SOIL SURVEY OF ACADIA PARISH, LOUISIANA,

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LOCATION AND BOUNDARIES OF THE AREA.

Acadia Parish is situated in the southwestern part of Louisiana. It comprises an area of approximately 636 square miles. The Mermenton River, with a continuation known as Bayou Nez Pique, forms the entire western boundary, and another tributary, Bayou Queue de

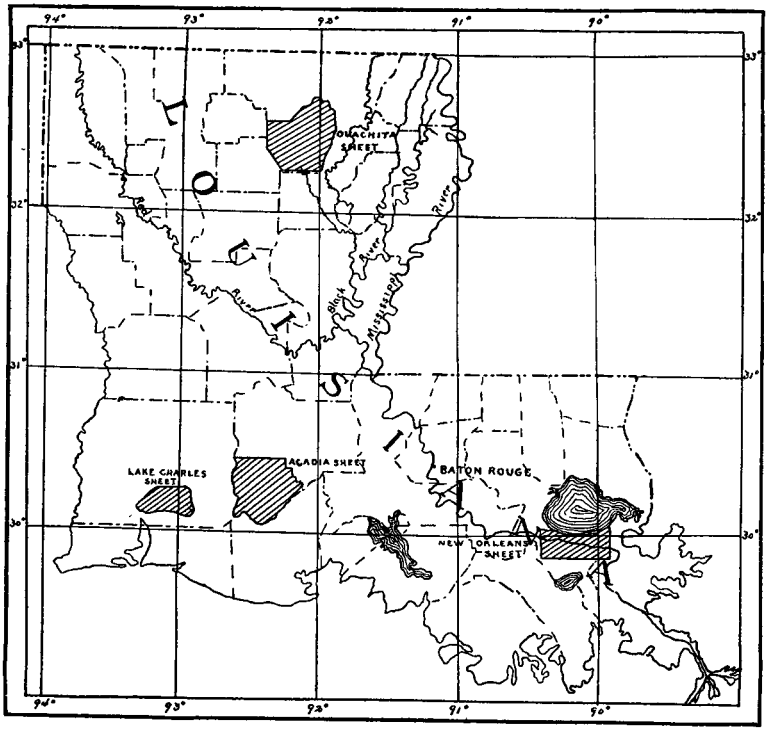

FIG. 20.—Sketch map showing location of the Acadia Parish area, Louisiana.

Tortue, forms the southern boundary. Acadia Parish is of especial agricultural interest, as it was first demonstrated here that rice could be grown on the prairies of the Southwest on a larger scale than anywhere else in the United States, and it is here that the industry has been more fully developed than elsewhere in the Southwest.

Crowley, a town of about 6,000 inhabitants, is the seat of parish government. It is a very important center, both for the marketing of rice and the distribution of machinery, work animals, and supplies to the planters. Smaller but growing towns have sprung up throughout the parish. Estherwood, Midland, Mermenton, Morse, Egan, Iota, and Trilby owe their existence to the rice industry. Rayne and Churchpoint have a cotton trade in addition. Evangeline has a shifting population engaged in the oil business.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

Acadia Parish was so named because people of Acadian descent first settled this area and, until only a few years ago, formed the greater part of the population. Between the 1st and 13th of January, 1765, a party of Acadian French, after being driven from their Canadian homes and wandering in exile for several years, arrived at New Orleans. Their destitute condition, as well as the story of their hardships, appealed so strongly to the citizens that they were assisted both by public funds and private subscription. From New Orleans they were sent west to form settlements, and the first colony was established at Opelousas, in what is now St. Landry Parish, but which for a long time included what is now Acadia Parish. From this point they gradually extended their settlements over the entire western part of the State. While they had accessions to their population from other peoples of French and Spanish descent, the newcomers conformed to the Acadian habits and manner of living, so that the language, customs, and ideals remained Acadian.

These Acadian settlers preferred the wooded streams. The old French and Spanish grants always describe a strip of land fronting on the stream. This topography was better suited to the agriculture which they practiced—the land was better drained, and there was wood for lumber and fuel, and abundant water for their herds of cattle.

With the exception of a few families, they were not a progressive people. Their wants were few, and easily supplied by their farms and herds of cattle, with a minimum amount of labor and care. They were great lovers of home. It was not customary for the young people to leave home to seek employment, nor would they engage in any business that would take them away from the land of their birth. As a rule they married young and settled down near the old homestead. In agriculture, as in everything else, they followed the methods of their ancestors. Such customs inevitably beget a spirit of complacency and satisfaction with environment that is not conducive to progress, so we find that for more than one hundred years the majority of the rural population made but small gains in wealth and little improvement in agricultural conditions.

The wealth of the early Acadians consisted of herds of scrub cattle and droves of inferior ponies. These animals grazed on the coarse grasses of the prairie, which was common pasture, and at that time accounted worthless for farming purposes. Small patches of corn and rice were grown for home use in the woodland clearings. When sugar cane was introduced, sirup and sugar were also made in small quantities for home consumption.

In 1803 Louisiana became a part of the United States, but little change was made in the laws, customs, or language of the people of this region. Few of the English-speaking people who settled the northern part of the State took up their abode in southwestern Louisiana, for the bare prairie gave little promise to prospective settlers.

After the civil war rice became one of the great money crops of the alluvial lands of Louisiana, and the crop was attempted on a slightly larger scale in western Louisiana. The primitive cultural method employed was what is known as "Providence" rice farming. The rice was planted in lowlands, and the local rainfall was depended upon for irrigation. In rainy years a fair crop was secured, but more frequently the crop was wholly or in part a failure. The work of seeding the crop was done by hand, and the primitive sickle was used to reap the grain and the flail to separate it from the straw.

The industry was in this unsatisfactory state until about 1885, when irrigation by steam pumps was successfully attempted. The irrigated areas were extended, and in 1894 the present canal system was introduced. Among the settlers from the wheat fields of the Northwest were some who conceived the idea of applying the latest machinery used there to the sowing, harvesting, and thrashing of rice. After some slight changes in the machinery the plan was successful, and the rice-growing industry in this section was revolutionized.

In 1886 the parish of Acadia was formed from a part of St. Landry Parish. In the following year the town of Crowley was laid out, and grew rapidly, becoming the parish seat. There was a phenomenal rush of settlers from all parts of the country, attracted by the profits of rice growing, but the greater part of this immigration came from the States of Illinois, Iowa, and Michigan. The southern and central portions of the parish have been well developed, and nearly all the land is cultivated to rice. In the northern and western parts of the parish there is still much unoccupied land, and there the population is steadily increasing. The Acadians by using the new methods have been very successful with rice, and within the last few years good crops of cotton have also been grown by them in the northeastern part of the parish.

CLIMATE.

Records of temperature and rainfall have not been kept within the limits of Acadia Parish, but the figures of the Weather Bureau for the towns of Lafayette and Opelousas in adjoining parishes, having practically the same elevation and climatic conditions, show such a great degree of similarity that they may be taken as approximately correct for Acadia Parish.

The climate of Acadia Parish is shown to be nearly that of the semitropics. The summers are long and hot, but tempered by the Gulf breezes. Freezing temperatures are never long continued. Bearing orange trees may be seen in this latitude, which indicates a period of several years without any severe cold. The appended table, showing the dates of the last killing frost in the spring and the first killing frost in the fall, indicates a growing season of sufficient length to permit the maturing of all the crops grown in this region.

The rainfall of the area is so distributed as to be especially favorable to the production of rice, and this fact has contributed largely to the extensive development of this industry. It will be seen from the tables that the months of heaviest rainfall are June, July, and August, when water is required by the growing crop, while the months of September and October, in which the crop must be harvested and thrashed, are comparatively dry. If rainy weather should prevail during the autumn it would be impossible for the farmers to care for the crops on their present acreage, and the average production would be greatly lessened, to say nothing of an occasional total loss of crops.

The healthfulness of this section has been thoroughly established. Although large numbers of the immigrants to the rice belt have come from northern latitudes they have had no difficulty in becoming accustomed to the climate. The standing water on the rice fields has not been observed to have any detrimental effect upon the health of the community.

Normal monthly and annual temperature and precipitation.

Month.	Lafayette.		Opelousas.		Month.	Lafayette.		Opelousas.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	*Inches.*	°F.	*Inches.*		°F.	*Inches.*	°F.	*Inches.*
January	51.9	4.76	52.2	4.80	August	81.3	6.06	81.4	6.13
February	55.0	4.28	51.4	5.26	September	77.6	3.42	77.6	3.45
March	61.5	3.74	62.5	4,63	October	68.3	2.90	68.4	3.14
April	68.8	4.72	68.8	3.70	November	59.8	4.10	59.0	4.24
May	74.7	2.01	74.8	3.07	December	54.2	4.05	51.8	4.64
June	79.9	6.90	78.5	5.97	Year	67.9	53.48	67.3	54.64
July	81.4	6.54	81.1	5.61					

Dates of killing frosts.

Year.	Lafayette.		Opelousas.	
	Last in spring.	First in fall.	Last in spring.	First in fall.
1894	Mar. 30	Nov. 12	Mar. 28	Nov. 4
1895	Feb. 20	Nov. 12	Feb. 21	Nov. 4
1896	Mar. 19	Nov. 8	Mar. 20	Nov. 9
1897	Feb. 5	Nov. 17	Feb. 24	Dec. 5
1898	Feb. 6	Oct. 22	Mar. 5	Oct. 27
1899	Mar. 29	Nov. 3	Mar. 8	Nov. 4
1900	Mar. 2	Nov. 12	Mar. 2	Nov. 10
1901	Mar. 21	Nov. 16	Mar. 8	Nov. 16
1902	Mar. 6	Dec. 5	Mar. 7	Dec. 5
Average	Mar. 6	Nov. 12	Mar. 7	Nov. 13

PHYSIOGRAPHY AND GEOLOGY.

Acadia Parish presents little variety of topography and surface features. A series of almost level, treeless plains is abruptly broken by stream channels, cut almost to sea level. These valleys usually comprise rolling slopes, on which the better drainage has permitted forests of pine, hickory, gum, and oak to make a good growth. The woodland areas vary in width from narrow strips of less than 100 yards along the small coulées or creeks to extensive tracts, covering many square miles, where several streams flow together, or where the character of the formations and their greater elevation have allowed more rapid erosion and the consequent drainage of a larger area. The soil which occupies this topography differs so widely in texture and agricultural possibilities from the prairie that it has been mapped as a separate type, called the Acadia silt loam.

The comparatively level prairies, however, are of far greater economic importance, for on them it has been possible to build up the rice-growing industry on a large scale. The elevation of these prairies varies from 15 to 47 feet. It decreases from north to south and from east to west, giving nearly all the streams a general southwesterly direction. Each successive prairie has its general level, but there is always sufficient slope to provide for the removal of the surface waters by gravitation, and yet not so much as to prevent the irrigation of considerable tracts, when low levees are used to restrain the irrigation waters. In addition to this general slope, there are almost imperceptible flat ridges of local extension, on which it has been found useful to construct the canals, and thereby keep the irrigation waters above the level of the surrounding country, obviating, in some cases, the necessity of a relift.

The drainage of the area is entirely toward the Mermenton River, which forms the southwestern boundary of the parish to a short distance above the town of Mermenton. The several larger tributaries

of the Mermenton, which carry to it the drainage of Acadia Parish and a considerable area to the north, are of importance as sources of supply for the irrigation canals. Of these streams the Plaquemine Brule is most heavily drawn upon for irrigation purposes.

The surface geology of the whole region is extremely simple. Acadia Parish, in common with the whole of Louisiana, is a part of that vast Gulf Coastal Plain, which has been reclaimed by the gradual uplifting of the whole region and the recession of the waters of the Gulf of Mexico. The surface formation, from which the soils of the area have been derived, is classed with the Port Hudson Pleistocene. In geological computation, therefore, the prairie region is of very recent formation, being younger than any other except the areas covered by alluvium and recent coastal deposits.

The boring of both deep and shallow wells in search of oil and irrigation water has aided the geological survey of Louisiana to obtain valuable evidence as to the manner in which the later strata of the Gulf Coast were deposited. At surprisingly shallow depths the drill brings up both fresh-water and brackish-water shells of the species found in deposits now accumulating in Lake Pontchartrain and other lakes of southern Louisiana, showing that at comparatively recent times the areas occupied by these prairies were shallow lakes in which brackish-water conditions prevailed.[a] By traveling from the Gulf of Mexico inland one may see the successive stages by which these lakes have been filled. Areas of shallow water are being partially cut off from the Gulf by sand reefs and converted into brackish lakes. Farther inland the coastal uplift has formed a succession of lakes, which become more and more shallow, until they constitute extensive sea marshes traversed by sluggish bayous. These are finally filled in by silts and clays, and pass into the broad, level, silty stretches which constitute the prairies of Acadia Parish. Where the agencies of erosion have not brought about local variations by removing the top soil and exposing the subsoil clays, or by filling a depression with loamy materials, the soils may be generally classed as silts and fine sands, underlain by yellow or mottled clays of an extremely impervious nature. The underlying clays are highly calcareous, and the excess of calcium carbonate is manifested over the greater part of the area by the occurrence of lime concretions within a few feet of the surface. In some poorly drained localities the concretions are found in thick masses, even at the surface. These calcareous bodies are usually nearly spherical, and vary in size from one-fourth of an inch to several inches in diameter. The clay in which they occur in great abundance is more sticky and plastic, and has a uniform yellow color instead of the mottled brown and red appearance of the prevalent subsoil clays.

[a] G. D. Harris. Geological Survey of Louisiana, report of 1902.

The changes from one of these subsoils to the other are too frequent and irregular to allow any classification by this feature.

Iron streaks and stains are a common feature of the mottled clays, and iron concretions are found in all the subsoils of the area. In poorly drained localities the concretions occur in beds several inches in thickness, at a depth of 2 feet or more. They vary in size from minute particles up to half an inch in diameter.

A peculiar feature of the surface of southwestern Louisiana is the presence of sandy mounds, popularly but erroneously known as Indian mounds. These mounds occur at any elevation in Acadia Parish, both in the woodland and on the level prairie, but they are more regularly distributed on the latter topography. In some localities they occur with such seeming regularity of position as to suggest the display of intelligence in their origin and arrangement, but this view is hardly tenable. They occur at an average distance of about 40 yards apart. In diameter they range from 20 to 40 feet, and in height never exceed 2 feet.

On the prairie the tops of these mounds are usually bare of vegetation, or where rice is planted it is very late in maturing. This is due to the accumulation of alkali salts which have been brought up by capillary action in the water and deposited by the rapid evaporation of the water from the tops of these mounds. On the cultivated prairie the mounds have generally been leveled, as they interfere seriously with the irrigation of a rice crop, but the former location of the mounds can be accurately traced by spots of excessively alkaline soil.

These mounds are composed of silts and fine sands, invariably coarser in texture than the surrounding top soils. Where these mounds are large and thickly placed, they have modified the texture of the soils of the locality to a considerable extent. The more sandy nature of the soils on Mamou Prairie is largely due to the spreading of these mounds over the surrounding area. The mounds are underlain by a heavy clay not differing from the usual clay subsoil. Exposed cross sections of the larger mounds show an upward curvature of clay almost parallel with the outline of the mound.

The probable origin of these mounds has been a source of contention since the time they were brought to the attention of the scientific world. As there is no new evidence to bring forward that would throw any light on their structure or probable origin, and as the many theories of their formation have been presented in former reports of this Bureau, it is hardly profitable to take up the matter at this time. It is only necessary to state that no theory yet advanced has been supported by sufficient proof to make it entirely satisfactory.

The mineral resources of the parish are clay (for brickmaking) and petroleum. The development of the oil fields at Evangeline, within the area, as well as elsewhere in the Southwest, is in itself of no

agricutural interest, but indirectly it has had a marked effect on the agricultural development of the area. The disadvantages are found in the high land values resulting from speculation and in the holding of farm lands for speculative purposes at a fictitious value; but these are more than counterbalanced by the cheap fuel that has been found in the crude oil. Nearly every engine in the parish is run by oil, and the price of fuel is a very important consideration in irrigation.

SOILS.

Seven types of soil, including Swamp, have been recognized in Acadia Parish. As a rule, these soils are uniform over large areas and the transitions from one type to another are so gradual as to make the establishment of soil boundaries a matter of close observation.

It will be seen from the analyses that the fine sands and silts predominate in the composition of these soils without great variations. In the field, however, the classification of the soils was not entirely a question of texture, for the topography, drainage, and crop-producing power, as they affect the money value of both crop and land, had to be given careful consideration.

The areas of the soil types are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.
Crowley silt loam	244,160	60.0
Acadia silt loam	89,280	21.9
Landry silt loam	37,696	9.3
Lake Charles fine sandy loam	28,032	6.9
Lake Charles loam	4,608	1.1
Swamp	1,728	.4
Morse clay	1,664	.4
Total	407,168	.....

CROWLEY SILT LOAM.

The Crowley silt loam is the typical rice land of southwestern Louisiana. By structure, topography, texture, and productiveness it is peculiarly adapted to the growing of rice on a large scale and at a minimum expense. The soil ranges in depth from 10 to 25 inches, but the usual and average depth is about 16 inches. It is a brown or ash-gray loam, composed of fine sand and silt, with a sufficient proportion of clay to give it a loamy cohesiveness and to render it impervious to such a degree that pools of water collecting on the surface usually remain until evaporated. If it is plowed when quite wet there is a slight tendency to puddle.

The subsoil which underlies this soil may be of two grades, depending apparently upon the content of calcium carbonate. The typical

subsoil, and one which occurs on the prairie in all localities of average drainage, is a clay of mottled brown and yellow color, interspersed with streaks and blotches of a brick-red color, and in many localities with iron-rust stains. At lower depths the clay becomes lighter in character, and in some places grades into a silty, friable clay below 3 feet. Scattering lime concretions are nearly always present. Iron concretions are also of common occurrence and may be abundantly developed in poorly drained localities. In some places the subsoil is a sticky, plastic clay of a uniform yellow color. The excessive lime content has resulted in the segregation of this material into concretions which may occur in great abundance in zones of 6 or more inches in thickness at a depth of 1 to 3 feet.

It has not been observed that these differences in subsoil have any effect upon the character of vegetation. Both grades of subsoil are extremely impervious, and it is for this reason that the Crowley silt loam is held in such high esteem as a rice-producing soil. The subsoil is extremely retentive of the water applied to the surface for the benefit of the growing crops, and the irrigation canals, cheaply and conveniently constructed of this material, hold their water so efficiently that the seepage through the levees of a properly constructed canal is so small as to be negligible.

The Crowley silt loam occupies the comparatively level series of prairies in the southern and central portions of Acadia Parish. There is a gradual and almost imperceptible increase in fineness of texture from the western to the eastern side of the parish. Along the western boundary the type gives way to the Lake Charles fine sandy loam, while on the extreme eastern edge of the parish it grades into a loam so heavy in texture as to merit description as a separate soil type.

The transition from one type to another is so gradual that no change in texture can be detected within short distances. Each locality also has its special depth of subsoil, though 16 inches is the depth over a large part of the area. On a level prairie east of Branch the soil attains a depth of 25 inches over an extensive tract. Otherwise the characteristics of the type are preserved, and where irrigation has been practiced good yields of rice have been secured.

The surface of the prairie where this type of soil occurs is so nearly level as to allow the even application of water to the rice crop over considerable areas, and in some cases over a 160-acre farm without terrace levees. The irrigating channels, with an initial elevation of only a few feet, sometimes extend for from 1 to 6 miles without a relifting plant. There is still much land in the northern part of the parish which has a topography suitable for surface flooding, but is yet undeveloped on account of a lack of water convenient for irrigation.

Although the land is so uniformly flat and the subsoil so impervious no public or cooperative system of drainage has been undertaken,

though it is generally conceded that drainage would be very beneficial. The rainfall is so distributed that a general drainage system has not been absolutely necessary for rice growing. The autumns are usually dry. When the water is turned off the fields shortly before harvesting, although the drainage is slow, the evaporation is rapid, and in a short time the fields are firm enough to bear the weight of the heavy harvesting machinery. Drainage, however, would be of great service in improving the condition of the soil for planting and in removing any accumulations of alkali. The elevation of this type above the level of water in the bayous gives a sufficient fall to make the disposal of the water after it has been drawn from the fields comparatively easy.

It is quite natural that a crop so easily grown and so profitable as rice would become the sole interest on all lands to which it is adapted. From the time that the Crowley silt loam was first cultivated rice has been the only crop to receive attention. Notwithstanding this continued annual cropping with the same crop, without attempting in any way to maintain the productiveness of the soil, there has as yet been no decrease in yields. On the contrary, it is asserted that the soils increase in productiveness for several years as they become aerated and brought into better physical condition. The one-crop system will, however, soon have its effect unless more care is taken of the soil resources.

The yield of rice is from 6 to 15 sacks per acre under ordinary conditions. Larger yields are sometimes reported, but they are exceptional. The average yield through good and poor years is not far from 10 sacks per acre.[a]

It has been demonstrated that cotton may be successfully grown on the better drained portions of the Crowley silt loam, and, if it should become more profitable, there is no reason why it should not be grown over the entire rice belt. Experimental plats near Crowley have produced a bale to the acre without fertilizers. Nearly all crops requiring a heavy loam soil should be successful on the Crowley silt loam.

[a] The weight of a sack of rough rice ranges from 140 to 200 pounds.

The following table shows the texture of typical samples of this soil:

Mechanical analyses of Crowley silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
9988	No. 4–40, sec. 25, T. 9 S., R. 1 W.	Gray silty loam, 0 to 16 inches.	0.77	0.64	1.74	0.66	0.92	4.20	68.84	22.92
9990	No. 14–40, sec. 9, T. 10 S., R. 1 E.	Gray silty loam, 0 to 16 inches.	1.23	.90	2.02	.76	.82	7.78	64.30	23.40
9974	No. 4–40, sec. 8, T. 8 S., R. 1 E.	Silty loam, 0 to 16 inches.	2.06	.00	.38	.30	3.20	12.52	55.20	27.92
9991	Subsoil of 9990.....	Mottled silty clay, 16 to 36 inches.	.69	.40	1.18	.40	.84	5.58	64.62	26.98
9975	Subsoil of 9974.....	Mottled clay, 16 to 36 inches.	.83	.28	.86	.56	3.38	8.42	56.80	28.90
9989	Subsoil of 9988.....	Mottled silty clay, 16 to 36 inches.	.69	.10	.42	.24	.78	2.36	58.60	36.50

LANDRY SILT LOAM.

The Landry silt loam differs from the Crowley silt loam in composition and in topographic position. The soil is a dark-brown silt loam, which breaks up into excellent physical condition. It is retentive of moisture and easily tilled. The superior qualities of this soil for purposes of general farming are in a large measure imparted to it by its larger percentage of organic matter. The subsoil is found at an average depth of 10 inches. It consists of brown heavy silty loam or silty clay, which passes gradually into the underlying greenish-yellow or drab silty clay. The structure of this clay varies with the conditions of drainage and the stage of weathering. It usually becomes more pervious and friable at lower depths. Both lime and iron concretions occur in the subsoil, the lime concretions being most abundant at about 30 inches.

This soil occupies an almost unbroken area in the northeastern corner of Acadia Parish and extends along the eastern border. The topography is that of a slightly rolling prairie and the inequalities of the surface prevent the cultivation of rice on any large scale. Drainage is not so uniform as on the level rice land. The greater part of the area is better drained, but there are occasional depressed areas and sloughs which have no outlet for their drainage.

This prairie phase owes its present condition to its more advanced stage of physiographic development. Erosion has gone on more extensively than in the southern part of the parish and the underlying clays have been subjected to more rapid weathering. In addition, local swamp conditions seem to have prevailed, and still prevail in some

localities, which may account for the larger proportion of organic matter.

Rice is grown only in restricted areas. Besides the difficulties of topography, there is no adequate supply of water for irrigation purposes. Cotton and corn are the principal crops. The cotton crop is very profitable, yields of three-fourths of a bale per acre being common. No fertilizers are used. Corn yields fairly well, even under the poor cultural methods usually employed.

The following analyses show the texture of the Landry silt loam:

Mechanical analyses of Landry silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
9982	Cen. sec. 7, T. 7 S., R. 2 E.	Brown silty loam, 0 to 18 inches.	1.76	0.10	0.66	0.28	2.86	11.44	67.60	16.90
9980	No. 13–40 sec. 15, T. 7 S., R. 2 E.	Brown silty loam, 0 to 12 inches.	1.88	.98	1.80	.76	.98	6.38	69.38	19.14
9984	No. 5–40 sec. 28, T. 8 S., R. 3 E.	Brown silty loam, 0 to 10 inches.	2.43	.80	1.44	.62	1.04	3.40	72.50	19.28
9985	Subsoil of 9984.....	Silty clay, 10 to 36 inches.	.25	.36	.88	.36	.96	1.68	74.20	20.98
9983	Subsoil of 9982.....	Gray silty clay, 18 to 36 inches.	.64	.56	.78	.28	1.58	7.50	67.88	21.20
9981	Subsoil of 9980.....	Mottled silty clay, 12 to 36 inches.	.22	.60	.84	.48	.88	1.68	69.50	25.26

ACADIA SILT LOAM.

The soil of the Acadia silt loam consists of a white or light ash-gray silt and fine sand. It is somewhat compact, and has sometimes a chalky structure when in position, but grinds up readily into a white, fluffy powder. The washes and gullies through this soil usually contain a sediment of almost pure silt. The soil ranges in depth from 16 to 30 inches, depending on the steepness of the slope which it covers and the extent of the erosion and weathering. The subsoil is a silty clay of a mottled brown and yellow color, interspersed in many localities with streaks of red. This clay differs from the subsoil of the Crowley silt loam in that it is more friable, less plastic, and the silty texture is more noticeable. These differences are due to the influence of a more rapid weathering and a freer percolation of water through the soil, and are naturally more pronounced on the steeper stream slopes. The high lime content of this subsoil is evident from the frequent occurrence of lime nodules. Iron concretions are also common.

The Acadia silt loam ranks second in area among the soils of Acadia Parish. It occurs as a narrow border along every principal stream,

and widens out into extensive areas where the conditions are favorable to rapid erosion. The classification of the Acadia silt loam as a new type has been determined largely by topography. The broken, rolling character of the land, if there were no textural differences in the soil, would be sufficient to make a great difference in agricultural value, since its agricultural interests must be entirely different from those of the level rice lands. It covers the rolling valleys which have been carved out by the streams from the original prairie uplands, with small, low strips of land subject to overflow.

The cultivation of rice on such land is impossible; hence agriculture has been neglected. Before rice became the great money crop of this region the Acadian settler preferred this type of soil, but he did little farming. Shade and water for herds of wild cattle and timber for building purposes and fuel were the primitive needs of the settler, and these could be supplied in the woodland bordering the streams. The timber, however, is constantly increasing in value. Fence posts are in demand for inclosing the hundreds of square miles of prairie, and rough lumber is needed for building purposes. The native forests consist of pine, oak, gum, and hickory, and some cypress is found on very low ground. The best trees have been cut, as a rule, but enough remains of the less serviceable timber to give much of this land a substantial value.

So little of this land is under cultivation that no correct estimate can be made as to its productiveness. Where corn is grown the yield is light, but the best methods of cultivation are not employed. The high price of cotton is causing a large increase in the acreage of that crop, and we may confidently expect to see, within a few years, large areas of these hillsides devoted to cotton.

The following analyses show the texture of typical samples of the Acadia silt loam:

Mechanical analyses of Acadia silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
9994	No. 3–40, sec. 19, T. 9 S., R. 2 E.	Brown silty loam, 0 to 18 inches.	1.50	0.54	0.98	0.54	1.60	4.34	72.00	19.94
9992	1½ miles N. of Estherwood.	Yellow silty loam, 0 to 16 inches.	.34	.60	1.94	.86	1.86	7.64	65.78	21.30
9995	Subsoil of 9994.....	Clay loam, 18 to 36 inches.	.46	.24	1.24	.96	2.20	2.80	69.40	23.06
9993	Subsoil of 9992.....	Brown silty clay, 16 to 36 inches.	.28	.30	.62	.34	.88	3.24	55.60	38.96

LAKE CHARLES FINE SANDY LOAM.

The Lake Charles fine sandy loam is a very sandy brown or ash-gray loam, having a depth of from 16 to 30 inches, passing into a clay loam, and finally into a mottled brown and red clay. The soil differs from that of the Crowley silt loam in its sandier texture and greater depth. The clay subsoil is not so finely divided or so compact as that of the Crowley silt loam, but it resists the percolation of water almost as well. The subsoil contains the characteristic concretions of lime and iron, but they are scarcely so numerous or so generally distributed as in the other types of the area.

The Lake Charles fine sandy loam occupies an extensive area along the western side of Acadia Parish, on what is known as Mamou Prairie, lying between Bayou des Cannes and Bayou Nez Pique. This type has the same relative position as the Crowley silt loam on other prairies of the area. It stretches in an unbroken area from the northern border of the parish southward for 17 miles, and has an average width of 2 to 3 miles. It shades so gradually into the Crowley silt loam in the northern part of the area that it has been almost impossible to define exactly its limits.

The topography covered by this type in its southern extension does not differ from that of the Crowley silt loam, and rice may be grown with success. The northern part of the area becomes gently rolling, and rice growing is not practiced, except on small farms which are level enough to permit a local system of irrigation. Drainage is good over all parts of the type. The elevation is sufficient to give ample slope, and the depth and sandy nature of the soil permit the rapid removal of excessive soil moisture.

The development of the Lake Charles fine sandy loam may be ascribed to two facts—the elevation, which has favored deep weathering, and the numerous sand mounds, which have added greatly to the sand content of the soil, and slightly to its depth.

There are at present more than 7,000 acres of this type devoted to the cultivation of rice. Two company canals supply the water for irrigation. The yield on this type is not so large as on the Crowley silt loam, 7 to 8 sacks per acre being an average crop. Early truck does well on this soil and is grown to some extent to supply the oil-producing town of Evangeline.

The texture of the soil and subsoil is shown by the following analyses:

Mechanical analyses of Lake Charles fine sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
10005	No. 16–40, sec. 43, T. 9 S., R. 2 W.	Brown sandy loam, 0 to 18 inches.	1.51	1.00	1.52	1.00	6.84	28.14	50.04	10.90
10007	Sec. 12, T. 7 S., R. 2 W.	Fine sandy loam, 0 to 18 inches.	1.43	.44	1.30	.30	4.70	21.76	56.38	14.38
10009	No. 8–40, sec. 28, T. 8 S., R. 2 W.	Fine sandy loam, 0 to 30 inches.	1.59	.12	.58	.38	6.10	18.74	56.40	17.62
10006	Subsoil of 10005....	Loam to red clay, 18 to 36 inches.	.71	.20	1.06	.80	5.36	9.96	56.10	25.60
10008	Subsoil of 10007....	Brown mottled clay, 18 to 36 inches.	1.14	.74	1.30	.40	5.10	14.70	50.32	27.42
10010	Subsoil of 10009....	Silty clay, 30 to 36 inches.	.41	.40	.80	.50	11.90	14.12	38.70	33.30

LAKE CHARLES LOAM.

The Lake Charles loam is the strongest soil of the area. It consists of a heavy black clay loam with an average depth of 7 inches, underlain by a yellow or drab sticky or waxy clay. The soil contains a large percentage of organic matter in a thoroughly decomposed state. Both soil and subsoil are calcareous, usually more so than those of any other type of the area, and lime concretions occur in masses even to the surface.

The Lake Charles loam occurs in small strips along many small streams in all parts of the parish, and in more extensive areas in depressions in the prairie of the northeastern part of the parish. The type occurs along the streams on gentle slopes and small areas subject to overflow. There is usually a heavy timber growth of pine, oak, sweet gum, and hickory. The prairie areas of the type are almost level. This soil is derived from the accumulation of loam and vegetable matter brought in from higher localities.

The smaller areas of this type are of no agricultural importance. Their location on the stream slopes makes rice growing difficult. The land is also difficult to till, but the soil is very productive, and where rice growing is attempted good yields are secured. Corn does well and cotton is especially adapted to the Lake Charles loam. Nearly a bale to the acre is not an exceptional yield.

The larger areas of this soil in the northeastern part of the parish support a growth of grasses valuable for pasturage, and the dairying

industry could be profitably taken up in this locality. So far it has not been attempted. This soil is also adapted to the vegetables which thrive on a rich clay with much organic matter.

The following analyses show the texture of typical samples:

Mechanical analyses of Lake Charles loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
9999	No. 13-40 sec. 16, T. 7 S., R. 2 E.	Brown loam, 0 to 8 inches.	2.84	0.26	0.60	0.34	1.02	4.48	81.28	12.00
10003	¼ mile E. of sec. 30, T. 8 S., R. 3 E.	Black clay loam, 0 to 18 inches.	1.39	.36	.62	36	1.04	2.70	74.12	20.80
10001	Sec. 36, T. 9 S., R. 2 W.	Black heavy clay, 0 to 6 inches.	1.71	1.40	3.26	2.62	3.98	4.22	52.30	32.20
10004	Subsoil of 10003....	Stiff clay, 18 to 36 inches.	.26	.64	.60	.28	.56	1.94	75.80	19.54
10000	Subsoil of 9999.....	Black heavy clay, 8 to 36 inches.	1.47	1.38	1.08	.50	1.26	4.96	69.86	20.96
10002	Subsoil of 10001....	Waxy clay, 6 to 36 inches.	.97	2.36	2.04	.70	1.16	1.36	47.28	45.06

MORSE CLAY.

The Morse clay consists of a heavy, silty loam soil to a depth of 6 or 8 inches, underlain by a heavy mottled clay. Both soil and subsoil are calcareous, and lime concretions are found in abundance at a depth of 2 feet.

The Morse clay occurs in small and unimportant areas along the stream courses in various parts of the area. It owes its origin to the removal of the silty materials by erosion and the subsequent weathering of the underlying clays. It occupies a rolling topography and is favored by good drainage. A heavy growth of pine, oak, hickory, and sweet gum covers the type, with the exception of its largest area, which is located south of Morse.

So little of the soil is under cultivation that it is difficult to give estimates as to its productiveness. It is more difficult to till than the silty soils of the area, and has therefore been neglected. Rice does well where the topography will permit of its irrigation. The type is also adapted to corn and cotton in its better drained areas.

The following analyses show the texture of samples of this type:

Mechanical analyses of Morse clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
9997	¼ mile E. of Jennings Bridge.	Silty clay, 0 to 8 inches.	0.70	0.58	1.20	0.74	1.90	2.90	51.74	40.90
9998	Subsoil of 9997.....	Mottled clay, 8 to 36 inches.	1.22	.50	.56	.08	.50	3.02	41.00	54.20

SWAMP.

Along the Mermenton River, in the extreme southwestern part of Acadia Parish, there is a strip containing several square miles of swamp. This swamp is of no agricultural value whatever. It consists of a mass of partially decayed vegetation, underlain by a silty or sandy loam composed of the wash from the upland.

The area occupied by this type has the lowest elevation in the parish. It is partly covered by standing water and is subject to frequent overflow. The timber growth is cypress, with other water-loving trees along the borders.

WATER SUPPLY FOR IRRIGATION.

The greater part of the water used for irrigation in Acadia Parish has been supplied by the system of canals leading from the Mermenton River and its tributaries, but the deep-well system is rapidly spreading, especially in localities that can not be reached by canals. Both systems of irrigation have their supporters, and opposite views are held as to the relative merits of bayou and well water. It is a question for each farmer to decide for himself, after taking into consideration the needs of his farm and his local conditions. Those who depend upon the canal system, with the stream as a source of supply, are almost sure of an ample amount of water at a reasonable cost, and where a certain part of the crop is taken in payment for the water, the canal company shares the success or failure of the farmer.

The great danger in the use of canal water in the past has been the presence of salt in the water of the bayous in dry seasons. The Mermenton River and its tributaries may be regarded as extensions of the Gulf of Mexico, inasmuch as they are almost at Gulf level. The Gulf waters, at high tide, ascend the streams as a stratum of salt water

beneath the surface. When there is an average rainfall over the drainage basin the overlying fresh water is sufficient to supply the farms, but when droughts occur the fresh water is exhausted and the salt water is drawn up into the pumps. In 1902 great damage resulted from this cause. The brackish waters greatly retarded the development of the crop, and in many localities there was a total failure. During the past year a dam has been constructed across the Mermenton River to prevent a recurrence of this disaster.

The system of deep-well irrigation is still in process of development. The wells are sunk into the Lafayette stratum of water-bearing sands and gravels, lying from 150 to 300 feet below the surface. The water in rare cases may rise to the surface, but the usual range of depth is from 5 to 25 feet below the surface. This variation is not due entirely to a difference in topography. The subterranean waters of southern Louisiana are derived from the water that has fallen upon and been absorbed by the porous Lafayette strata which outcrop against the northern border of the Port Hudson. The waters, sinking downward and southward, are confined, at a considerable depth below their source, between the impervious Miocene clays below and the Port Hudson above. The resulting hydrostatic pressure is weakened toward the south, but not destroyed, by the slow escape of the waters into the Gulf.[a] The level of water in the wells which tap this supply, however, is not uniform. There are local variations which are determined by the rate of escape toward the Gulf through the interbedded strata. Wells quite near each other may maintain different water levels and have their several rates of flow.

Most of the wells, when properly put down, have stood the test of severe drought without any great lowering of the water from constant pumping. The water is, with rare exceptions, free from any injurious minerals.

SPECIAL SOIL PROBLEMS.

The question of the advisability of using commercial fertilizers is beginning to concern the rice growers of this area, and the agitation is likely to increase within the next few years. Various forms of commercial fertilizer have been used by large rice growers near Crowley. Some benefit is claimed in nearly every instance, but which of the elements of fertility is most beneficial, and to just what extent, is not yet definitely ascertained. It is almost impossible for the farmer to make any accurate deductions under the conditions of ordinary farming, and there is great need for systematic experimentation in cultivation and fertilization in the rice belt. It is not certainly known that the rice lands have decreased in productiveness during the short time that they have been cultivated; on the contrary, the soil has, as a

[a] G. D. Harris. Geological Survey of Louisiana, report of 1902.

rule, increased in yield as a result of aerating the formerly poorly drained prairies, and a large part of the rice belt has probably not yet reached its maximum of productiveness. Hence the few progressive farmers who have used fertilizers have done so in an experimental way rather than through necessity. Some remedial measures will, however, be necessary before many years if the present operations are continued. Rice cultivation is not especially exhaustive on the producing power of the land, but if this crop is grown constantly, to the exclusion of all other crops, we may expect to see the same soil deterioration which has resulted elsewhere from the one-crop system. While some improvement has been made in the soil by rice growing, the inundation of the fields during a large part of the year, as well as the shallow plowing practiced before planting, prevents the establishment of the best physical conditions in the soil, and does not favor the existence of the nitrifying organisms which perform such an important service in soil renovation. These facts lay great emphasis on the need of a crop rotation which shall include a well-cultivated crop, and also, if possible, a leguminous crop. Such a crop rotation or alternation would render the additional service of ridding the land of red rice and the obnoxious weeds and grasses which secure a strong foothold where rice is cultivated for many years. If the farmer would put half his present acreage in rice and the remaining land in some other crop, he could, by careful farming, produce almost as much rice, of equal or greater market value, and at the same time grow feed for his horses, cattle, and hogs.

The difficulties of such a rotation are not to be underestimated. The rice lands are almost level, and to carry a field under dry cultivation, while the adjoining field has standing water several inches deep over its surface, would be almost impossible without some better system of local drainage.

An extensive system of drainage is one of the most pressing needs of Acadia Parish. Besides the opportunity it would afford to grow cotton and other crops on the same farm with rice, there would be the convenience of quickly ridding the farm of the irrigation waters at harvest time, and the benefit of removing the deposits of alkali which form on the surface through the evaporation of irrigation waters, and which, if allowed to accumulate, may become dangerous to the rice crop.

AGRICULTURAL METHODS.

By the "Providence" method of the Acadians, the success of the rice crop was dependent on the amount and distribution of the rainfall, as no provision was made to conserve the surplus water for use in seasons of drought. The crop was planted in small patches on low, flat areas along the bayous, where the drainage from the uplands could

be turned upon the field. By this method good crops were seldom secured, and total failures often occurred. The first improvement over this method was the damming of the water in a part of the field by levees thrown up with shovels. The levees were cut later, and the water allowed to spread over the crop. This was a move in the right direction, but it had its disadvantages. The reservoirs covered too much land, and the amount of water thus stored up was not sufficient to carry the crop through long droughts. In 1885 Duson Brothers demonstrated that the water of the bayous could be successfully used, and economically so, to irrigate the level prairie lands. The pumps first used by them on their farm near Crowley were not of the most efficient type, but in 1892 they tried the centrifugal pump, which proved a great success. Two years later Abbott Brothers built a canal to distribute water over the prairie lands. The canal system rapidly spread over the Southwest, but has been most fully developed in Acadia Parish. It is not possible here to describe each canal and its equipment. The wonderful extension of the system may be seen in the fact that over 400 miles of canals and laterals have been constructed by the various companies and individuals, and not less than 100,000 acres are irrigated in this parish. To lift the large quantities of water required from the streams to the level of the prairie necessitates large and well-equipped pumping plants. The large plants lift from 20,000 to more than 100,000 gallons per minute. Both rotary and centrifugal pumps are used. The engines usually range from 100 to 400 horsepower. Crude oil has proved the most economical fuel. The water is discharged into wooden flumes built at the level of the prairie, from which it flows back into the canals. The canals are constructed above the surface by throwing up parallel levees of the impervious clay. They are several feet high near the pumping plant, in order that the water may flow back several miles without a relift.

The canal companies usually charge a rent of one-fifth of the crop for the use of the water. Where a fixed amount is charged the rent is usually two sacks of rough rice per acre at the time of thrashing.

While the methods of irrigation were undergoing such a wonderful development, the methods and machinery for all the operations of rice farming were being improved with equal rapidity. By the present method the rice land is broken in the early spring by gang plows drawn by four mules. Shallow plowing is commonly practiced, and two reasons are advanced in its defense: It is difficult to pulverize the clods after deep breaking, and at harvest time the heavy machines will sink down as deep as the ground has been broken, unless the land is very dry. The depth of plowing is from 2½ to 4 inches. There is no doubt, however, that the crop is better after deep plowing, and this difference will become more noticeable the longer the land is cul-

tivated. The broken land, after a few weeks, is pulverized by the disk or spring-tooth harrow, followed by the smoothing harrow until it is ready for the reception of the seed.

The selection of good seed is of the greatest importance. Seed rice should be flinty, uniform in size, and free from broken grains, weed and grass seeds, and red rice. The drill is now generally used in sowing the seed. Planting takes place from the latter part of April to the first of June.

When the young plants are several inches high, water is turned on the field and kept continuously at an average depth of about 3 inches. The season of irrigation usually lasts about ninety days. When the kernel is in the dough state the water is drained from the field as rapidly as possible, that the ground may become solid enough to bear the weight of the harvesting machines. The application of the wheat harvester, with some slight modifications, to the work of harvesting rice marked a new era in the industry, and the primitive sickle has been entirely displaced throughout the prairie region.

The grain is removed from the straw in the field by the ordinary steam-power separator. The power is supplied by a 16 or 18-horse-power engine. Thrashing costs the farmer about 10 cents a sack where he supplies the hands. From 15 to 20 hands are required to run a thrasher to its full capacity where the grain must be hauled to the machine.

The rough rice is put into sacks of an average weight of 162 pounds each and hauled to the mill. The "rough rice" or "paddy" is the grain proper inclosed by a closely fitting cuticle and a rough outer husk. The object of milling is twofold—to remove the husk and cuticle with as little breakage of the grain as possible and to bring the surface of the grain to a high state of polish, that it may meet the demands of the market. The clean rice is then graded and marketed in sacks or packets of 100 pounds each.

AGRICULTURAL CONDITIONS.

Although the prairie region, which includes the area of the present survey, has been partially settled for nearly a century and a quarter, the conditions of to-day are those which prevail in a newly settled country. Less than two decades ago the broad prairies were used by the Acadians only as pasture for herds of cattle and scrub ponies. There were no fences and travelers rode at will over the country. The Acadians lived along the strips of woodland in mere huts without the comforts of modern life. The announcement that rice could be grown on the prairies by means of irrigation brought about a rapid change. Settlers poured in from all parts of the country. Capital was available for the construction of canals and rice mills. The prairies

were divided into flourishing farms, with substantial buildings and modern farm machinery. Large profits were realized in rice farming, and land values rose in proportion.

The more conservative questioned this apparently over-prosperous condition. There was a feeling that the possibility of a failure of the crop had not been fully discounted. It was believed by many that the price of rice could not hold up under the load so suddenly thrown upon the market. While there were some variations in yield and unsteady prices, no serious trouble was experienced by the rice growers of Acadia Parish until 1902, when salt water ruined the crop in the fields. This misfortune, however, had no permanent effect on the agricultural progress of the parish. The crop of the succeeding year was most satisfactory, both as to yield and prices realized. There is a feeling of confidence that further harm from salt water will not be experienced, and it may be safely said that the rice industry is on a substantial basis. The average that may be expected in the way of profits has been determined and the highly speculative feature has been removed. Large fortunes are not to be made in a single year, but good average crops may be relied on with more certainty than in the growing of most farm products elsewhere. The increase in the domestic consumption of rice and the opening of foreign markets assure a steady demand at remunerative prices. There will doubtless be periods of depression, but with conservative management on the part of the rice grower the outlook is promising for continued prosperity.

The transfer of farming lands has taken place so rapidly during the last few years that no data are available as to the average size of farms or the conditions of tenure. A few corporations and individuals own and farm large tracts. The canal companies own land, which is usually for sale or rent. The newcomers who lack capital find it advantageous to rent for one or two years. Where the company furnishes the land, seed, and water, one-half of the crop is charged as rent. In the northern part of the area, among the cotton growers, there are many small landholders. The average size of the rice farms is estimated at 100 acres. This is a satisfactory size where the farmer has 60 to 80 acres in rice.

There has been a tendency in the past for the farmer to attempt to till too much land, but of late years he is wisely paying more attention to the quality of his product, which involves not only the best of care in sowing and harvesting, but also the elimination of red rice and weeds, whose seeds so greatly depreciate prices.

Since the cultivation of rice began on the prairie lands they have risen in value from 50 cents and $1 an acre to $10 and $25 for unimproved land, and $25 to $75 for improved and irrigated farms. The rolling woodland sells for from $3 to $10 an acre, according to location and the value of the timber.

The expenditure for labor is a most serious matter to the rice grower of Acadia Parish. Wages are at least 50 per cent higher than in the other rice-growing sections of the country, but this is offset in large measure by the large areas which are cultivated. After the crop is planted little labor is needed until the time of harvesting and thrashing. Every available laborer is then pressed into service. At the same time the rice mills begin operations and the farmers have some difficulty in keeping hands. From $1.25 to $1.75 a day is paid to unskilled laborers at the present time. Laborers hired by the year receive $15 to $18 a month, with board.

There are five species of rice known to the botanist, but of these we have to deal with only two in Louisiana, the common rice (*Oryza sativa*) and red rice (*Oryza rufipogon*). To the former species belong the cultivated varieties, while the latter may be classed as a very noxious weed. The varieties of common rice which have found favor in Acadia Parish are the Honduras and the Japan. The Japan has been recently introduced into this country and has become the favorite with the farmers of this section. The grain of this variety is shorter and thicker than that of the Honduras and has a thin hull. The proportion of bran and polish is smaller, and the milling qualities are excellent.

The price of rice is determined entirely by its appearance. The whole grains bring from 1 to 3 cents a pound more than the same quality of rice slightly broken. The kernels must also be hard enough to take a high polish. The price, therefore, depends upon the milling qualities of the rice rather than upon its nutritive value; hence it will be seen how important a matter to the farmer is the selection of good seed and the cultivation and curing of the grain.

The by-products of rice culture are of considerable value, but too little use is made of them. They are the straw, hulls, bran, and polish. The straw is usually burned in the fields, which is a great waste on the part of the farmer, as it is eaten by cattle in preference to ordinary hay, and seems to have an equal food value. The hulls have little value as food. The bran and polish contain the most nutritious part of the rice, and have a high feeding value, but they are in concentrated form, and should be mixed with fodders to get the best results.

Red rice is the worst pest with which the Acadia planter has to deal. In food value there is little difference between the white rice and the red, but the presence of even a few grains of the red is sufficient to greatly depreciate the market value. It spreads rapidly, and is very persistent, being more hardy than the white. The only remedy seems to be to plant pure seed, and to practice a rotation of crops wherever possible.

Besides rice, cotton is the only crop of any importance in Acadia Parish. This crop will produce well without fertilizers on nearly all

lands of the parish, and if the present high prices continue, a constant increase in the acreage may be expected.

The corn grown here is said to have a superior feeding value, but not enough is produced to supply home needs.

Shipping facilities are furnished to the farmers of Acadia Parish by the Southern Pacific Railroad. The main line traverses the area from east to west, and the Gueydan and Eunice branch line from north to south. A few miles east of Acadia Parish another branch of the same road extends northeastward from Lafayette, and furnishes transportation for the cotton of the northeastern part of the parish.

Acadia Parish has a large mileage of public roads. On the newly settled prairie the roads have been laid off on the section lines, but in the older settlements the roads are not laid off with any order, nor with any regard for convenience. To keep up such zigzag roads as those leading out from Churchpoint is folly. Fortunately, there are few of this kind, and the people are beginning to realize the value of the time lost on every trip over those roads.

In seasons of moderate or no rainfall there is little cause for complaint of the public roads. The silt of the soil maintains a certain firmness, and prevents the sand from working up. In rainy seasons, however, or when the planters turn the water from the rice fields into the public roads, they become almost impassable. In the absence of road-building materials it seems impossible to keep the roads in perfect repair, but they may be kept serviceable by grading and drainage, and by providing some other outlet for irrigation waters.

When rice growing first began on a large scale along the Gulf coast, New Orleans was the only market for the disposal of the product. The farmer shipped to brokers, who either sold it rough or had it milled before it was put on the market. As the industry grew, more convenient methods of marketing nearer home were demanded, so that now several systems are at the option of the farmer. Of these the tolling system is the most popular. By this method the milling company acts as the selling agent. The farmer hauls his rice to the mill, where it is cleaned and polished. It is then turned over to the clean rice man, who grades it and gives samples to the traveling salesmen or agents of the mill, who sell it to the best advantage. For these services the farmer pays the following charges: The cost of milling is 40 cents per barrel of 162 pounds of rough rice; 3½ per cent is deducted from the amount of sales for brokerage and commission; 8 cents apiece is charged for the sacks and packets in which the rice is sold; and insurance charges are sometimes added for insurance on the grain while it is stored in the mill or warehouse. This makes the total cost to the farmer of milling and marketing about 60 cents a barrel.

A simpler and quicker method is for the grower to sell his rough rice outright to the mills or to speculators.

There are 10 mills in Crowley and a total of 18 within the limits of Acadia Parish in which rice is cleaned and sold. In addition there are large warehouses for the storage of the grain, and brokers and buyers of every description. Crowley has become one of the most important rice markets of the United States and claims to be the largest market for rice at first hand, for much of the Crowley rice is rehandled at New Orleans and other markets.

Other agricultural products find a market at Crowley, but they are sold to the farmers and not by them. Practically all the horses and mules used on the rice farms are brought in and distributed from Crowley. Large quantities of corn and feed stuffs are sold to the rice growers. Poultry, eggs, and dairy products are not supplied by the farmers, notwithstanding the remunerative prices that prevail.

The cotton markets of the parish are Rayne and Churchpoint. The latter point, though not located on a railroad, does a good business in ginning and buying cotton. The nearest point for shipping this cotton is Sunset, about 6 miles distant, on the Southern Pacific Railroad.

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