths of its area. The high land along Bayou Teche forms the divide between Bayou Vermilion and the Atchafalaya River. There are a number of large lakes in the parish, the most important being Lake Tasse, Lake Rond, and Chicot Lake. The lowest bottoms are covered with water during much of the year.

The first settlement in what is now St. Martin Parish was made between 1750 and 1760 by a colony sent by the Spanish Government from the Canary Islands to engage in the culture of flax and hemp.

This venture proved a failure, and many of the colonists took up grants on Lake Tasse. The earliest land grants date back to 1754. From 1760 to 1765 Acadian (French) exiles from Nova Scotia, Canada, settled along the Bayou Teche. The present population consists largely of the descendants of Acadians and those of negro slaves. French is the common language of the inhabitants, although most of them speak English also. St. Martin Parish was formed in 1807, being then known as Attakapas Parish. Parts of its area were taken in 1823 and 1868 to form Lafayette Parish (including what is now Vermilion Parish and Iberia Parish).

The population of St. Martin Parish in 1910, according to the census, was 23,070, or 43.9 persons to the square mile. Negroes constitute 42.6 per cent of the total population. St. Martinville, with a population of 2,318 in 1910, is the largest town and the parish seat. It is located in a rich agricultural section in the southwestern part of the parish and maintains a number of industrial establishments. Breaux Bridge, with a population of 1,339, is the second largest town. Cades, Arnaudville, Parks, Cecelia, and Atchafalaya are small railroad villages. Throughout the swamp area there are a number of small settlements whose inhabitants are chiefly engaged in lumbering, fishing, hunting, trapping, and gathering moss and honey.

The improved part of St. Martin Parish has good railroad facilities. The Southern Pacific Railroad traverses the southwestern corner of the parish and has two branches, one extending from Cades along the west side of Bayou Teche to Port Barre, in Landry County, and the other known as the Baton Rouge Branch, crossing the parish in a nearly east and west direction, passing through Breaux Bridge and Atchafalaya. The New Iberia & Northern Railroad crosses the parish in a nearly north and south direction along the east side of Bayou Teche. Since the installation by the National Government of locks in the Bayou Teche near Keystone, this stream has been navigable throughout its course in the parish. There are also some navigable streams in the eastern part of the parish.

The parish is well supplied with public roads, all of earth construction. As a rule the main roads are kept in good condition, although in winter they may be impassable in places for short periods. On the heavier soils it is difficult to keep the roads in good repair in rainy seasons. The less traveled roads are not given much attention.

New Orleans affords a good market for farm products. There is also a good local market for eggs, poultry, and dairy products. Rural mail delivery routes and telephone service extend to practi-

cally all the improved localities. In general, the rural schools are modern and well equipped. Practically all of them are now consolidated district schools.

CLIMATE.

Owing to the proximity of the Gulf of Mexico, the climate of St. Martin Parish is comparatively equable. The autumns are long and pleasant; the winters chilly and rainy; the springs mild, with numerous thunderstorms; and the summers hot and humid.

St. Martin Parish is in the same latitude as Lafayette Parish, adjoining, and the data compiled by the Weather Bureau station at Lafayette are indicative of the local climatic conditions. The mean annual temperature as recorded at Lafayette is 67.7° F. For the winter months the mean temperature is 53.3°, and for the summer months 80.9°. The lowest temperature recorded is 6° F. and the highest 107°. The temperature seldom rises as high as 95°. Freezes occasionally occur during the winter, accompanied by northerly winds, but cold spells seldom last longer than three days.

The average date of the last killing frost in the spring is March 4, and that of the first in the fall, November 12. The date of the latest killing frost recorded in the spring is March 30, and that of the earliest in the fall, October 20. The average growing season is 255 days, which is long enough to permit the growing of more than one crop on the same field.

The mean annual precipitation is 53.95 inches. The rainfall is heaviest in the summer and lightest in the fall, averaging 19.24 inches in the former season and 9.78 inches for the latter. The rainfall in the driest year recorded amounted to 37.25 inches, and in the wettest year to 82.02 inches. As a rule the distribution of the rainfall is favorable, and long droughts seldom occur.

Snow is of rare occurrence in St. Martin Parish, and usually melts as it falls. There have been continuous periods of six years with no snowfall. In 1895, however, a fall of about 14 inches occurred in one storm, and traces remained on the ground for five days. Sleet falls occasionally.

The prevailing winds are southerly, and are rarely of high velocity. March and September have the most severe winds, and the region is occasionally visited by destructive hurricanes. The humidity is high, and the heat is more oppressive than in drier regions. There are about 135 clear days and 88 rainy days in an average year.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded by the Weather Bureau station at Lafayette:

Normal monthly, seasonal, and annual temperatures and precipitation at Lafayette, Lafayette Parish.

(Elevation, 36 feet.)

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1902).	Total amount for the wettest year (1905).	Snow, average depth.
	° F.	° F.	° F.	Inches.	Inches.	Inches.	Inches.
December.....	53.1	89	14	4.40	5.02	3.82	0.0
January.....	52.8	89	16	4.14	1.35	5.15	.0
February.....	54.0	87	6	4.56	4.06	10.26	.9
Winter.....	53.3	89	6	13.10	10.43	19.23	.9
March.....	62.2	93	26	3.76	2.57	7.00	.0
April.....	68.1	93	32	3.94	3.41	8.95	.0
May.....	74.4	98	43	4.13	1.98	5.04	.0
Spring.....	68.2	98	26	11.83	7.96	20.99	.0
June.....	79.9	103	53	6.65	2.12	18.52	.0
July.....	81.2	107	60	7.14	2.90	7.31	.0
August.....	81.5	102	53	5.45	2.04	2.09	.0
Summer.....	80.9	107	53	19.24	7.06	27.92	.0
September.....	76.7	100	41	3.47	4.33	5.03	.0
October.....	67.8	96	30	2.86	3.09	3.17	.0
November.....	60.0	90	22	3.45	4.38	5.68	.0
Fall.....	68.2	100	22	9.78	11.80	13.88	.0
Year.....	67.7	107	6	53.95	37.25	82.02	.9

AGRICULTURE.

The lands above overflow originally supported a dense growth of prairie grasses, with strips of timber along the streams. The swamps supported a dense forest growth, and were in places impassable. The first settlers located mainly along Bayou Teche and other streams or bodies of water where there was an abundance of fuel and game. Subsistence crops, including corn, Irish potatoes, sweet potatoes, and garden vegetables, were produced at first, and advancement in agriculture was slow. Hemp and indigo were grown during the early history of the parish, but were later abandoned as unprofitable. Stock raising continued to be an important industry until the prairies were broken up for the production of farm crops.

Cotton and sugar cane were grown as early as 1800 and 1825, respectively, and the production of these staples continued to increase until the Civil War. Cotton was the chief money crop, corn being

grown largely for home consumption. In 1860 cotton, corn, sugar cane, Irish potatoes, and rice were the main crops. Agricultural development was stopped by the Civil War, and it was about 1872 before conditions were readjusted and progress renewed.

According to the census, there were 11,283 acres in corn in 1879, with a production of 211,995 bushels; 6,942 acres in cotton, producing 2,232 bales; 3,525 acres in sugar cane; 451 acres in hay crops; 412 acres in sweet potatoes; 7 acres in rice; and 7 acres in tobacco. By 1889 the area in corn had increased to 16,161 acres, with a production of 289,503 bushels, and the area in cotton to 18,114 acres, producing 6,906 bales. Sugar cane was an important crop, the production amounting to 4,282,500 pounds of sugar and 195,951 gallons of sirup. Cotton and sugar cane were the main cash crops. The area in sweet potatoes had increased to 946 acres and that in hay crops to 902 acres. There was practically no change in the acreage of rice.

In 1893, owing to panic conditions, many sugar plantations suffered heavily and the production of sugar cane was greatly reduced. The 1900 census reported only 5,546 acres in sugar cane, producing 192,130 gallons of sirup. The acreage of cotton was slightly lower than at the preceding census, but the production of corn had greatly increased, this crop having superseded sugar cane to a large extent. The area in rice had increased to 208 acres. The production of hay and forage was larger, 3,171 tons being cut from 2,263 acres. There were 221 acres of cowpeas reported, producing 1,658 bushels.

Another setback was given to agriculture by the advent of the boll weevil in 1904. The acreage of cotton materially decreased. In most instances the crop was temporarily abandoned, but the farmers soon learned to grow cotton profitably under boll-weevil conditions.

The present agriculture of St. Martin Parish consists mainly of the production of corn, sugar cane, cotton, rice, hay and forage, and Irish potatoes in the order named. Farm practices are not uniform throughout the parish. Along the railroads sugar cane is the chief money crop, while in other sections cotton and corn are the principal crops on the lighter textured soils and rice on the heavier soils. Some rice is also produced along Bayou Teche, because of the economy in obtaining water from this stream. The present tendency is to develop a more diversified system of agriculture.

In point of acreage corn is the most important crop in St. Martin Parish. A little over one-third of the improved land is devoted to it, and it is grown on all the improved soil types of the parish. In 1909 there were 37,900 acres in corn, with a production of 780,916 bushels. The average yield is about 21 bushels per acre. A native variety locally known as "Creole" is grown most extensively, but is being superseded by Calhoun Red Top, a variety which yields

better and has a softer grain. The black bug, or corn-ear weevil, and the flying weevil are the worst enemies of corn in the field and are also destructive to mature corn in the ear. For this reason it is advisable to grow a type of corn having an ear tightly and completely covered with the husk, and having a hard grain. The corn-root worm is not a serious pest. Cutworms do serious damage to young corn plants on lands subject to overflow. The greater part of the corn produced in the parish is fed to work stock, some is fed to hogs, cattle, and poultry, and a small part is sold to outside markets in Texas and in New Orleans. About as much corn is imported as exported. Some of the corn is ground into meal for home consumption.

The area in sugar cane has fluctuated considerably in recent years. In 1909 it amounted to 11,365 acres, with a production of 144,799 tons, but at present sugar cane is undoubtedly the second crop in the county in point of acreage. Sugar-cane mills estimate the 1916 production as about 200,000 tons, of which about 31,000 tons were manufactured into sirup. Most of the sirup is sold on northern markets. About 26 gallons of sirup are obtained from 1 ton of cane, and the price ranges from 30 to 40 cents a gallon. The average price received from sugar cane is about \$4 a ton, and the average gross return is about \$50 an acre. The chief varieties of sugar cane grown are the native red or purple, D-74 and D-75. The former is said to be the more prolific and more profitable. The sugar-cane borer is the principal enemy of the cane crop.

Owing to the boll weevil the area in cotton is gradually decreasing. The 1910 census reports 14,699 acres in this crop, with a production of 2,849 bales, as compared with an area of 16,803 acres and a production of 10,572 bales in 1899, before the advent of the boll weevil. Under existing conditions cotton is profitable only when a variety is grown which matures before the weevil does serious damage. The Toole and Simpkins varieties fulfill this requirement and are grown almost exclusively. Cotton is strictly a cash crop, but is exceeded in money value by sugar cane and rice.

Increasing attention is being given the production of rice, especially on the heavier soils. Rice was grown to a small extent in the early history of the parish, but it was not until 1885, after it had been grown successfully on a large scale by means of irrigation in the vicinity of Crowley, Acadia Parish, that much interest was directed to its production. According to the census there were 581 acres of rice, producing 35,942 bushels, in 1909. In 1916 about 4,000 to 5,000 acres were sown. Blue Rose, Honduras, and Japan are the varieties commonly grown. The Louisiana Pearl variety is still in the experimental stage. The sowing of rice usually begins about the 1st of

April. Water, obtained from deep wells and from streams, is put on the land as soon as the plants are a few inches high and kept there until the rice turns yellow, about two weeks before harvesting. The crop is cut, mostly by hand, the latter part of August or early in September; it is handled similarly to wheat and thrashed in the field. Rice is strictly a cash crop, sold directly from the thrashing machine to the mills. A small part of the production supplies the home demand. Red or wild rice is the most troublesome weed in rice fields. Rice is also subject to injury from green or black smut, blast, and brown grain spot.

Oats are grown to a small extent both for pasturage during the winter months and for the grain. Oats are harvested the latter part of May or early in June.

With the apparent adoption of a more diversified system of agriculture, hay and forage crops are becoming more important. These crops do well, but they are not grown extensively enough to supply the local demand. According to the census 2,625 tons of hay and forage were cut from 2,540 acres in 1909. Oats in the sheaf and prairie grasses are the main hay crops. Lespedeza, or Japan clover, grows wild, and does well on all cultivated soils. It could well be more generally grown. In normal seasons it yields 2 to 4 tons per acre in two cuttings. White clover thrives and affords excellent pasturage in early spring.

In the permanent pastures there is some Bermuda grass. This grass grows luxuriantly on the productive, rather damp soils, yielding 2 to 4 tons per acre of hay of good quality. It is the best crop for land subject to overflow. Johnson grass is not very common in St. Martin Parish. Owing to the difficulty of eradicating it in cultivated fields, it is considered undesirable, but it produces a heavy yield of hay and affords good pasturage for one or two seasons. Crab grass is a volunteer plant which generally follows cultivated crops. It affords good pasturage and makes fair hay. Broom sedge is confined to the cleared areas of poorly drained soils. It flourishes especially on the Iberia clay. Early in the season, when the growth is tender, it is relished by stock, but in summer it becomes too hard and woody. The swamps in places furnish switch cane for winter pasturage. Owing to its continual grazing down, however, it is not so plentiful nor so luxuriant as formerly. Wild vetch affords some late winter pasturage in the swamps.

The cowpea is the most important nitrogen-gathering plant grown in St. Martin Parish. It constitutes the principal soil-improving crop. The seed is sown broadcast at the rate of about 1 bushel per acre just before the last cultivation of corn. The corn is snapped and as much of the fodder is gathered as desired, the remainder be-

ing plowed under. For some reason the commonly grown varieties of cowpeas do not bear well, and the seed is purchased from year to year. Different causes are assigned for the failure of the plants to produce seed, but it seems probable that a weevil which attacks the flower is largely responsible. The Clay is the most popular variety, but the Whippoorwill and the New Era are also grown.

In recent years the growing of tabasco peppers and their manufacture into various condiments has become important. About 300 acres are devoted to the production of this crop. Some Cayenne pepper also is grown. The cultivation of these peppers requires much labor, and where the family help is not sufficient to take proper care of the crop it is not profitable. The peppers are hand picked in the fall. As they do not all ripen at once, it is necessary to go over the fields at least three times. The tabasco pepper plant grows to a height of 3 or 4 feet. The pods are about an inch long. The peppers are grown under contract for factories at St. Martinville and New Iberia, and the manufactured products are shipped to different parts of the United States. The gross returns range from \$50 to \$100 an acre. The cost of production is said to be above \$30 an acre.

Not nearly enough Irish potatoes are grown for home consumption. Only 229 acres were devoted to potatoes in 1909, with a production of 12,732 bushels. In the vicinity of Arnaudville some attention has been given to the production of an early variety of potato for shipment to northern markets. As a rule about 75 bushels per acre are obtained.

Almost every farmer grows a small patch of sweet potatoes to supply the home. The crop is grown for sale in only a few places, principally in the vicinity of Arnaudville. Sweet potatoes do fairly well on all the soils, but are best suited to the lighter textured types. For 1909 the census reports 2,842 acres in this crop, with a production of 207,443 bushels. The Pumpkin yam is the most popular variety.

Peanuts do well on the better drained and lighter textured areas of the Olivier silt loam, but the quantity grown in the parish is negligible.

In the vicinity of Arnaudville considerable attention is devoted to the growing of certain truck crops. Cabbage and watermelons are produced on a commercial scale, mainly for the New Orleans market. About 300 acres of cabbage were grown around Arnaudville in 1916, and 35 carloads were shipped. A few farmers near the other towns supply the local demand. Stein's Early Flat Dutch is the variety of cabbage grown. A large proportion of the farmers have gardens, but many of these are too small to supply even

the requirements of the family. A total of 141 acres in miscellaneous vegetables is reported in the census of 1910.

The fruits grown include mainly peaches, pears, plums, figs, and oranges. Peach trees are distributed throughout the parish, but little fruit is produced. Pears succeed if not injured by blight, to which they are very susceptible. Plums thrive, but are grown only to a small extent. Figs do excellently and produce a fruit well suited to the manufacture of preserves. Oranges can be grown, but are not cultivated on a commercial scale. A few farmers have a surplus, for which there is a ready local market. The wild blackberry grows luxuriantly along roadsides and in uncultivated tracts throughout the parish, but little or no attention is given the cultivation of small fruits.

Pecan nuts to the value of \$35,000 were shipped from Breaux Bridge in 1916. The supply comes mostly from trees growing around plantation lots, although the farmers are beginning to set out trees. The grafting of paper-shell pecans on the bitter pecans growing in the swamps has been introduced.

Hogs constitute the greater part of the live stock of the parish. Pork forms the chief meat diet of the farmers, very little beef being consumed on the farms. Some hogs are shipped out of the parish, but large quantities of pork products are imported. In the swamps the hogs feed largely on acorns and bitter pecans, which are very abundant. Poland-China, Duroc-Jersey, and Berkshire are the principal breeds of hogs. Comparatively few of the animals are pure bred. The census reports 5,201 hogs sold or slaughtered in the parish in 1909. Hog cholera is a serious drawback to the raising of hogs. The extensive swamps throughout the parish are largely used as ranges for beef cattle. The census reports 207 calves and 1,191 other cattle sold or slaughtered in 1909. There are a few small flocks of sheep in the parish.

Nearly every farmer keeps one or two milch cows, in addition to young stock. Butter is usually made by hand. The dairy products made on the farm are generally insufficient to supply the home needs. As a rule no attention is given to sanitary methods of handling milk and stock, or to the feeding of balanced rations. On some farms the dairy stock is left to shift for itself on the open range, and during the winter losses are common. Anthrax is prevalent and under the methods of handling cattle difficult to control. The Texas-fever tick, which is still prevalent, is a serious menace, especially to imported stock. Most of the cattle are of nondescript breeding, generally with some Jersey blood. There are a few registered Jersey cattle.

Nearly every farmer raises 50 to 100 chickens and relatively large numbers of other fowls, including ducks, geese, and guineas. The

value of all poultry and eggs produced in 1909 is reported by the census as \$109,357.

A few light horses and "cotton" mules are raised in the parish, but most of the work stock is imported. Mules do most of the farm work.

It is recognized by the farmers that sugar cane, Irish potatoes, sweet potatoes, peppers, and vegetables do best on the well-drained, light-textured soils, and rice on the heavier types. Most of the sugar cane is grown on the Olivier and Lintonia soils. The crop also yields well on the Iberia silt loam and silty clay loam. Distance from railroads has to a large extent determined the kinds of crops grown. Cotton is usually grown on land at some distance from railroads, the more accessible land being devoted to sugar cane. Rice culture is confined chiefly to the Iberia clay.

As a whole the farm improvements in St. Martin Parish are above the average for the State of Louisiana. On farms operated by owners the buildings are usually well kept and comfortable. Most farms are fenced with barbed wire, but on the better farms woven wire is being adopted. The Cherokee rose is used to a considerable extent, and the Osage orange in a few places, for hedges. Most farmsteads have a grove of chinaberry trees, live oak, and pecans.

The principal types of farm machinery in use are one and two horse walking plows, middle busters, cultivators, disk harrows, mowing machines, corn planters, spike-tooth and spring-tooth harrows, stubble shavers, stubble diggers, and stalk cutters. On the larger plantations a few tractors are used to operate gang plows. The tendency is toward the use of heavier mules and better machinery, especially on the larger farms and plantations. The one-horse plow is not used as much as formerly. As a rule the farm machinery is well cared for, being housed on the large plantations.

Ridge cultivation is general except in the production of rice. For sugar cane ridges 6 feet apart from center to center are prepared with a turning plow. At planting time the beds are opened with a double-moldboard plow and a double row of seed cane laid in each furrow. The seed stalks are then covered and rolled, being buried about 3 or 3½ inches deep when the operation is completed. Two crops are obtained from the one planting, the second year's crop growing from the stubble of the first year. The old stubble fields are "barred off" and a "shaver" is run over the foot-wide remaining strip, leaving the live ends of the stubble flush with the surface. A stubble digger is then used to loosen the soil and hasten the growth of the sprouts. The planted cane is also "barred off" with a plow which throws the soil away from the bed on both sides until a strip about 1 foot wide remains. The soil is then scraped off the ridge to

within $1\frac{1}{2}$ inches of the seed in order to hasten the growth. On the most successful farms sugar cane is cultivated about every tenth day until the plants are too high to cultivate, which is usually the case late in July. In the first cultivation the soil is thrown away from the rows, but as soon as the plants are several inches tall it is worked back. The final cultivation consists of turning the soil against the row with a turning plow. In addition the crop is given several hoeings. Harvesting begins the middle of October and sometimes lasts until the end of December. The discarded tops of the cane are burned in the field.

For corn the seed bed is prepared in the same way as for sugar cane, and the seed is planted with a drill or by hand. In rice culture the land is first leveled and then plowed about 12 inches deep. Before the seed is drilled in the soil is disked and harrowed twice.

In growing cotton most of the farmers break their fields in lands with a two-horse plow, lay them off in furrows 40 to 48 inches apart, and bed into low, flat rows on these furrows as a center with a one-horse plow or turning shovel. These beds are thoroughly harrowed, after which seeding is done with a one-horse planter. As soon as the cotton plants are up, or sooner if the soil is crusted or packed from heavy rains, a V-shaped or a spring-toothed cultivating harrow is run on both sides of the drill, breaking the crust and killing all small weeds and grass. When the plants are large enough the cotton is cultivated with a short shovel and a small sweep. The plants are then chopped to a stand a hoe's width apart. The crop is cultivated four to six times or more according to the season, spring-toothed cultivators and different-sized sweeps being used. An additional thinning and hoeing is given in exceptional years.

Tabasco peppers receive very thorough cultivation. The plants are transplanted from hotbeds about the 1st of March, in rows about 15 inches apart. The soil is turned over by very shallow cultivation about twice a month for two months. In addition, several hand hoeings must be given to keep down weeds.

Various crop rotations are practiced in different parts of the parish. Where sugar cane is the predominant crop it is usually grown for 2 years, followed by corn for 2 years. Cowpeas are usually sown in cornfields at the last cultivation, and plowed under as green manure. Rice is generally grown for 3 successive years, followed either by pasture for 2 years or by corn 1 year and cotton 1 year. It is necessary to rotate other crops with rice in order to destroy certain weeds that take possession of the fields where rice is grown continuously. Where corn is a money crop, particularly on the heavier soil types, it is grown for a number of years in succession.

The census reported an expenditure of \$10,255 for commercial fertilizers in 1909, averaging \$43.09 for each of the 238 farms report-

ing an outlay. Commercial mixtures are chiefly used on sugar cane, corn, and cotton. On small farms very little is used. Acid phosphates and cottonseed meal are the principal fertilizer ingredients, but owing to the increased demand for the latter, which is coming more and more to be used as a stock feed, this mixture has been temporarily abandoned. Considerable green manure and some barnyard manure are used. Cowpeas are the principal green-manure crop.

It is difficult to obtain efficient farm laborers in this parish. On the large plantations the laborers are mostly negroes, though there are a few Italians. On the smaller farms most of the work is done by the farmers and their families. Laborers are usually hired by the day, being paid \$1.25 to \$1.50, without board, during the harvesting season, and 75 cents at other times. In 1909, 460 farms used hired labor, at a total cost of \$158,447.

There were 118,608 acres in farms in St. Martin Parish in 1909, according to the census, of which 87,414 acres were improved. The average size of farms is given as 52.9 acres.¹ There are a number of large land holdings, one of which comprises 13,000 acres, or about one-seventh of the tillable land in the parish. The total number of farms is 2,239, of which 55.2 per cent are operated by tenants, 44.4 per cent by owners, and 0.4 per cent by managers. Both the cash and share tenant systems are followed. In share renting, which is the more popular, the owner receives one-fourth to one-third of the crops, depending upon the proportion of the cost of production borne by him. Cash rentals vary from \$2 to \$6 an acre, depending upon the nature of the soil and the improvements.

The price of land in St. Martin Parish ranges from \$1 to \$75 an acre, the price depending mainly upon the soil, improvements, and location. In 1910 the census gave the average assessed value of land as \$35.19 an acre, an increase of \$19.11 over the value given for 1900. The total value of all property per farm in 1909 was \$2,769, of which 67.3 per cent was represented by the land, 15.7 per cent by buildings, 3.3 per cent by implements and machinery, and 13.8 per cent by domestic animals.

SOILS.

The soils of St. Martin Parish are all of alluvial origin. About 70 per cent of the parish is occupied by the first bottoms of the Mississippi River, about 28 per cent by low terraces or second bottoms, and about 2 per cent by high terraces, or third bottoms. In the first bottoms the Sharkey clay is the predominant soil type. Small areas of Sharkey silty clay loam occur along the outer margin of the swamp,

¹The census tabulates each "tenancy" as a farm.

and the Sharkey and Portland very fine sandy loams are developed immediately along the banks of the Atchafalaya River and its numerous distributaries and old abandoned channels.

West of this extensive swamp or first-bottom land is the low terrace, occupied by the low phase of the Olivier silt loam and by soils of the Iberia series. Along the bayous which pass through it there are some narrow strips of Portland soils. The low terrace stands from 10 to 15 feet above the general level of the Atchafalaya swamps, and is subject to overflow only along the margin, and there only when breaks occur in the Mississippi River levees.

To the west of the low-terrace area is the high terrace or third bottom, separated from the low terrace by a sharp slope or bluff from 15 to 30 feet in height. This upland or high terrace is occupied by the Olivier and Lintonia soils.

All the various soils are composed of sediments derived from the different soils occurring in the drainage basins of the Mississippi River and its tributaries. The peculiar chocolate-red color of the material (Portland material) seen along the banks of the streams is caused by sediments washed from the Red Beds region of western Texas and Oklahoma and deposited by the Red River, which at high-water stages enters the Atchafalaya. The high-terrace soils are believed to have been deposited over flood plains that existed during a former stage in the development of the Mississippi River alluvial plains. The better-drained soils of the parish—those standing above overflow and not having impervious substrata—are better oxidized and browner, with less gray mottling in the subsoil.

Excluding Peat, 11 soil types and 2 phases, representing 6 series, are mapped in St. Martin Parish.

The Lintonia series includes brown soils with moderately friable, yellowish-brown subsoils. The material represents old alluvium of the Mississippi River terraces. The drainage is sufficiently well established to cause the subsoil to have a uniform color. In St. Martin Parish the Lintonia series is represented by only one type, the silt loam.

The Olivier series includes types having grayish-brown soils and light-gray or drab subsoils, mottled with yellow and frequently containing black and brown concretions. These soils are derived from the old terrace alluvium of the Mississippi River. Two types, the silt loam and silty clay loam, with a low phase of the former, are mapped in St. Martin Parish.

The types included in the Iberia series have dark-brown to black soils and heavy clay subsoils, mottled dark brown and yellowish or black and brownish. These soils are confined to the low terrace and are rather poorly drained. Three types, the silt loam, silty clay loam, and clay, are mapped in St. Martin Parish.

The soils of the Portland series are brown, with salmon-colored or chocolate-red subsoils. The reddish color of the subsoil is due to material deposited by the Red River. The Portland very fine sandy loam and silt loam are mapped in this parish.

The Sharkey series includes types having drab or mottled drab and brownish soils, and bluish-gray subsoils conspicuously mottled with yellow and rusty brown. These soils occur in the first bottoms and are subject to overflow. The Sharkey silty clay loam and clay, with a better drained phase of the latter, are mapped in St. Martin Parish.

In the Wabash series are grouped types with dark-brown to black soils and black subsoils. The material is derived from adjacent old alluvial soils—the Lintonia and Olivier silt loams. Only one type of this series, the Wabash silty clay loam, is mapped in this survey.

In the southwestern part of the parish, bordering the swamps, several areas of Peat are mapped.

In the following chapters the several soil types are described in detail and their relation to the agriculture of the parish discussed. The actual and relative extent of the different soils is given in the following table:

Areas of different soils.

Soil.	Aeres.	Per cent.	Soil.	Aeres.	Per cent.
Sharkey clay.....	316,800	71.8	Sharkey silty clay loam.....	4,864	1.1
Better drained phase.....	1,216		Lintonia silt loam.....	4,480	1.0
Iberia clay.....	38,592	8.7	Portland very fine sandy loam...	4,096	0.9
Olivier silt loam.....	3,264	6.9	Peat.....	2,176	0.5
Low phase.....	27,456		Portland silt loam.....	704	0.2
Iberia silt loam.....	15,808	3.6	Wabash silty clay loam.....	512	0.1
Olivier silty clay loam.....	12,224	2.8			
Iberia silty clay loam.....	10,688	2.4	Total.....	442,880	

LINTONIA SILT LOAM.

The Lintonia silt loam consists of a brown, mellow silt loam, 8 to 12 inches deep, underlain by a light-brown or yellowish-brown silty clay, which locally may have a reddish cast. The subsoil is somewhat compact, but crumbles readily between the fingers. Below 26 to 30 inches the subsoil is frequently a yellowish-brown silty clay loam, while, as seen in road cuts, the substratum, below depths of 40 to 50 inches is a friable, yellowish-brown silt loam. In places the lower subsoil shows faint mottlings of gray. It is more or less compact, though friable. The color of the surface soil varies from light brown in the more undulating areas to dark brown in flatter, less well-drained areas. The soil is rich in organic matter, and is acid according to the litmus-paper test. The subsoil does not seem

to be quite so light in color or so heavy as that of the Richland silt loam, a somewhat similar soil mapped in the northern part of the State.

As a whole the Lintonia silt loam is remarkably uniform. Along the bluff, where erosion has been rather active, the subsoil has been exposed in places, and has given rise to a yellowish-brown silty clay loam soil (Lintonia silty clay loam) in areas which are too small and patchy to be shown on the map. The Lintonia silt loam differs from the Olivier silt loam in having a subsoil with a solid yellowish-brown color instead of a gray or drab subsoil mottled with yellowish brown. Areas of Olivier silt loam too small to map are included with the Lintonia.

This type has an area of about 7 square miles. It occurs in the southwestern part of the parish on the high terrace or third bottoms, where it is associated with the Olivier silt loam. The surface is predominantly flat. Except along the margin of the bluff, the stream channels are shallow and the slopes very gentle. In general the type is well drained, though local "sags" and depressions occur in which artificial drainage is needed.

The Lintonia silt loam is a prairie soil, and practically all of it, except narrow, forested strips along drainage ways, was originally covered with a thick growth of prairie grasses. Approximately 95 per cent of the type is under cultivation. It is the best sugar-cane soil in the parish, and over one-half of it is devoted to this crop, the remainder being largely in corn. Small fields of cotton are planted. Sugar cane yields ordinarily from 12 to 20 tons per acre, but with proper fertilization and thorough cultivation much higher yields are obtained. Corn yields 20 to 30 bushels, and cotton about one-third bale per acre. Lespedeza does well, but only a small acreage is devoted to it. Nearly every farmer on this type grows enough sweet potatoes to supply home needs.

This soil works up into an excellent tilth, and it can be cultivated under a wide range of moisture conditions. Even if cultivated while wet it clods but little. Owing to its high content of organic matter and friable, silty texture, it withstands drought well, provided proper steps are taken to conserve the moisture in the soil. Only small quantities of barnyard manure and commercial fertilizer are used on this soil.

Land of this type of soil is held at \$50 to \$75 an acre, the price depending upon the location and improvements and the condition of the soil in any particular tract.

In experiments carried on by the Industrial School at Lafayette an acreage application of 200 to 300 pounds of acid phosphate and about 100 pounds of cottonseed meal gave very good results with

corn and cotton, but no increase in yield resulted from the application of potash fertilizers. Nitrogen is advantageously supplied by introducing cowpeas and velvet beans in crop rotations. Owing to the acid condition of the soil a liberal application of lime would likely prove beneficial.

OLIVIER SILT LOAM.

The Olivier silt loam consists of a layer of brown silt loam becoming somewhat lighter in color with depth and underlain at 8 to 12 inches by yellowish-brown or brownish-yellow silty clay. This passes below into yellowish silty clay, faintly mottled with brown and gray. The lower subsoil is rather compact and usually mottled yellow, yellowish brown, or rusty brown, and gray or bluish gray. In places there is a subsurface layer, 3 or 4 inches thick, of light-gray silt loam, with some rusty-brown mottlings. In some places the upper subsoil is a mottled yellowish brown and bluish gray, and again the color, particularly of the lower subsoil, may be light yellow. Small black concretions are as a rule fairly abundant, and in places very abundant, throughout the 3-foot section. Both soil and subsoil are acid, according to the litmus-paper test. The soil is apparently not so high in organic matter as the Lintonia silt loam.

The Olivier silt loam occurs in association with the Lintonia silt loam on the high terrace in the southwestern part of the parish. It covers approximately 7 square miles and extends into Iberia Parish, where it is extensively developed. The boundary line between the two types is not sharp, as there is not everywhere a distinct topographic change from one to the other. As a rule, however, the Olivier silt loam occupies more nearly level and more depressed positions. The topography is prevailingly flat, but is relieved by slight depressions, shallow stream channels, swales, and draws. The surface drainage is apparently good, although with heavy rains it takes some time for the water to run off. Underdrainage is poor. Many shallow ditches have been constructed to remove the surface water, but experience indicates that a system comprising both open ditches and tile is necessary for the best results.

Most of this type originally was covered with a thick growth of prairie grasses. At present about 90 per cent of it is under cultivation. Sugar cane, corn, and cotton are the principal crops. Sugar cane does not do quite so well as on the Lintonia silt loam, yielding ordinarily from 12 to 15 tons per acre. Corn yields 20 to 25 bushels and cotton from one-fourth to one-third bale per acre. Lespedeza does very well, but is not extensively grown. As a rule only enough sweet potatoes are produced to supply the home needs. The yield ranges from 40 to 60 bushels per acre.

This type can be cultivated under a wide range of moisture conditions. As a rule only small quantities of manure and commercial fertilizer are applied.

The price of farm land of the Olivier silt loam ranges from \$40 to \$60 an acre.

The suggestions given for the improvement of the Lintonia silt loam apply also to this type. Artificial drainage and, for most crops, liming are necessary for best results.

Olivier silt loam, low phase.—The Olivier silt loam, low phase, consists of a brown silt loam passing at 10 to 15 inches into a mottled yellowish-brown or brownish-yellow and grayish-brown silty clay. In places the subsoil is mottled yellow and bluish gray. As a rule the upper part of the subsoil is compact and the lower part moderately friable. Both soil and subsoil are acid, according to the litmus test, although in places lime concretions occur in the substratum below 40 inches. The phase has none of the black concretions that characterize the typical soil.

Included with this phase are some small areas of Olivier very fine sandy loam and patches in which the lower subsoil is a grayish-yellow very fine sandy loam. There are also included some imperfectly drained, low areas in which the soil is darker than usual, approaching in character the Iberia silty clay loam.

The Olivier silt loam, low phase, is extensively developed on the low terrace above the first-bottom swamp of the Atchafalaya River on the east. It covers about 35 square miles. The type is intricately associated with the Olivier silty clay loam and soils of the Iberia series. The largest areas occur as strips along Bayou Teche. While the phase always occupies the higher parts of the low terrace, the topography is predominantly flat. The surface is fairly well drained, but the subsoil is poorly drained and lacks proper aeration.

Most of this phase was originally covered with a luxuriant growth of prairie grasses. About 95 per cent of it is under cultivation. The same crops are grown as on the typical soil, and in addition small fields of rice. The yields are somewhat larger than on the typical soil.

The price of land of the Olivier silt loam, low phase, ranges from \$35 to \$70 an acre, the higher prices obtaining for well-improved farms lying convenient to towns or shipping points.

OLIVIER SILTY CLAY LOAM.

The Olivier silty clay loam consists of a brown silty clay loam, 6 to 10 inches deep, underlain by yellowish-brown or brownish-yellow silty clay which passes into a plastic silty clay, mottled with yel-

lowish brown and bluish gray. The lower subsoil is a little more compact and impervious than the upper subsoil. Occasionally the subsoil contains a few small, black concretions. Both soil and subsoil are acid according to litmus-paper tests.

This type has an aggregate extent of about 20 square miles. It occurs in numerous small areas on the low terrace. It lies slightly lower than the Olivier silt loam, frequently between that type and the Iberia soils. The topography is generally flat or depressed. Surface drainage is fairly well established, but the underdrainage is rather poor.

Most of this type was originally covered with prairie grasses. Nearly all of it is now under cultivation, being used chiefly in the production of sugar cane, corn, cotton, and rice. In favorable years sugar cane yields 12 to 15 tons per acre. Corn yields ordinarily about 20 bushels, cotton one-fourth to one-third bale, and rice 30 to 60 bushels per acre. As a rule enough sweet potatoes are produced to supply the home demand.

This soil is more difficult to handle than the Olivier silt loam, and if worked when too wet it forms clods. Only small quantities of commercial fertilizer and barnyard manure are used.

Land of the Olivier silty clay loam type is held at \$30 to \$40 an acre.

The suggestions made for improving the Olivier silt loam are also applicable to this type. The installation of drainage systems is probably necessary for the best results.

In the following table are given the results of the mechanical analyses of samples of the soil and subsoil of the Olivier silty clay loam:

Mechanical analyses of Olivier silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
432024.....	Soil.....	0.2	1.2	1.0	3.0	4.2	65.4	25.1
432025.....	Subsoil.....	.0	.4	1.1	5.0	2.2	40.5	50.7

IBERIA SILT LOAM.

The soil of the Iberia silt loam is a dark-brown to almost black, mellow silt loam, ranging in depth from 6 to 15 inches. The subsoil consists of a dark bluish gray silty clay, mottled with yellowish brown, underlain at about 20 inches by lighter textured, bluish-gray or gray material, thickly mottled with bright yellow or reddish yellow. The subsoil is rather plastic in the upper part, but becomes less plastic with depth and is moderately friable in the third foot.

Black concretions occur in the subsoil. The soil is rather high in organic matter.

About 24 square miles of this soil are mapped in St. Martin Parish. It occurs in small areas throughout the low-terrace section of the parish and lies 5 to 10 feet above the level of the swamps. The surface is flat, but in general the drainage is good.

The type was originally covered with a luxuriant growth of prairie grasses. Practically all of it is now under cultivation, largely to sugar cane, corn, and cotton. Rice is grown to a small extent. The soil is suited to the production of lespedeza, bur clover, cow-peas, and vetch. Sugar cane yields ordinarily 16 to 20 tons, corn 20 to 30 bushels, and cotton one-third bale per acre.

Owing to its silty texture, the Iberia silt loam can be handled under a rather wide range of moisture conditions. Only small applications of barnyard manure and cotton seed and scarcely any commercial fertilizer are used on it.

The price of land of this type ranges from \$40 to \$50 an acre, depending largely on the improvements.

The Iberia silt loam is a strong soil, and only in fields that have been devoted to the same crops for a period of years has it declined materially in productiveness. Owing to the high content of organic matter, it is not necessary to grow leguminous crops as often as on the Olivier silt loam. As a rule more thorough cultivation would be beneficial. Thorough drainage is necessary in order to obtain maximum yields.

IBERIA SILTY CLAY LOAM.

The Iberia silty clay loam consists of a dark-brown to black silty clay loam, passing at an average depth of about 10 inches through a brownish silty clay into a mottled yellowish-gray, yellowish-brown, or rusty-brown and bluish-gray, plastic, sticky silty clay. The surface soil is heavier and more compact in the lower than in the upper part. It is sticky when wet, but crumbles on drying. Lime concretions occur in places, but are not so abundant as in the Iberia clay. As the color indicates, the soil has a high content of organic matter. The soil and subsoil are neutral or nearly neutral to litmus.

This type is comparatively inextensive. It occurs in small areas throughout the low-terrace region of the parish. The topography is flat to depressed, and drainage is imperfect. Owing to its high content of organic matter and heavy texture, the soil rarely suffers from drought if properly handled.

Practically all of this type originally was covered with water-loving prairie grasses and sedges. Approximately 95 per cent of it is now under cultivation, being devoted largely to the production of

corn, sugar cane, cotton, and rice. Corn ordinarily yields 25 to 30 bushels, sugar cane 15 to 20 tons, and cotton one-fourth to one-half bale per acre. Some rice is grown, and with proper cultivation 40 to 50 bushels per acre are obtained. The soil is too heavy for good results with sweet potatoes. Irish potatoes do fairly well.

The Iberia silty clay loam is difficult to handle, mainly on account of its imperfect drainage. If cultivated too wet it forms clods which are difficult to reduce, but under favorable moisture conditions it works into a rather mellow seed bed. Scarcely any barnyard manure and no commercial fertilizer are used.

The price of land of the Iberia silty clay loam type ranges from \$30 to \$40 an acre.

The establishment of a drainage system with tile drains laid 3 or 4 rods apart is necessary to put the areas of this type in good condition for cropping.

In the following table are given the results of the mechanical analyses of samples of the soil and subsoil of the Iberia silty clay loam:

Mechanical analyses of Iberia silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
432003.....	Soil.....	0.1	0.2	0.3	3.2	10.2	62.1	23.9
432004.....	Subsoil.....	.1	.4	1.4	5.6	6.2	58.0	28.1

IBERIA CLAY.

The Iberia clay consists of a black, waxy clay, 8 to 18 inches deep, overlying a pale yellowish brown sticky, plastic clay which in many places has a slightly greenish cast and contains small whitish lime concretions. The subsoil becomes lighter in color with depth, frequently changing in the lower part to bluish gray. The change from soil to subsoil is gradual. In places the transitional zone is a drab clay, usually mottled conspicuously with yellowish brown and sometimes with reddish brown or rusty brown. There are a few dark-colored concretions in the subsoil. The clay does not effervesce with hydrochloric acid and is neutral to litmus paper, but the lime concretions effervesce freely. A high percentage of organic matter gives the soil its characteristic dark color. The Iberia clay is locally referred to as "terre gras" and "blackjack land," the latter term not referring, however, to blackjack trees, as the soil is a prairie type.

The Iberia clay is the second most extensive type in the parish, occupying approximately 60 square miles. It is confined to the low terraces, and is never overflowed, except along the margin during

abnormal floods of the Mississippi River. The topography is nearly level and drainage is imperfect. The native vegetation consists of prairie grasses, including broom sedge and "paille prairie," with timber along the margins of the areas.

This is one of the best rice soils in the parish, and an estimated area of about 6,000 acres at present is devoted to this crop. Approximately 40 per cent of the type is now used solely for pasture, but the cultivated area is being rapidly extended. With proper cultural methods rice yields 35 to 50 bushels per acre. Where artificial drainage is provided corn yields 25 to 35 bushels per acre. Owing to the luxuriant late growth of cotton, a greater loss is caused by the boll weevil than on the lighter textured soils. Lespedeza, sweet clover, and cowpeas succeed on this type. Only small marginal areas are devoted to the production of sugar cane.

If this soil is worked when the moisture conditions are favorable a good seed bed is readily obtained, but if worked when too wet it forms intractable clods. No fertilizers are used on this type.

Land of the Iberia clay is held at \$20 to \$30 an acre, the price depending mainly on the drainage conditions.

The Iberia clay is naturally a strong, durable soil, and does not require fertilization. Lime sulphate has been successfully used to increase its friability. Improvement of the drainage is the greatest need of the type.

The results of the mechanical analyses of samples of the soil and subsoil of the Iberia clay are given in the following table:

Mechanical analyses of Iberia clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
432015.....	Soil.....	0.2	1.1	2.6	11.8	11.3	38.0	34.6
432016.....	Subsoil.....	.0	.4	1.8	8.3	8.5	38.8	42.1

PORTLAND VERY FINE SANDY LOAM.

The Portland very fine sandy loam consists of a light-brown very fine sandy loam, underlain at any depth from 4 to 15 inches by a salmon-red to light chocolate red, rather tough silty clay. In some of the more poorly drained areas the surface soil is dark brown. In other poorly drained situations and in areas adjoining the Olivier soils the subsoil is mottled red, gray, or bluish gray. There are numerous spots, especially along Bayou Teche, in which the surface soil has been removed by erosion, leaving the red clay exposed. Along the banks of Bayou Teche the lower subsoil consists of a reddish very fine sandy loam. Small areas of Portland silt loam and

silty clay loam and of soil that appears to be transitional between Portland and Olivier material are included, with this type as mapped. The surface soil is relatively low in organic matter, and, as shown by the litmus test, is acid.

The Portland very fine sandy loam occupies marginal positions on the low terrace and first bottoms. On the low terrace it occurs in a narrow strip along Bayou Teche and Catahoula Coulée, while on the first bottom it occurs in narrow strips along Vermilion Bayou and the lakes and distributaries of the Atchafalaya River in the Atchafalaya Swamp. About 6 square miles of the type are mapped in St. Martin Parish. The narrow strips along the Atchafalaya River and its distributaries are not mapped, on account of their irregular distribution, inaccessibility, and lack of present agricultural importance.

This type was originally forested, but a large part of it is now cleared. Approximately 30 per cent of it along Bayou Teche is used for agriculture. The area along Vermilion Bayou is also farmed, although subject to occasional overflow. The areas in the Atchafalaya swamps are not used, as they are flooded annually. Sugar cane, corn, cotton, sweet potatoes, Irish potatoes, and cabbage and other vegetables are the principal crops. Sugar cane yields 12 to 15 tons, corn 15 to 25 bushels, cotton one-fourth to one-half bale, and sweet potatoes about 100 bushels per acre. The soil is also well suited to the production of peanuts, tomatoes, and melons.

The price of land of the Portland very fine sandy loam ranges from \$40 to \$50 an acre on the low terrace, from \$15 to \$30 along Bayou Vermilion, and from \$1 to \$5 in the Atchafalaya swamps.

This type can be improved by growing and plowing under green manures, especially leguminous crops.

PORTLAND SILT LOAM.

The Portland silt loam consists of a brown silt loam, underlain at 8 to 12 inches either by a compact, tough, salmon-red clay or by a brownish silty clay passing into salmon-red or chocolate-red silty clay, mottled somewhat with gray or bluish gray. In the less well drained situations and in areas adjoining the Olivier series the subsoil is mottled red, gray, or bluish gray. In numerous spots the surface soil has been removed by erosion and the red clay is exposed. The surface soil is relatively low in organic matter, and acid. Areas of Portland very fine sandy loam and Yahola silt loam too small to indicate on the map are included with this type.

The Portland silt loam is confined to two narrow strips, one on each side of Bayou Teche in the southern part of the parish. It occupies the front land, and is high and thoroughly drained.

The original forest growth on this soil has been largely removed, and a large part of the type is in cultivated fields. The principal crops grown are sugar cane, corn, and cotton. Carolina vetch grows wild in luxuriance.

Land of the Portland silt loam is held at \$40 to \$50 an acre, the price depending upon the improvements and location.

The methods suggested for improving the Olivier silt loam are also applicable to this type.

In the following table are given the results of mechanical analyses of samples of the soil and subsoil of the Portland silt loam:

Mechanical analyses of Portland silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
432007.....	Soil.....	0.0	0.2	0.3	1.8	6.6	66.3	25.0
432008.....	Subsoil.....	.0	.1	2	.8	6.2	52.0	40.7

WABASH SILTY CLAY LOAM.

The Wabash silty clay loam consists of a dark-brown to black silty clay loam, underlain by a jet-black, plastic silty clay. Both soil and subsoil are noncalcareous. In places the surface soil is brownish and the subsoil is mottled brown and rusty brown in the upper part, becoming black in the lower part. Some small areas of Wabash silt loam, in which the surface soil is mottled brown and rusty brown, are included with this type as mapped.

The Wabash silty clay loam is very inextensive. It occurs in the first bottoms along the smaller streams in the upland or high-terrace section. The topography is flat and the drainage poor. Overflows sometimes occur after heavy rains, but they are of short duration. Most of this type is forested with willow, cypress, oak, and gum, and used for pasture. None of it is cultivated.

SHARKEY SILTY CLAY LOAM.

The Sharkey silty clay loam consists of a dark bluish gray or mottled bluish-gray and rusty-brown silty clay loam, underlain at 6 to 8 inches by a sticky, plastic, bluish-gray or dark bluish gray silty clay, mottled with yellow or rusty brown, and becoming lighter in color with increase in depth. The dark color of the immediate surface soil is due to the large content of vegetable matter. Lime concretions are present in the subsoil in places.

The Sharkey silty clay loam is inextensive, the areas mapped aggregating only 7.5 square miles. It occurs mainly along the mar-

gins of the Atchafalaya swamps, with a small area at Bayou Chene, and another west of the Bayou Teche in the northwestern part of the parish. Some areas in the Atchafalaya Swamp undoubtedly were not mapped. The type is subject to annual overflows. The surface is level and drainage is poor, although better than on the somewhat lower lying Sharkey clay. The forest growth on this type is similar to that on the Sharkey clay. The land is used largely as a range for cattle and hogs. A few small areas are devoted to the production of corn.

The price of land of this type ranges from \$5 to \$15 an acre.

SHARKEY CLAY.

The Sharkey clay consists of a mottled dark bluish gray and rusty-brown silty clay, changing at 5 or 6 inches into a mottled bluish-gray and rusty-brown, sticky, plastic silty clay, which usually becomes lighter in color with increase in depth. In some places bluish gray and in others brown is the predominant color in the subsoil. The soil has a characteristic granular structure when dry. Lime concretions are present in the subsoil in places.

Included with this type as mapped are narrow strips of Portland very fine sandy loam and Sharkey silty clay loam, very fine sandy loam, and fine sand. The sandy soils are readily recognized by their characteristic growth of "willow brakes."

The Sharkey clay is the most extensive bottom-land type in the parish, covering about 500 square miles. It is developed mainly in a single large area in the Atchafalaya swamps in the eastern part of the parish, with relatively small areas in the western part. The surface is level or depressed, and is interrupted by low ridges, sloughs, and cypress brakes. The land is poorly drained and subject to deep and protracted inundations.

Most of this type supports a forest growth consisting chiefly of cypress, sweet gum, maple, willow, ash, hackberry, bitter pecan, tupelo, sycamore, elm, red haw, swamp white oak, willow oak, and live oak. Honey locust and persimmon are present in places. Spanish moss and mistletoe are very abundant on the oaks and cypress. The swamp is locally referred to as *cyprière* (cypress land). Much of the merchantable timber has been removed, but lumbering continues to be the chief occupation. The gathering of Spanish moss for sale, and fishing, trapping, and the raising of hogs, cattle, and goats are the industries of second importance. The stock readily fattens on the nuts, acorns, and grass of the swamps. A few small, higher lying areas are used for growing corn and cotton.

Land of this type usually ranges in price from \$1 to \$10 an acre. Areas having a heavy stand of merchantable timber are worth more.

Sharkey clay, better drained phase.—The better drained phase of the Sharkey clay includes comparatively high ground occurring as

natural levees immediately along the banks of some of the streams of the great swamp-land area in the eastern part of the parish. It is associated with the typical wet Sharkey clay, and represents narrow strips, rarely one-fourth of a mile wide, which stand, in the highest places, not more than 6 or 8 feet above the typical soil. The highest positions are nearest the banks of the streams, the surface sloping rapidly away from the banks to the level of the typical soil. It is all subject to overflow, but dries out between overflow periods much more completely than the typical soil, in fact sufficiently to be farmed.

The soil has more brown in it than the typical soil and less gray mottling, but the lower subsoil is usually like that of the typical, though it, also, may not show so much gray coloring. Representative borings show this phase to consist of brown silty clay, usually slightly mottled with rusty brown, grading at depths of 3 to 6 inches into lighter brown plastic silty clay mottled with rusty brown and gray or dark bluish gray. The gray mottling increases with depth, until it equals or exceeds the mottling of rusty brown. In places there is also considerable yellowish-brown mottling in the subsoil. The subsoil is uniform in texture and structure throughout the 3-foot section consisting of plastic silty clay. On drying the surface crumbles and for this reason is known locally as "buckshot" land.

The areas seen occur along Belle River, Bayou Long, and Bayou Milhomme in the detached portion of the parish. A number of people live on these strips of high ground, and there are some saw-mill camps located on it in which a considerable number of families live. There are cleared areas on which corn and vegetables are grown. The fields are usually small often mere garden patches, but a few contain perhaps 10 or 15 acres or more. The soil is very productive.

Nearly all the people on this soil outside the lumber camps raise hogs and cattle. The cattle find good grazing in the swamps, and also feed upon the water hyacinths ("water lilies") which in many places cover the streams, constituting an obstacle to navigation. The hogs find an abundance of feed in the swamps.

In time of very high water the residents in this swamp country are sometimes forced to resort to boats or barges for safety.

On this phase of the Sharkey clay the principal vegetation consists of honey locust, red haw, oak, vines, and carpet grass.

There are some areas which are not shown on the map, but these are not extensive. Some high areas occur back from the streams and are known as "ridges," but they, too, are probably not extensive. These "ridges" probably represent old natural levees which were built along streams now filled in. Such areas have been included on the map with the typical Sharkey clay.

PEAT.

The material mapped as Peat consists of brown, fibrous, or felty, partially decomposed vegetable matter, ranging in depth from a few inches to 3 feet or more. Usually it contains a layer of mucky clay, which is black in the upper part and bluish or mottled blue and drab in the lower part.

Peat occurs in the southwestern part of the parish along the shores of Spanish Lake or Lake Tasse, and a few small areas west of Saint Martinville. It is always saturated, except in prolonged dry spells, when the upper 5 or 6 inches may be dry.

The material is derived from an accumulation of organic matter consisting principally of water hyacinths, fresh-water mosses, and water-loving grasses. None of the Peat is forested. It is used as a range for cattle.

SUMMARY.

St. Martin Parish is situated in the southern part of Louisiana, about 40 miles north of the Gulf of Mexico. It has an area of 692 square miles, or 442,880 acres.

The surface is prevailingly flat.

About six-sevenths of the area is drained by the Atchafalaya River and the remainder by Bayou Teche and Bayou Vermilion. The movement of drainage water is comparatively sluggish. The direction of flow is toward the south.

The first permanent settlement in St. Martin Parish was made between 1750 and 1760 by Spanish colonists. Shortly afterward Acadian exiles from Nova Scotia, Canada, settled along Bayou Teche. The present population consists largely of descendants of the Canadians and of negroes. The population of the parish in 1910 amounted to 23,070. Saint Martinville, in the southwestern part, is the parish seat and the largest town, with a population of 2,318. The improved part of St. Martin Parish has good railroad facilities and is well supplied with public roads, all of earth construction. As a rule the main roads are kept in good condition.

The climate approaches the subtropical. The mean annual temperature is 67.7° F., and the mean annual precipitation 53.95 inches. There is a normal growing season of 255 days.

Corn, sugar cane, and cotton are the principal crops. Rice is becoming an important crop. Irish potatoes and cabbage are grown on a commercial scale, particularly in the northern part of the parish. The growing of tabasco peppers and their manufacture into various condiments is an important industry. Hogs constitute the greater part of the live stock, although the extensive swamps are largely used as a range for beef cattle.

No definite crop rotation is practiced, and the adaptation of crops to the various soils has been studied little.

Excluding Peat, 11 soil types and 2 phases, representing 6 series, are mapped in St. Martin Parish. These are classed in three main groups, upland or high-terrace soils, low-terrace soils, and first-bottom soils. The uplands include the older alluvial deposits, and are of small extent. The low terraces are of more recent formation and include most of the improved soils of the parish. The first bottoms are largely swamps. They occupy about 70 per cent of the total area of the parish.

The Lintonia silt loam is very inextensive, but is one of the best agricultural soils in the parish. It is well suited to sugar cane, corn, and cotton.

The Olivier silt loam, which occurs in association with the Lintonia silt loam and is of about equal extent, is also an important type. It is nearly all under cultivation, being used largely in the production of sugar cane, corn, and cotton. The low phase of the Olivier silt loam is of greater extent than the typical soil. It is used for the same crops, of which it produces somewhat larger yields than the typical soil.

The Olivier silty clay loam lies somewhat lower than the silt loam. Sugar cane, corn, cotton, and some rice are produced on this type.

The Iberia silt loam differs from the Olivier silt loam chiefly in the dark-brown to black color of the surface soil. It is well suited to the production of sugar cane, corn, and cotton. Rice is grown to a small extent on this type.

The Iberia silty clay loam is an inextensive type. It is largely devoted to corn, sugar cane, cotton, and rice.

The Iberia clay is the principal rice soil of the parish, about 6,000 acres being devoted to that crop.

The Portland very fine sandy loam and silt loam are unimportant types occurring in narrow strips along the larger stream channels.

The Wabash silty clay loam is very inextensive. This soil is subject to overflow after heavy rains, and is used mainly as pasture land.

The Sharkey silty clay loam is an inextensive type bordering the swamps and subject to annual overflows. It is nearly all forested.

The Sharkey clay is by far the most extensive type in the parish, occupying nearly all of the first-bottom swamps. It is practically all forested, and used as a range for hogs and cattle.

Peat, the only cumulose soil mapped in St. Martin Parish, supports a growth of coarse marsh grasses. It is wet much of the time and none of it is cultivated. It affords some pasture.

[PUBLIC RESOLUTION—No. 9.]

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

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

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

Approved, March 14, 1904.

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

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