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Soil Survey

of

Beauregard Parish, Louisiana

By

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Bureau of Chemistry and Soils

In cooperation with the
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SOIL SURVEY OF BEAUREGARD PARISH, LOUISIANA

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PARISH SURVEYED

Beauregard Parish is in the southwestern part of Louisiana. (Fig. 1.) Its southern boundary is about 45 miles north of the Gulf of Mexico, and its western boundary is formed by the west bank of Sabine River which separates this part of Louisiana from Texas. The parish is irregularly rectangular in shape and covers an area of 1,172 square miles, or 750,080 acres.

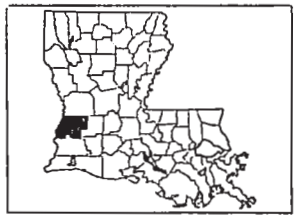

FIGURE 1.—Sketch map showing location of Beauregard Parish, La.

The parish is part of a nearly level or gently undulating plain which consists of a series of benches, progressively higher in elevation from the southern part of the parish northward and from Sabine River eastward. The southern borders of these benches are south of Turps, south of Fulton, and south of Longville, respectively. The benches range in elevation from 26 feet, where the Texas & New Orleans Railroad crosses the southern boundary of the parish, to 210 feet at De Ridder in the north-central part. Each bench has a gentle slope to the south, and there is generally a well-defined step-like rise to the next higher terrace to the north. The land slopes very gently westward from De Ridder to a point near Neale, where the elevation is 186 feet above sea level, then drops almost 100 feet a mile, to a Sabine River terrace.

The southern part of the parish is flat and is drained by streams flowing through shallow valleys lying from about 5 to 10 feet below the level of the surrounding country. To the north the stream valleys are deeper, the surface is more undulating, and surface drainage is better. In general the areas near the streams in the northern part of the parish have a greater degree of slope and are gently rolling, but at a distance from the larger streams the land is flatter. A narrow strip of upland on the south side of Bayou L'Anacoco is gently rolling. Along the border of the Sabine River bottom in the southwestern part of the parish the land is cut by narrow gullies extending out from the bottom.

The Sabine River bottom is a flat area with little relief except traces of abandoned meanders and channels of small tributary streams. It is submerged for a month or more almost every winter, but it is seldom flooded during the summer.

Only a comparatively narrow strip, from 2 to 8 miles wide, in the western part of the parish is drained by tributaries of Sabine River. The rest of the parish is drained by creeks that form part of the

Calcasieu River system. The main creeks of this system flow in a general southeast direction but diverge rather than approach each other in the southern part of the parish. The smaller branches form a network that extends to all sections, but the drainage system is not complete, as the region is geologically so young that a complete drainage system has not had time to develop. There are extensive flat areas between the streams where excess surface water flows off sheetlike or stands until it seeps into the soil or evaporates.

A heavy stand of longleaf pine (*Pinus palustris*), with very little underbrush, formerly covered most of the uplands except a small area of natural prairie in the southeast part of the parish and the depressions known as baygalls or May-haw ponds. More or less post oak and blackjack oak occupy the heavy plastic soils, such as those of the Susquehanna series, and some sand jack occurs on the deep sandy areas. The longleaf pine is coming back on protected areas, but most of the region is almost barren of timber, owing to destruction of the young trees by hogs and fire.

The well-drained terraces are largely covered with longleaf and loblolly pine (*Pinus taeda*), mixed with hardwoods and shrubs such as sweetgum, chinquapin, dogwood, sumac, buckeye, honeysuckle, red oak, black-jack oak, and hickory. The most common grasses are broom sedge and other grasses of the Andropogon genus. There is considerable carpet grass on the grazed areas and Lespedeza on areas protected from fire.

The alluvial lands are covered with hardwoods of many kinds, with a thick growth of underbrush on the cut-over areas. There are a few loblolly and longleaf pines on the better-drained areas. Among the common trees and shrubs on the heavy clay alluvial land are red gum, white oak, overcup oak, cow oak, water oak, pin oak, live oak, black gum, cypress, sycamore, ash, elm, maple, magnolia, hickory, sweetbay, sweet laurel, dogwood, French mulberry, ironwood, holly, hornbeam, possum haw, May haw, sweetfern, wild cherry, grapevine, blackberry, and huckleberry. Tupelo gums grow on the wetter areas. More than one-half of the timber cut has been red gum, followed in quantity by white oak, red oak, cypress, and sycamore. Many trees of the virgin forest were from 2 to more than 4 feet in diameter.

About the same species of trees grow on the silt loam alluvial soils, but the trees are somewhat smaller and the stand is thicker. There is not so much red gum but more holly, sycamore, maple, sweetbay, sweetgum, ironwood, and other small trees. Some beech grows on the silt loams. Most of the trees and shrubs growing on the clay alluvial soils grow on the sandy soils also but in different proportions. Beech is one of the most common trees on the sandy soils, whereas it is very scarce on the clay soils. On the sandy soils there are also more magnolia, sweetbay, sycamore, black gum, longleaf pine, shortleaf pine (*Pinus echinata*), loblolly pine, hickory, ash, maple, sweet laurel, blackhaw, blackberry, and other shrubs and small trees. Some yaupon grows on the sandy areas.

Very little grass grows on the alluvial lands, but the canebrakes furnish grazing on areas that have not been overgrazed.

Beauregard Parish is part of the territory acquired by the Louisiana Purchase in 1803. Sabine River was the western boundary of the United States from 1803 until after the Mexican War. During that

time there was considerable travel, across the area now included in the parish to the old Starks Landing south of Merryville, into Mexico.

Permanent settlers came into the region shortly before the Civil War. They were largely descendants of Scotch-Irish and some of English people who had originally settled in the Carolinas and had gradually pushed westward through Georgia, Alabama, and Mississippi into Louisiana. Only a few people of French descent came in from the French settlements to the south. Less than 10 per cent of the farm population are negroes. In the southwest part of the parish is an old settlement in which the people are of mixed Indian ancestry.

The population increased gradually until 1896 when the first railway, the Kansas City Southern, was built into the area. This started the sawmill industry and was followed by a considerable influx of population. The parish was organized from Calcasieu Parish in 1913. De Ridder is the parish seat and the main trading point. Hardwood mills are located at De Ridder, Merryville, and Longville, and there is a mill for sawing pine at Merryville. A number of mill centers and logging camps were formerly scattered over the parish but most of them were moved to other points after the pine timber was cut. Railway stations and small stores remain to take care of the farming trade.

At present the main cash crops are largely shipped to outside markets. Cotton is shipped to New Orleans, Galveston, Lake Charles, and other terminal markets. Sweetpotatoes and truck crops were formerly sold mainly in local markets to people employed in the lumber industry, but they are now shipped to Kansas City and the northern markets. Satsuma oranges and other fruits have been sold in local markets in the surrounding region to the north, but any great increase in production will necessitate shipping them to northern markets in the future. Wool is shipped east. Sheep and range cattle are shipped to Kansas City and other packing centers.

The Kansas City Southern Railway and the Texas & New Orleans Railroad cross the central part of the parish from north to south. The Gulf, Colorado & Santa Fe Railway crosses the northwest part and the New Orleans, Texas & Mexico Railway crosses the southeast part. Only in the extreme eastern and western parts is the distance to a railway greater than 10 miles. The main roads between the towns are graveled. The earth roads in the settled districts are fairly good as the sandy soil makes a good natural road where it is drained and protected from washing. Large undeveloped areas in the parish have no roads except here and there a meandering wood road.

CLIMATE

The climate of Beauregard Parish is mild and is characterized by long warm summers and short moist winters. The summer heat is tempered by the Gulf breezes, and most nights are comfortably cool. Freezing weather is rare during the winter, but occasionally a sudden drop in temperature occurs, due to the cold waves from the northwest accompanied by cold drizzling rains. Because of the long misty rainy spells and low evaporation the winters seem rather moist. Snow and ice are very rare. The summers seem fairly dry, even though the total precipitation is often higher than that of the winter, because the summer rains come as heavy showers followed

by dry cloudless weather. The rain is well distributed during the growing season, but now and then crops suffer from drought. Prolonged severe droughts are rare. The fall months are comparatively dry and therefore favorable for harvesting the crops. Hardy vegetables are grown throughout the winter.

The mean annual temperature is 67.2° F., and the lowest temperature recorded is 5°. The average date of the last killing frost is March 5 and of the first is November 19, giving an average frost-free period of 259 days, but killing frosts have occurred as late as March 30 and as early as October 29. The mean annual precipitation is between 55 and 60 inches. The wettest year on record, 1919, had a precipitation of 84.57 inches, and in the driest year, 1904, the rainfall amounted to 31.91 inches.

The data in Table 1, compiled from records of the Weather Bureau station at Tenmile, Allen Parish, is representative of climatic conditions in the northern part of Beauregard Parish. In the southern part of the parish the mean temperature and the minimum temperature are slightly higher because of the proximity to the Gulf of Mexico.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Tenmile, Allen Parish, La.* [1]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1904)	Total amount for the wettest year (1919)
	° F.	° F	° F	*Inches*	*Inches*	*Inches*
December	52 1	81	5	5 42	3 28	6.43
January	52 0	80	10	5 02	2 33	5 74
February	52.6	88	5	4 98	1 96	4 32
Winter	52. 2	88	5	15 42	7. 57	16 49
March	61. 5	86	22	4 53	2. 34	7 31
April	67 1	89	32	4 82	3 27	8. 06
May	74. 1	93	38	4. 58	2 71	7. 50
Spring	67 6	93	22	13 93	8 32	22 87
June	80 2	102	44	4. 12	2 43	8. 22
July	82 0	102	56	5 14	6 44	9 17
August	81 5	102	55	5 60	2 23	4 24
Summer	81 2	102	44	14 86	11. 10	21 63
September	77 6	99	46	3 80	2. 41	1 41
October	67 4	98	21	3 80	0	16. 12
November	58 5	86	23	4. 02	2 51	6. 05
Fall	67 8	99	21	11. 62	4 92	23. 58
Year	67 2	102	5	55 83	31. 91	84. 57

[1] Data prior to 1919 are for Sugartown, Beauregard Parish, about 8 miles northwest of Tenmile.

AGRICULTURE

Agriculture in Beauregard Parish has gone through the usual pioneer stage of this region of the United States. The earliest settlers lived largely by hunting. They kept some livestock on the open range but did little farming. The earliest white settlers came in

between 1814 and 1824, but there were few permanent settlers until about 1850. The usual farmstead consisted of a log cabin, a cowpen, and a small patch of cleared land where corn, cotton, sweetpotatoes, sugarcane for sirup, tobacco, and vegetables were grown for home use. Some of the cotton was grown as a cash crop. The cowpens were moved occasionally to help fertilize new plots of ground. The uplands were covered with longleaf pine, and an undergrowth of grass provided summer pasture. The bottoms were covered with hardwoods and a thick undergrowth of brush and cane. The canebrakes supplied fall and winter grazing, and the bottom-land forest supplied mast on which the hogs thrived. Sheep were raised, mainly for wool.

By 1890 good-sized settlements had been established at Sugartown and Merryville. Small patches of well-drained terrace or hammock land near the creeks were the first to be cleared. When these were occupied settlement spread to the better soils of the upland.

Cotton was hauled to Lake Charles and even as far as Alexandria and Lafayette. Steamboats later came up Sabine River. An increasing amount of timber was cut and floated down Sabine River, and smaller amounts were floated to Calcasieu River.

By 1890 the average farm included from 10 to 20 acres of cleared land and a complete set of farm buildings. Most farmers still earned a large share of their living by running cattle, hogs, and some sheep on the open range, farming only small plots of selected soils for a supplementary income. Cotton was grown as a cash crop, and truck and feed crops were grown for home use.

The coming of the railroads marked a period of industrial development. Big sawmills were built to exploit the forest of longleaf pine, and the sawmill towns provided good markets for food products.

The coming of the boll weevil about 1906 greatly reduced the yields of cotton and made cotton growing comparatively unprofitable. Many farmers spent part of their time working in the lumber camps and other public works during this time. Other crops were planted to take the place of cotton. The acreage in cotton had fallen to about its lowest in 1919 when the census reported 191 bales grown on 1,008 acres.

The only censuses taken of this parish since its separation from Calcasieu Parish are the Federal censuses of 1920, 1925, and 1930.[1] During the period between 1920 and 1925 the sawmills were beginning to close down and the operators were moving out of the region. The negro laborers especially moved out in large numbers. At the same time many farmers from the north were moving in and settling on the cut-over pine lands. Experiments made about this time showed that Satsuma oranges could be grown in the region. Methods had also been devised to combat the boll weevil, and there was a large increase in the production of cotton, reaching 1,529 bales on 4,319 acres in 1924. The acreage of many other crops decreased during the same period. That of corn dropped from 6,030 acres in 1919 to 5,122 acres in 1924, but in 1929 the acreage had increased to 7,414 acres. Sweetpotatoes were grown on 1,411 acres in 1929, an increase over previous census years.

It is estimated that since 1925 the cropped land has increased from about 2.2 per cent of the total area of the parish to 3.4 per cent in

[1] Soil survey reports are dated as of the year in which the field work was completed. Later census figures are given whenever possible. The 1930 census figures are subject to revision.

1930. The rest is largely cut-over pine land on the upland and hardwood forest on the bottoms. Most of the pine timber has been cut in recent years. The region is just emerging from a pioneer stage of farming and entering into a diversified or specialized type of farming, with the growing of Satsuma oranges and other fruits, early vegetables, and cotton as the most important cash crops. One carload of the 1928 crop of bright-leaf tobacco was shipped out of the parish. Soybeans have taken the place of velvetbeans and cowpeas to a large extent. About 400 acres of cucumbers produced a crop which sold for about $50,000 in 1927. Nearly half a million Satsuma orange trees were planted on about 3,500 acres between 1925 and 1928. The hay acreage was 1,510 acres in 1929, about twice the acreage reported in previous census years.

Commercial fertilizers are used on most farms. The census of 1925 reports an expenditure of $39,003 on 680 farms in 1924, or an average of $57.35 a farm. Complete fertilizers are most commonly used, and an increasing number of farmers are mixing their own. One of the most popular mixtures is 4–12–4.[2]

Most of the farm work is performed by the farmer and members of his family. The census of 1925 reports an average of $89.72 expended for labor in 1924 on 220 farms, leaving 787 farms with no labor charge. The census of 1920 reports an average expenditure of $134.93 a farm on 164 farms in 1919. The average wages for farm work are from $1 to $2 a day with board.

Most of the farms are between 20 and 100 acres in size, although many are much larger. The average size, according to preliminary reports from the 1930 census, is 71.2 acres. Only about 13 per cent of the total area of the parish is in farms. The rest is mainly cut-over land owned by lumber companies.

Of the 1,374 farms in the parish 1,039 are operated by owners, 319 by tenants, and 16 by managers. Most of the rented land is worked on the crop-share system.

The farm buildings, as in most regions having a warm climate, are rather unsubstantial, but a few are of good construction. The fences are very good. Good water is obtained from shallow wells, ranging from 25 to 50 feet in depth, or from springs.

About three-fourths of the work animals on the farms are horses and the rest are mules. Rather small animals weighing 1,000 pounds or less are preferred by most farmers. Many oxen are used for logging hardwoods in the Sabine River bottom.

Land values of cut-over stump land range from $5 an acre for poorly drained land distant from markets to $100[3] or more for land suitable for the production of Satsuma oranges near markets. The average value of the Ruston soils is about $25 an acre; that of the marginal farm land is about $15; and that of the soils classed as forestry land, including the Caddo and Susquehanna soils, is about $10. The same classes of land are worth from $10 to $25 more an acre when cleared. The average improved farm, which usually includes the three grades of land and is about 25 per cent cleared, sells at about $25 or $30 an acre. Highly improved land in bearing Satsuma orange or pecan groves is valued as high as $1,000 an acre.

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[2] Percentages, respectively, of nitrogen, phosphoric acid, and potash.

[3] Since 1928, land values have declined considerably. The figures given show comparative values, however, which have not changed in a marked degree.

Nearly all the farmers in the parish raise some cattle and hogs. One or two of the best cows are kept at home and the rest of the herd is allowed to forage on the open range during most of the year. During severe weather in late winter it is necessary to supply supplementary feed. There is no herd law in the parish and this has made the eradication of the cattle tick difficult. Improved mature breeding stock can not safely be shipped into the area to improve the native stock, but Brahman cattle from India, locally known as "buffaloes," have been used to increase the size of the animals and to make them more active, hardy, and more or less resistant to the cattle tick and other insects. Most of the range cattle are either shipped north for fattening or are sold to the packing plants as canners. Much beef is shipped into the area because of the coarse quality of the local meat. The 1925 farm census reports the total number of cattle as 10,747 with a valuation of $197,447. Most of the dairy cattle are grade Jerseys. The value of dairy products sold increased from $31,063 in 1919 to $45,652 in 1924 and is still increasing. A creamery and ice-cream factory at De Ridder furnish a market for milk.

Hogs have been improved by crossing the native razorbacks with Poland China, Hampshire, Duroc-Jersey, and other breeds. The number of purebred herds is increasing. Cholera has greatly reduced the number of razorback hogs in the woods. Hogs are usually butchered in the fall after they have been fattened on corn, sweetpotatoes, peanuts, and velvetbeans in the fields.

The census of 1925 reports 37,041 head of sheep, which produced 90,528 pounds of wool in 1924. Most of the sheep are allowed to forage on the open range throughout the year. They are owned mainly in large herds by men who specialize in sheep raising. Many of the sheepmen are crossing their sheep with a better grade of animal in order to increase the size and produce a heavier-shearing type. Some losses in sheep, especially among those kept on farms, are caused by stomach worms.

Many farmers keep a few common goats to butcher.

The value of poultry and eggs produced in 1924 was reported as $70,228. All farmers have a small flock of hens, and recently a number of farmers have specialized in chicken raising, as the mild climate seems very favorable to this industry. A commercial hatchery in De Ridder supplies baby chicks for the surrounding region. Purebred chickens, especially White Leghorns, are replacing the inferior birds. A good market has been built up for all poultry products.

Many farmers who are clearing land derive considerable income from the sale of pine stumps and fatwood to the naval-stores plant in De Quincy. The stumps are blown up with dynamite and cut to cordwood size before hauling or shipping to the mills. The "fattest" stumps, or those with the highest content of rosin and turpentine, are obtained from the rather poorly drained or crawfish land.

The cutting of pine piling, posts, and crossties for the creosoting plant near De Ridder furnishes an important source of revenue. Most farmers have received considerable income from the sale of timber to the sawmills. The growing of timber is becoming an important industry, and many farmers as well as the timber companies are now protecting cut-over land from fire and hogs.

Most of the crops in the parish are grown on ridges or "beds" about 4 feet apart, the land being plowed during the winter with a 1 or 2 horse plow. The usual depth of plowing is from 4 to 6 inches, as deep tillage or subsoiling has proved harmful rather than beneficial. The sandy character of the soils makes them easy to till. Fertilizers are applied by hand or with a fertilizer spreader about the time of planting. On well-drained land the seed may be planted in the water furrow, elsewhere it is planted on the ridges. Cultivation is done mainly with 1-horse implements, though a few farmers are beginning to use 2-horse cultivators.

Crop rotation is practiced to only a small extent, although the same crop is not commonly grown on the same plot year after year. A farmer is apt to select the most suitable soil, apply commercial fertilizer, and plant crops to supply his needs.

The same crops are grown on the different soils in the parish, but certain soils are locally recognized as being better than others for certain crops. Cotton is grown on the well-drained deep sandy soils where it matures quickly and to some extent escapes the boll weevil. Watermelons and cantaloupes are also grown on deep sandy soils. The heavier soils, having red or somewhat red subsoils, such as the Ochlockonee, Orangeburg, Ruston, and Cahaba soils, are preferred for corn.

Commercial fertilizers are used on all soils in the parish except in the Sabine River bottom. The census of 1925 reports an average expenditure of $57.36 a farm for fertilizer (including lime) in 1924 on the 680 farms reporting, which represented 67.5 per cent of the farms in the parish.

Chemical analyses made of soils in the parish [4] indicate that they contain nitrogen, phosphorus, and potassium in amounts comparable to those in most soils of the coastal plains. These are the most important elements of plant food in a soil. Roughly the amount of nitrogen in the topsoil, to a depth ranging from 4 to 8 inches, is about 5 or 6 per cent of the total nitrogen in the topsoil of the most fertile black prairie soils in the north. In cultivated areas, in the topsoil and subsoil combined, to a depth of about 40 inches, the content of nitrogen and phosphorus is about 30 per cent and of potassium about 10 or 15 per cent of that in the most fertile black prairie soils. The low content of nitrogen in the topsoil of the soils of this parish is due to the small amount of organic material present. These analyses confirm the past experience of farmers in the region that well-balanced fertilizers containing nitrogen, phosphoric acid, and potash are necessary to produce good crop yields.

Mixed fertilizers are commonly used, and the present tendency is to buy the several ingredients and mix them on the farm. For cotton one of the most effective fertilizers is a 4-12-4 mixture applied at the rate of about 200 or 300 pounds to the acre, though many farmers prefer to use superphosphate (acid phosphate) with cottonseed meal or other organic fertilizer for this crop. At least half the nitrogen for cotton should be organic.

The best farmers grow a crop of soybeans preceding cotton. By fertilizing the cotton heavily and cultivating it intensively to hasten

[4] Chemical analyses by A. P. Kerr, Louisiana State University, Baton Rouge, La.

maturity, and by poisoning the boll weevil, yields of a bale an acre have been produced. The production of cotton has been greatly increased during the last five years by employing improved methods of cultivation.

Stable manure is carefully conserved and is usually applied to the cornland. About 100 pounds of commercial fertilizer to the acre is used for corn in addition to the stable manure, and on upland soils an application of 300 pounds of commercial fertilizer is more profitable. Corn is planted between the last of February and the first of April. Flanagan, Hastings Prolific, Davis, and a flint variety known as Little Red Cob seem to be the most popular varieties. Some June corn is grown for a late crop. More yellow dent varieties are being grown by recent settlers from the North.

Oats are grown as a winter crop. Red Rustproof (Red Texas) is the most popular variety.

About 400 pounds to the acre of commercial fertilizer containing a high percentage of potash is required to grow a good crop of potatoes, a 4-12-6 mixture being satisfactory. Watermelons and cantaloupes also require a fertilizer high in potash. Potatoes are planted the last part of January and are harvested in May and June. Triumph is the most popular variety. Porto Rico and Nancy Hall are the favorite varieties of sweetpotatoes.

Some sugarcane was formerly grown for sirup by nearly all farmers. An excellent quality of sirup is produced here, but in recent years the cane worm and mosaic disease have been so destructive that the production of sirup has been unprofitable and the acreage planted to sugarcane has decreased. Disease-resistant varieties are being tried and may help revive the sugar industry in time.

No experiment stations have been established in Louisiana for the purpose of studying the best methods of fertilizing and managing the soils of Beauregard Parish. The most progressive farmers, however, are making an intensive study of the crop adaptations of different soils and of the best methods of fertilization and soil management. A special study is being made of fruits, especially Satsuma oranges. More than 400 varieties of fruits, nuts, and grapes are being tested on one farm west of De Ridder.

Satsuma orange and grapefruit trees are budded on hardy trifoliate rootstock, and are planted from 15 to 20 feet apart in the row. They should be cultivated intensively and fertilized moderately well the first part of the season but should not be cultivated or fertilized after July in order that the wood may thoroughly mature and become resistant to frost. The cost of fertilizer for bearing trees is about $25 an acre, which is somewhat less than the cost of fertilizer for round oranges in California and Florida.

Pecan trees are planted from 45 to 60 feet apart. They are often planted with Satsuma orange trees, as the oranges come into bearing at 3 or 4 years of age and the pecans at 10 or 15 years. The oranges furnish an income while the pecans are maturing, and the pecans remain in case the oranges are killed by frost. The greatest enemy of the pecan tree is the June bug, which may partly defoliate the trees in the late spring. June bugs cause less damage to trees planted near the hardwood swamps as they eat the leaves of the other hardwoods instead of the pecans. Pecans require heavy fertilization in order to produce good crops. Barnyard manure is especially beneficial. Manure or

nitrogeneous fertilizer should be applied every year and phosphate and potash fertilizer in alternate years.

Although much of the land in the parish is so flat that drainage is a problem, the best farm lands are subject to erosion. The Orangeburg and Ruston soils especially are well drained and have loose friable surface soils and subsoils that seem to melt away in the rain. They need very careful terracing even on gentle slopes. Most farmers are aware of the danger of soil washing and have taken some steps to guard against it. Nearly all plowing is done on the contour system and not up and down the slopes. Many good terraces have been built, but much more careful terracing is necessary. Nearly all the upland soils should be carefully terraced into broad beds correctly laid out with a level. The more rolling areas would require intensive terracing before they could be farmed. Areas having a slope varying from 8 to 30 or more per cent should remain in timber.

There is much room for agricultural development in Beauregard Parish. The present outlook is that the cultivated area, which now comprises about 3.4 per cent of the parish will be increased until it includes the best farm land, or about 20 per cent of the parish. A large part of the uncleared land is suitable for the common crops of the region, but the soil must be fertilized and built up to make it productive.

SOILS AND CROPS

Beauregard Parish consists essentially of a level or gently rolling plain imperfectly dissected by shallow valleys. The upland covers about 86 per cent of the parish and the bottom land the rest. The soils of the upland are mainly very fine sandy loams or fine sandy loams, and a few areas of silt loam occur in the southeast part of the parish. Differences in drainage and in the character of the parent material from which the soils have been derived have caused the development of a large number of soil types. Each has a definite, characteristic soil profile differing from any other. They vary in color, texture, and structure of the surface soil and the subsoil. For agricultural purposes, however, they naturally fall into a few groups the soils of which are similar in agricultural value. On this basis they have been grouped into (1) general-farming upland soils, (2) general-farming first-bottom soils, (3) rice-land soils, (4) marginal farm-land soils (5) forestry soils of the uplands and terraces, and (6) forestry soils of the first bottoms. They are so classified in the light of present knowledge of productivity and economic conditions. Soils classed as general-farming land produce fair yields of the common crops of the region. Soils classed as marginal land are not so productive as those of the general-farming groups. Soils classed as forestry land are not necessarily nonagricultural, but at present they are considered more valuable for growing timber than farm crops. When the demand for farm land becomes greater, special crops or methods of farming may be discovered which will make some of them valuable farm lands.

The soils of these groups are intricately mixed, each soil occurring in small bodies scattered over the parish. There are, however, belts in which the general-farming upland soils predominate. A larger proportion of the better farm lands are in the northern part of the

parish in a belt between Merryville, De Ridder, and Sugartown, with scattered areas elsewhere.

A general discussion of each group of soils, followed by descriptions of the soil types in the group, is given in the following pages of this report. The distribution of the soils is shown on the accompanying soil map, and Table 2 gives the acreage and proportionate extent of the soils mapped.

TABLE 2.—*Acreage and proportionate extent of the soils mapped in Beauregard Parish, La.*

Type of soil	Acres	Per cent	Type of soil	Acres	Per cent
Ruston fine sandy loam	47,040	6.3	Caddo very fine sandy loam	152,384	20.3
Ruston fine sandy loam, deep phase	5,120	.7	Plummer very fine sandy loam	59,200	7.9
Orangeburg fine sandy loam	5,376	.7	Plummer silt loam, poorly drained phase	10,752	1.4
Orangeburg fine sandy loam, deep phase	1,472	.2	Plummer silt loam, prairie phase	1,408	.2
Cahaba fine sandy loam	6,976	.9	Myatt very fine sandy loam	20,032	2.7
Cahaba fine sandy loam, deep phase	4,864	.6	Acadia silt loam	3,712	.5
Norfolk very fine sandy loam	60,736	8.1	Beauregard very fine sandy loam, poorly drained phase	10,624	1.4
Norfolk fine sandy loam, deep phase	4,288	.6	Susquehanna very fine sandy loam	35,072	4.7
Kalmia fine sandy loam	13,504	1.8	Susquehanna very fine sandy loam, heavy-textured phase	1,920	.3
Kalmia fine sand	5,056	.7	Leaf very fine sandy loam	3,968	.5
Kalmia very fine sandy loam, mottled-subsoil phase	12,160	1.6	Bibb silt loam	22,720	3.0
Ochlockonee clay	29,696	3.9	Bibb very fine sandy loam	16,640	2.2
Ochlockonee silt loam	21,952	2.9	Thompson fine sandy loam	7,232	1.0
Ochlockonee very fine sandy loam	22,400	3.0	Thompson fine sandy loam, light-textured phase	2,816	.4
Crowley silt loam	960	.1	Ochlockonee clay, dark-colored phase	384	.1
Lake Charles silty clay loam, light-colored phase	512	.1	Gravel pits	64	.1
Beauregard very fine sandy loam	75,328	10.0	Total	750,080	
Bowie very fine sandy loam	75,904	10.1			
Ruston fine sandy loam, compact-subsoil phase	7,808	1.0			

GENERAL-FARMING UPLAND SOILS

The general-farming upland soils have dominated the agriculture of Beauregard Parish in the past and probably will in the future, owing to their adaptation to the most profitable crops, such as fruits, early vegetables, cotton, and corn.

The soils of this group, which includes those of the Ruston, Orangeburg, Norfolk, Cahaba, and Kalmia series, all have fine sandy clay or very fine sandy clay subsoils. The subsoils are very friable, of good structure, and have no compact layer or hardpan to obstruct the plant roots or to prevent the internal movement of moisture. The soils crush easily when handled. They are permeable and retentive of moisture and retain fertilizers well. Being well drained, they favor the growth of microorganisms. On some of the areas mapped as deep phases of the fine sandy loams, the friable clay subsoils are so deep as to give the soils lower water-holding capacity than typical soils of the group.

These soils are not so rich in plant food as soils of the prairies to the north or the Mississippi Valley alluvial soils. One disadvantage of a warm moist climate is that the plant food is gradually leached out of well-drained soils. The plant food, however, can be replenished by using commercial fertilizers. These soils are not suitable for cereal crops that prefer a dark rich heavy soil, but when properly fertilized are well adapted to the most common crops of this region such as

cotton, sweetpotatoes, early vegetables, peanuts, pecans, bright-leaf tobacco, and fruits such as Satsuma oranges, oriental persimmons, peaches, and Pineapple pears.

The Orangeburg, Cahaba, Ruston, and Kalmia fine sandy loams, Norfolk very fine sandy loam, and Kalmia very fine sandy loam, mottled-subsoil phase, rank in natural productiveness in the order named. The areas mapped as the deep phases of the fine sandy loams, or as the fine sands of the various series are not well suited to the ordinary farm crops but are better adapted to sand-loving crops such as peanuts, watermelons, cantaloupes, and, to some extent, cotton.

The relative acreages of different crops and the average yields on the soils of this group correspond closely to those of the parish as a whole except that a larger percentage of the cultivated area of these soils is planted to Satsuma oranges and other fruit trees. At present (1928) about 35 per cent of their cultivated area is planted to corn, 25 per cent to cotton, and 15 per cent to Satsuma oranges and other fruit trees.

The average yield of corn is between 12 and 14 bushels to the acre on the fine sandy loams of this group when from 100 to 200 pounds of commercial fertilizer is used, but yields of 50 bushels are often obtained on well-fertilized plots under favorable conditions. The yields on the Orangeburg soils are slightly higher and those on the Norfolk slightly lower than the average. The fine sands and the deep phases of the fine sandy loams are not so well adapted to corn.

Velvetbeans are planted with about 10 per cent of the corn in alternate rows as a forage crop and to enrich the land.

The average yield of cotton is about one-third bale to the acre, but yields as high as one bale to the acre have been obtained under the best farming methods. The sandy hammock land including Cahaba fine sandy loam, deep phase, Kalmia fine sandy loam, and Kalmia fine sand are the favorite cotton soils. The sandy soil induces early maturity which helps the cotton to escape the boll weevil.

Sweetpotatoes are produced on about 6 per cent of the cultivated area. They do well on most of the well-drained soils. The average yield is about 80 bushels and the maximum yield about 250 bushels to the acre. Potatoes average about 50 bushels to the acre, and maximum yields of 125 bushels have been obtained.

Cowpeas, soybeans, and Lespedeza are the main hay crops. The average yield of hay is between three-fourths and 1 ton to the acre. Some oats are cut for hay, and when threshed for grain they yield about 10 bushels to the acre.

Peanuts are grown on the more sandy soils, mainly for hogging off. Watermelons, cantaloupes, and other crops adapted to sandy soils, are grown largely on the deep phases of the fine sandy loams and on Kalmia fine sand.

The production of bright-leaf tobacco has just been started in the parish. The more sandy members of the Kalmia, Norfolk, and Ruston series, which have yellow or reddish-yellow subsoils, produce the best quality of bright-leaf tobacco, but soils with bright-red subsoils do not produce so good a quality of leaf.

Sugarcane does best on the slightly moist heavier soils. Yields are now very low, due to the cane worm and mosaic disease.

Early vegetables and truck crops are grown on a large variety of soils. Cahaba fine sandy loam and its deep phase are the best truck

soils in the parish. The deeper soil is especially adapted to cantaloupes and watermelons. Early vegetables, such as cabbage, radishes, and turnips, do well on all the soils of this group.

Fruit trees rank just after corn and cotton in total acreage. It is estimated that 3,500 acres, or 15 per cent of the cultivated area is planted to fruit trees, pecans, and grapes. Fully 75 per cent of this is in Satsuma oranges (1928). Papershelled pecans and peaches rank next in importance and are followed by Pineapple pears, grapes, grapefruit, Japanese persimmons, and figs.

The planting of Satsuma orange trees was begun a short time ago and few of the trees have reached bearing age. The greatest handicap to the production of this fruit is the danger of temperatures below 18° F. during the winter. The weather records indicate that temperatures as low as 5° can be expected at rare intervals. Expensive precautions would be required to prevent the killing of the present varieties of Satsuma oranges at such temperatures. The occurrence of injurious frosts since this parish was surveyed has clearly indicated the danger to the industry from this source. The Orangeburg and Ruston fine sandy loams seem to be good soils for Satsuma oranges as the trees do best on well-drained soils with very friable fine sandy clay subsoils. The fine sandy loams are preferred to their deep phases. The Norfolk soils are somewhat less in demand for Satsuma oranges. The trees do well on the Cahaba and Kalmia soils, but many areas of these soils are on level stream terraces that have poor air drainage, and the trees may be killed by frost. The average yield of Satsuma oranges is about 500 boxes to the acre. One thousand oranges to the tree is the highest yield reported. The total production of oranges up to 1927 was about 10,000 boxes.

Grapefruit trees do well on the same soils as those on which Satsuma oranges thrive.

Peaches do best on well-drained sandy soils having red friable subsoils. The deep phases of the Orangeburg and Cahaba fine sandy loams seem to be the best peach soils, followed by the fine sandy loams. Peaches are grown on other soils where the Orangeburg and Cahaba soils are not available, but the trees are short lived. There are a few peach trees on nearly every farm.

Papershelled-pecan trees do well on all the general-farming upland soils, but they thrive best on the well-drained hammock land such as Cahaba fine sandy loam. Oriental persimmons also appear to thrive best on the Cahaba fine sandy loam, but they do well on the other general-farming upland soils.

Pineapple, or sand, pears and Kieffer pears appear to do well on moist soils having sandy clay subsoils.

Celeste, or blue, figs, if planted near buildings do rather well on most soils with sandy clay subsoils. The commercial Magnolia fig does not thrive here, as it requires well-drained soils, rich in lime, and no such soils occur in the parish.

Tung-oil trees are grown on Orangeburg fine sandy loam.

Ruston fine sandy loam.—Ruston fine sandy loam has a light grayish-brown fine sandy loam surface layer underlain by a brownish-yellow or pale-yellow thin subsurface layer. The subsoil is yellowish-red or reddish-yellow friable fine sandy clay and is free from mottling to a depth of 3 feet or more. At an average depth of about 10 feet the subsoil grades into a mottled yellow, red, and gray very fine sandy

clay with occasional layers of gray. A trace of fine ferruginous gravel may occur in the surface soil and subsoil in places. The subsoil is permeable to moisture and has good water-holding capacity, which makes this soil resistant to drought. Next to Orangeburg fine sandy loam this soil has the best physical structure of any upland soil in the parish.

Surface drainage and underdrainage are very good.

According to field tests, the topsoil ranges from slightly acid (pH 6) to moderately acid (pH 5) with an average of about pH 5.4. The subsoil averages slightly more acid.

In mapping, a few spots of Ruston very fine sandy loam and Ruston fine sand are included with Ruston fine sandy loam. A larger total acreage of Ruston fine sandy loam is cultivated than of any soil in the parish. There are other soils much more extensive but a lower percentage is cultivated.

Ruston fine sandy loam, deep phase.—In addition to typical Ruston fine sandy loam two phases were mapped in the parish, the deep phase and the compact subsoil phase. The deep phase differs from the typical soil chiefly in the depth and texture of the sandy surface layer, which is about 8 inches thick in the fine sandy loam and from 12 to 36 or more inches in the deep phase. Ruston fine sandy loam, compact-subsoil phase, is of lower agricultural value than the typical Ruston soil and is included with the group of marginal farm-land soils.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam has a light grayish-brown fine sandy loam surface layer and a thin reddish-brown or yellow subsurface layer of similar texture. Where cultivated the soil in many places has a faint red cast. The subsoil is bright-red very friable fine sandy clay to a depth of about 10 feet or more, where it becomes faintly streaked with yellow and a trace of gray. It is permeable to moisture and has high water-holding capacity. Plant roots penetrate it easily. It has no mottling or hardpan layer and probably has about the best physical structure of any soil in the southern part of the United States. The surface soil and subsoil are acid (pH 5 to pH 6) but less so than any other sandy upland soil of the parish.

Orangeburg fine sandy loam covers less than 1 per cent of the area of the parish, but it is an important farming soil as it produces the highest average yields of any of the upland soils in the parish. About 30 per cent of the land is now cultivated and this is a higher percentage than for any other upland soil in the parish.

The average yield of corn is about 15 bushels, with a maximum of 50 bushels to the acre; sweetpotatoes average about 90 bushels, with a maximum yield of 250 bushels; potatoes average 60 bushels, with a maximum yield of 125 bushels; cotton averages between one-third and one-half bale, with a maximum yield of 1 bale; and oats average between 1 and 15 bushels to the acre.

Orangeburg fine sandy loam, deep phase.—The deep phase of Orangeburg fine sandy loam is similar to the typical soil except that the upper soil layers are thicker and contain less fine earth.

Cahaba fine sandy loam.—Cahaba fine sandy loam is the terrace equivalent of Ruston fine sandy loam. The areas occur on terraces or high bottoms of Sabine River, Bayou L'Anacoco, and other streams

of the parish. Like the Ruston soil, the Cahaba soil has a yellowish-red or red friable subsoil. Thin layers of sand occur in some places in the lower part of the subsoil. The soil is entirely free from rock and gravel. It is slightly more acid than the Ruston and Orangeburg soils. The surface in most places is nearly level, but the open pervious subsoil insures good or fair natural drainage.

Cahaba fine sandy loam is locally known as hammock land because the natural forest consists of a mixed growth of longleaf pine, loblolly pine, hardwoods, and shrubs.

About 50 per cent of this soil is cultivated. That is a higher percentage than of any other soil in the parish. The agricultural use of this soil is described under the general discussion of the agriculture of this group of soils.

Cahaba fine sandy loam, deep phase.—Cahaba fine sandy loam, deep phase, differs from the typical soil in the greater thickness of the sandier surface soil layers and in having a smaller quantity of fine earth material in these upper layers.

Norfolk very fine sandy loam.—Norfolk very fine sandy loam has a light-brown friable very fine sandy loam surface layer, a pale-yellow thin subsurface layer of similar texture, and a yellow friable fine sandy clay or very fine sandy clay subsoil. A trace of iron oxide "gravel" occurs in some spots. The subsoil passes into mottled yellow, red, and gray friable very fine sandy clay at a depth ranging from 4 to more than 6 feet. Where the mottled substratum lies less than 36 inches below the surface the soil was classified with the Bowie or Beauregard series. Norfolk very fine sandy loam occurs in gently undulating or nearly level upland areas. Surface drainage is moderately good, but the water table is rather high in some areas.

Norfolk fine sandy loam, deep phase.—Norfolk fine sandy loam, deep phase, differs from Norfolk very fine sandy loam in having a somewhat higher percentage of fine quartz sand throughout and in the greater thickness of the yellow subsurface layer. The subsoil and substratum layers contain a smaller quantity of clay material and are more pervious, affording better internal drainage than in the finer-textured soil. Soil of this phase has a somewhat lower moisture capacity, and is slightly less fertile than Norfolk very fine sandy loam. Otherwise the agricultural possibilities of the two soils are similar.

Kalmia fine sandy loam.—Kalmia fine sandy loam consists of about a 12-inch surface layer of light grayish-brown loamy fine sand overlying yellow sandy clay.

This soil occurs on terraces and has fair or good surface drainage although the water table is rather high in some areas.

This soil in its natural state is covered with longleaf pine, shortleaf pine, and some hardwoods and shrubs. It is locally called "hammock soil" but is not typical hammock land. About 5 per cent of the land is cultivated. It is considered of higher agricultural value than the Norfolk soils, and the chemical analyses made indicate that it is slightly higher in plant food than those soils.

Kalmia fine sand.—Kalmia fine sand has a light grayish-brown loamy fine sand surface soil passing into pale-yellow fine sand which is underlain by sandy clay at a depth ranging from 14 to 80 inches. Some of the land has been cleared but much of it has been allowed to revert to timber. Much shortleaf pine grows on this soil.

Kalmia very fine sandy loam, mottled-subsoil phase.—Kalmia very fine sandy loam, mottled-subsoil phase, has a brownish-gray or light grayish-brown surface soil and a yellow, mottled with gray, very fine sandy clay subsoil. It differs from the other Kalmia soils in having a mottled subsoil, poorer drainage, finer texture, and in being suited to a smaller range of crops. It is well adapted to sweetpotatoes, Lespedeza, cucumbers, and blueberries.

GENERAL-FARMING FIRST-BOTTOM SOILS

The general-farming first-bottom soils are all included in one soil series, the Ochlockonee. These soils consist of recent stream deposits, and although subject to overflow by high flood waters, are sufficiently well drained to allow crop production on the more favorably located areas.

These are considered the most fertile soils in Beauregard Parish and will produce good crops without the use of commercial fertilizers. Corn and cotton are the main crops, corn being the main crop on Ochlockonee silt loam and on the better-drained areas of Ochlockonee clay. Ochlockonee silt loam is valued more highly for farming than the clay because it is easier to cultivate and nearly as productive. The average yields on the Ochlockonee soils are between 15 and 25 bushels of corn and between one-third and one-half bale of cotton to the acre without fertilizers. Cotton yielded as high as 1½ bales to the acre before the advent of the boll weevil. The better-drained areas are well adapted to vegetables. Pecans should do well.

All the bottom-land soils are very acid (pH 3.5 to pH 4.5). The better-drained areas should be well adapted to blueberries as these berries require an acid soil.

Ochlockonee clay.—Ochlockonee clay has a rich-brown slightly mottled clay surface soil and a mottled brown, gray, yellow, and limonite-yellow clay subsoil. As in most bottom lands of the parish the subsoil is generally similar in texture to the surface soil. The deeper subsoil is more or less stratified. Of the Ochlockonee soils the Ochlockonee clay covers the largest area. It is mapped only in the Sabine River bottom. The soil is rather sticky when wet but is fairly granular and friable when dry. Due to its fine texture, it is a rather heavy soil to cultivate.

Ochlockonee silt loam.—Ochlockonee silt loam occurs on first-bottom lands which are somewhat higher and better drained than the areas of Ochlockonee clay. The surface soil to a depth of 6 or 8 inches is brown or grayish-brown smooth friable silt loam. The subsoil in most places is mottled brown, yellow, and gray silty clay or silt loam, but the texture is variable, and in many places the subsoil consists of stratified or laminated clays, silts, and fine sands. Like Ochlockonee clay, the silt loam is subject to overflow, but favorably situated areas may be cultivated, and, in favorable seasons, produce good yields. The soil is fertile, drains more freely, and is more easily worked than Ochlockonee clay.

This soil is extensive and occurs in the stream bottoms of the parish. The largest areas are along Bundick Creek.

Ochlockonee very fine sandy loam.—Ochlockonee very fine sandy loam is largely a very fine sandy loam but a few areas of fine sandy loam and of fine sand are included in mapping, owing to their small

extent. This soil occurs mainly on the bottoms of the smaller streams. Most of the included areas of fine sand are in secs. 14 and 27, T. 3 S., R. 12 W., northwest of Merryville, and in sec. 26, T. 2 S., R. 12 W., south of the mouth of Bayou L'Anacoco.

RICE-LAND SOILS

Crowley silt loam and Lake Charles silty clay loam, light-colored phase, may be regarded as a northward extension of the coastal-prairie rice lands, which lie to the south of Beauregard Parish. Their importance in this parish is very limited owing to their small total area.

Crowley silt loam.—Crowley silt loam consists of gray silt loam passing into mottled gray and yellow silty clay containing many concretionary gravel and underlain by mottled yellow, gray, or bluish-gray, and red friable and granular silty clay. Surface drainage is fairly good. The substratum is not calcareous to a depth of more than 6 feet.

This soil occurs only in the southeast corner of the parish where 960 acres are mapped. About 10 per cent of its total area is cultivated. The cultivated land is used for growing rice in Allen Parish, which adjoins Beauregard Parish on the east. Most upland soils in this region having mottled subsoils are compact and unproductive, but Crowley silt loam is an exception, and it produces good yields of the crops ordinarily grown.

The Crowley soil in this parish differs from the more typical Crowley soils to the southeast in having a less brown and more gray surface soil and in its greater depth to the lime-bearing substratum. It is covered with a sparse growth of pine, whereas the typical areas in other sections are in prairie.

Lake Charles silty clay loam, light-colored phase.—Lake Charles silty clay loam, light-colored phase, has a dark-brown surface soil, a gray mottled subsoil, and a calcareous substratum containing many lime nodules. This soil is a natural prairie rather than a timbered soil. Only a few small bodies, including a total area of less than 1 square mile, are mapped. The largest body is on a stream bottom in the southeast part of the parish, and much of it was at one time used for growing rice under irrigation, but rice growing has been abandoned owing to the difficulty of controlling the flood waters. This area now supports a heavy growth of grass for pasture. A smaller body, which is southeast of De Quincy, occupies a depression and is used only for pasture.

MARGINAL FARM-LAND SOILS

This group of soils includes Beauregard very fine sandy loam, Bowie very fine sandy loam, and Ruston fine sandy loam, compact-subsoil phase. These soils are of lower agricultural value than the general-farming soils. Ruston fine sandy loam, compact-subsoil phase, has fairly good drainage, Bowie very fine sandy loam has fair drainage, and Beauregard very fine sandy loam has fair or somewhat deficient drainage. All the soils of this group are acid in reaction (pH 4.5 to pH 5).

The marginal farm-land soils are used mainly for corn, cotton, sweetpotatoes, Lespedeza, other hay crops, vegetables, sugarcane,

and oats. The average yields of corn and cotton are lower than on the general-farming upland soils. The marginal farm-land soils are not well adapted to Satsuma oranges and peaches on account of the less pervious character of the subsoils. The Bowie and Beauregard soils are well adapted to Pineapple pears. Sugarcane and oats thrive as well and Lespedeza, strawberries, and blueberries do better than on the general-farming upland soils.

Beauregard very fine sandy loam.—Beauregard very fine sandy loam has a light grayish-brown surface soil and a mottled yellow, red, and gray rather dense, somewhat plastic very fine sandy clay or silty clay subsoil. The subsoil bakes hard when dry, consequently plant roots do not penetrate it easily.

This soil occurs in areas of undulating or gently rolling relief. Surface drainage is fairly good but underdrainage is deficient. Beauregard very fine sandy loam is closely associated with the Bowie and Caddo soils. Many areas mapped as Bowie soil in the northern part of the parish might more accurately have been mapped as Beauregard. This soil differs from the Bowie soils in having a more gray, more plastic, and slightly less well-drained subsoil, and it is of lower agricultural value. Crawfish chimneys are not so common as on the Caddo soils. Traces of surface mounds about a foot high and 40 feet wide are in evidence, but they are not so conspicuous as on the Caddo soils.

A few areas in the southeast part of the parish having a silt loam surface soil are included with Beauregard very fine sandy loam in mapping.

This soil occupies 10 per cent of the area of the parish. About 2 per cent of the total area of the soil is cultivated.

A poorly drained phase of this soil is included with the group of forestry soils and is described with those soils.

Bowie very fine sandy loam.—Bowie very fine sandy loam has a light grayish-brown surface soil, a yellow very fine sandy clay upper subsoil layer, and a yellow, mottled with red, slightly compact lower subsoil layer. The surface is undulating or gently rolling. Surface drainage is fairly good but underdrainage is somewhat deficient. There are very few crawfish chimneys on this soil.

Like most upland soils with mottled subsoils in this region Bowie very fine sandy loam is not so productive as the soils in which the subsoils have a solid color. In this region a mottled subsoil is an indication of restricted internal drainage and the mottling is generally associated with more or less compaction. Restricted internal drainage causes poor aeration and deficiency in the bacterial life that helps to make the fertility of a soil available.

This soil produces very good crops of sweetpotatoes and fair crops of early vegetables. Pineapple pears and blueberries do very well. Pecans and Satsuma oranges do fairly well on the better-drained areas but not so well as on the Ruston and Orangeburg soils.

Ruston fine sandy loam, compact-subsoil phase.—Ruston fine sandy loam, compact-subsoil phase, has a light grayish-brown surface soil, and a yellowish-red firm but friable subsoil more or less streaked with red and yellow and containing considerable brown ferruginous concretionary "gravel."

Only a few small areas of this soil are mapped. The land is well drained but little of it is cultivated. In general appearance it is much

like typical Ruston fine sandy loam but is not so productive, owing to the less pervious character of the subsoil. The denser subsoil layer is especially detrimental to fruit trees as it hinders the development of a good root system.

FORESTRY SOILS OF THE UPLANDS AND TERRACES

The forestry soils of the uplands and terraces include about two-fifths of the total area of Beauregard Parish. These lands are in general imperfectly drained or poorly drained, due to impervious subsoils, a nearly flat surface, or both, and they are unsuited to the production of ordinary cultivated farm crops. Under present conditions they seem best adapted to forestry, although they have considerable present use for pasture. A very small total area is cultivated. Of this soil group, the most important soil type is Caddo very fine sandy loam, which includes a total area of 238.1 square miles, or 20.3 per cent of the area of the parish.

Caddo very fine sandy loam.—Caddo very fine sandy loam has a light brownish-gray very fine sandy loam surface soil and a mottled yellow and gray compact subsoil with more or less red mottling below a depth of about 35 inches. The nearly flat surface is marked by a great number of mounds, set closely together, ranging from a few inches to about 2 feet in height and being about 40 feet in diameter. On the mounds there is a subsurface layer of pale-yellow loamy very fine sand extending to a depth of about 24 inches. Between the mounds, the yellow layer is not present and the gray very fine sandy loam surface soil extends to a depth of 6 or 8 inches where it passes into mottled very fine sandy clay. On the mounds the soil resembles Norfolk loamy fine sand, and between the mounds the subsoil may be mottled gray like that of the Plummer soils. A highly acid somewhat indurated layer generally occurs at a depth of about 28 inches. A few small areas south of Ragley, having a silt loam surface soil and a very fine sandy clay or silty clay subsoil, are included with this soil in mapping.

A distinguishing feature of the Caddo soil as well as of other poorly drained upland soils of the parish is the large number of dead pine trees or pine stumps present on cut-over land, locally known as "deadening," and also the large number of shallow-rooted pine trees that have been blown over.

Surface drainage is poor. Water may stand between the mounds for a short time after heavy rains, and it runs off sheetlike to the nearest depressions or drains. Much of the rain apparently disappears by sinking into the soil. The water table is high during the wet winter season and is rather low during the summer. The subsoil is soggy when wet and bakes hard when dry. The Caddo soil is locally considered a typical crawfish soil, so called because of the large number of crawfish chimneys on the surface.

Probably 2 per cent of the total area of Caddo very fine sandy loam has been cleared and cultivated but more than half of the cleared areas have been abandoned. The soil is adapted to a very narrow range of crops and at present is considered more valuable for growing pine timber in connection with grazing than for farming. It is especially adapted to strawberries, being considered one of the best strawberry soils in the region, but because of the limited demand for

strawberries and the market competition with established strawberry-producing districts only a small part, if any, of the soil could be profitably used for this crop. Lespedeza is well adapted to this soil, sweetpotatoes grow well but are apt to rot in the fall, and Pineapple pears do fairly well. Pecans will grow where the soil is well drained and highly fertilized, but they do not thrive so well as on the Cahaba, Orangeburg, or Ruston soils. The Caddo soil produces poor crops of cotton and corn, but the yield of winter oats is about the average for the parish.

Plummer very fine sandy loam.—Plummer very fine sandy loam has a gray very fine sandy loam surface soil and a gray very fine sandy clay subsoil mottled with more or less yellow and traces of red. The subsoil is slushy when wet and very hard and compact when dry. It is usually wet in the winter and very dry during the summer.

This soil occurs on very flat or depressionlike areas where water stands for several days after heavy rains during the winter. Some of the rain overflows into near-by drains, but much of it remains to sink into the soil or to disappear by evaporation. Crawfish chimneys are common on this soil, and it is locally called crawfish soil.

Plummer very fine sandy loam occupies nearly 8 per cent of the total area of the parish. Practically none of the land has ever been cleared, and most of the cleared areas have been abandoned. This is classed as a forestry soil as it is better adapted to producing pine trees, which grow rapidly, than to farming. Strawberries can be grown if the land is drained, but the market is limited for such a special crop. Rice might be grown where water can be obtained for irrigation. At present the soil can not compete with the coastal-prairie soils as an agricultural soil because of the cost of clearing and irrigating the land. Probably much more commercial fertilizer would be required on this soil than on the more fertile coastal-prairie soils to produce equal crops.

Plummer silt loam, poorly drained phase.—Plummer silt loam, poorly drained phase, has a grayish-brown or bluish-gray silty surface soil and a mottled gray silty clay subsoil. In many places a gray impervious layer, which remains dry and powdery even when the surface is covered with water, occurs at a depth of about 30 inches. Water stands on this soil for long periods after rains.

Soil of this phase occurs in shallow depressions on the ridges, locally called baygalls. It is the only upland soil covered with hardwood timber. The timber consists largely of bay, May haw, oak, and gum, whereas that on the other upland soils is mainly longleaf pine. None of the land has been cleared or cultivated. Very little timber has been cut, as most of the trees are rather small for saw logs. Some of the trees have been cut for stove wood. Sweetbay wood burns without smoke and is highly prized for firewood. The annual crop of native May-haw berries is the most valuable product of this soil at the present time.

Plummer silt loam, prairie phase.—Plummer silt loam, prairie phase, has a gray silt loam surface soil and a gray or bluish-gray silty clay subsoil more or less mottled with yellow, limonite yellow, and red. The soil is slushy when wet and very hard when dry. In most places, where it is surrounded by coastal-plain soils, it is noncalcareous to a depth of 5 feet or more. Within the belt of silt loam soils associated

with the coastal prairie in the southeast part of the parish, it may have a calcareous substratum at a depth ranging from 4 to 5 feet.

Plummer silt loam, prairie phase, is a light-colored treeless upland soil which occurs in scattered shallow depressions, locally known as "buffalo wallows," in the southern half of the parish. None of the land is farmed, as it is poorly drained and naturally unproductive. Its only value at present is for grazing.

Myatt very fine sandy loam.—Myatt very fine sandy loam is the terrace equivalent of Plummer very fine sandy loam. It has a gray very fine sandy loam surface soil and a gray or bluish-gray mottled silty clay subsoil. The areas are rather poorly drained and are more or less unproductive. Practically none of the land is cleared, and less than 1 per cent of the total area of the soil is cultivated. The soil is well adapted to the production of pine timber.

Acadia silt loam.—Acadia silt loam resembles Myatt very fine sandy loam in profile, but it has a calcareous substratum beginning at a depth ranging from 2 to 5 feet. Lime concretions about 6 inches long and generally of a peculiar dumb-bell shape occur in the lower part of the subsoil. This soil occurs only in the southeast part of the parish on low terracelike areas, associated with the coastal-prairie soils which lie to the south of Beauregard Parish. None of it is farmed, but it is covered with a thin scattered growth of longleaf pine. Surface drainage ranges from fair to poor.

Beauregard very fine sandy loam, poorly drained phase.—Beauregard very fine sandy loam, poorly drained phase, has a surface layer, from 1 to 3 inches thick, consisting of dark-brown silt loam or very fine sandy loam mixed with partly decayed organic material or leaf mold. It is rather dark when moist but turns gray when dry. This material grades into brownish-gray silt loam or very fine sandy loam which is underlain by yellowish-gray very fine sandy clay or silty clay mottled with limonite yellow, gray, and red. The subsoil has a somewhat shotlike or granular structure even though it is very poorly drained. The substratum contains no lime to a depth of 6 feet or more.

The areas of this soil have a rather flat surface. Mounds are common, but they are not so conspicuous as on the Caddo soil. Crawfish chimneys are scattered over most of this soil but are not quite so common as on the Caddo soil.

None of this soil is cultivated. At present it seems to be more valuable for the production of timber than for farming.

Susquehanna very fine sandy loam.—Susquehanna very fine sandy loam has a light grayish-brown very fine sandy loam surface layer about 4 inches thick, underlain by a yellow very fine sandy clay subsurface layer extending to a depth of about 12 inches, and a mottled yellow, gray, and red raw stiff plastic clay subsoil.

Most of this soil occurs in undulating or gently rolling areas, and surface drainage is good but underdrainage is poor. A few areas in the southwest part of the parish are somewhat broken.

This soil occupies a total area of 54.8 square miles, less than 1 per cent of which is cultivated. The subsoil is raw, unweathered, sterile, and so plastic that plant roots do not penetrate it easily, and it is also rather impervious to water.

The Susquehanna soils are locally known as "jointed clay lands" or "post-oak land." They are not productive farming soils and are

better adapted to growing pine timber than to farming. Bermuda grass makes good pasture, but it is not popular here as it is too apt to become a pest. Pecans do fairly well but not nearly so well as on the Ruston and related soils.

Susquehanna very fine sandy loam, heavy-textured phase.—The heavy-textured phase of Susquehanna very fine sandy loam is similar in soil profile to the typical soil except that the surface layer consists of silt loam rather than very fine sandy loam. The characteristic feature of the Susquehanna soils, the very heavy plastic subsoil layer, is as marked in the heavy-textured phase as in the typical soil. In general the surface relief is undulating. The total area of this heavy soil is 3 square miles.

Leaf very fine sandy loam.—Leaf very fine sandy loam is the terrace equivalent of Susquehanna very fine sandy loam. It has a slightly shallower surface soil and a more gray subsoil than the Susquehanna soil. Thin layers of sand and gravel occur in the substratum. The areas of this soil just southwest of Merryville have a red stiff clay subsoil.

Most of the areas of Leaf very fine sandy loam occur on the low terraces or second bottoms of Sabine River and are in general poorly drained. The areas having red subsoils are better drained.

Very little of this soil is farmed. It is covered with second-growth pine, post oak, and blackjack oak and is locally known as "post-oak land."

FORESTRY SOILS OF THE FIRST BOTTOMS

The forestry soils of the first bottoms consist of stratified alluvial material that may vary considerably within short distances, and for that reason they have no definite soil profile. Soil material is still being deposited with the recurring floods, and the surface soils may change from time to time. The material has been very slightly modified by weathering. In general, the areas on the natural levees near the streams are of coarser material and are better drained. The areas at some distance from the streams are more poorly drained and of finer texture.

The different types of alluvial soils have subsoils that are somewhat similar in color as they are all developed under comparatively poor drainage. The subsoils are predominantly gray, variously mottled with bluish gray, yellow, limonite yellow, red, and brown. The soils of this group were differentiated largely on the difference in the topsoils. These first-bottom soils are rather conspicuously marked by a heavy growth of hardwood timber and underbrush. The underbrush in many places consists of a dense growth of briers and vines that form a jungle hard to penetrate, especially along the smaller streams.

This group of soils, which includes the Bibb and Thompson soils and Ochlockonee clay, dark-colored phase, occupies about 7 per cent of the total area of the parish. Practically none of the land is cultivated.

Bibb silt loam.—Bibb silt loam has a light-gray silt loam surface soil and a gray or bluish-gray silty clay subsoil. The areas are usually wet and soggy most of the year, and crawfish chimneys are common.

Bibb silt loam occupies most of the bottom of Bearhead Creek, and it occurs in smaller areas along Sabine River and other streams. None

of the land is cultivated. It is naturally unproductive even when drained and is more valuable for the production of hardwood timber than for farming. The hardwoods are being cut for lumber.

Bibb very fine sandy loam.—Bibb very fine sandy loam is similar to Bibb silt loam, except in having a slightly lighter-textured surface soil which consists largely of very fine sand and fine sand grains. This sandier type of Bibb soil occurs chiefly along the smaller streams of the parish.

Thompson fine sandy loam.—Thompson fine sandy loam has a grayish-brown or brownish-gray fine sandy loam surface soil and a yellow and gray mottled subsoil of similar texture. This soil occurs most commonly along the swifter small streams and on natural levees in the Sabine River bottom. None of the land is cultivated at present, and many of the areas are too sandy to ever become productive farm land. Drainage would be expensive since most of the areas occur along narrow bottoms where a large ditch would be required to drain a narrow strip of land. This soil is more valuable for the production of timber than for farming.

Thompson fine sandy loam, light-textured phase.—Thompson fine sandy loam, light-textured phase, resembles the typical soil in color profile. It includes a few areas of fine sand or very sandy soils. Very few trees grow on it. The soil material is valuable for plaster sand and might be of value in industries, but it has no present agricultural value.

Ochlockonee clay, dark-colored phase.—Ochlockonee clay, dark-colored phase, has a waxy dark-brown surface soil and a bluish-gray or gray heavy clay subsoil. This dark soil differs from typical Ochlockonee clay only in its somewhat darker surface soil. The soil is sticky when wet but crumbly when dry. The areas are flooded during high water but are dry most of the time. This soil is heavily timbered with hardwoods, and an unusual number of wild cherry trees grow on it. None of the land is now farmed, but it should be a productive soil if cultivated, being especially adapted to potatoes. Only two small bodies, with a combined area of about one-half square mile, occur in the Bearhead Creek bottom.

SOILS AND THEIR INTERPRETATION

The soils of Beauregard Parish are classed in the broad category of the soils of the world known as the red and yellow soils. They are representative of a region having a warm humid climate where the soil remains moist and unfrozen during the winter.

The parish is within the broad physiographic division known as the coastal plain and consists largely of a level or undulating sandy upland cut by numerous shallow bottoms. The relief is very youthful as the land has been elevated above sea level so recently that there has not been time for the streams to cut back to the flatwood areas. The northern part of the parish is the highest and most rolling. The land slopes gently to the south and becomes gradually lower, flatter, and more poorly drained toward the southern border of the parish. Four irregular belts of soils, extending in an east-and-west direction, have been developed from the northern to the southern part of the parish. The soils of each belt may be grouped together, and the soils that do not occur in systematic belts constitute two other groups. These groups

are as follows: (1) soils with friable sandy clay subsoils, (2) soils with mottled slightly compact but not indurated subsoils, (3) soils with indurated hardpan sandy clay subsoils, (4) soils with friable silty clay subsoils, (5) soils with plastic clay subsoils, and (6) alluvial soils or stratified alluvium. This grouping differs from that in the chapter on Soils and Crops. It is based on soil characteristics, and the previous grouping was based primarily on crop adaptations.

The soils of the first belt in the northern part of the parish are largely developed under good drainage. This belt is roughly a crescent-shaped body east and west of De Ridder, with points extending southward along the Sabine River bottom on the west and southeastward along Dry Creek to the east boundary of the parish. It includes large areas of Ruston, Orangeburg, Norfolk, Cahaba, and Kalmia soils. Other soils also occur, especially in the more poorly drained areas, and soils belonging to this group occur in scattered areas in other parts of the parish, mostly on well-drained slopes near the larger stream bottoms. Soils of this group include about 20 per cent of the area of the parish, and most of the cultivated land is composed of these soils.

The second group includes soils developed under somewhat poorer drainage than those of the first group. The Beauregard and Bowie soils and the compact-subsoil phase of Ruston fine sandy loam are included in this group which covers about 21 per cent of the parish. These soils are most extensive in a belt extending east and west across the central part of the parish. The belt projects northward on the more poorly drained areas away from the streams and southward on the better-drained areas near the streams.

The soils of the third group have developed under fair or poor surface drainage and poor underdrainage. This group includes the Caddo, Plummer, and Myatt soils which constitute the most extensive group of soils in the parish, covering about 32 per cent of the total area. They predominate in the southern part of the parish, but scattered bodies occur in all parts.

The soils of the first three groups are apparently derived from similar sandy clay parent material. They have developed into different soils largely because of differences in drainage conditions. The length of weathering has had much influence on soil development in this parish, owing to the fact that the upland soils are developed on a series of marine terraces which are progressively older and higher to the north. Soils in the northern part of the parish have had more time to develop mature soil profiles. Indications are that a larger amount of iron in the parent material has helped to develop redder subsoils in some areas.

Soils of the fourth group occupy a belt that extends across the southeast corner of the parish. This belt consists of low, flat marine terraces bordering the coastal-prairie region to the southeast. They are comparatively young soils whose surface soils have probably not been weathered long enough to be eluviated to very fine sandy loam. This group includes the Lake Charles, Acadia, and Crowley soils, the poorly drained phase of Beauregard very fine sandy loam, and the prairie phase of Plummer silt loam. The group comprises about 2 per cent of the parish.

The soils of the fifth group include Susquehanna very fine sandy loam, with a heavy-textured phase, and Leaf very fine sandy loam.

A few small patches of Oktibbeha soils were included with the Susquehanna soils because of their small extent. The soils of this group occur in scattered areas in different parts of the parish, being most extensive on a ridgelike belt parallel to the Sabine River bottom, on a ridgelike area extending east and west from Longville, and in scattered areas on slopes near Bundick Creek and Whiskey Chitto.

These soils have developed from stiff intractable clay parent material instead of the sandy clay from which soils of the first three groups have developed. Most areas have good surface drainage but poor underdrainage.

The total area of soils in this group includes about 5 per cent of the parish.

The sixth group of soils includes the alluvial bottom land, where the soil material has been so recently deposited that it has not had time to develop a soil profile. The largest belt is along Sabine River, and narrow belts extend up the smaller streams. The Ochlockonee, Bibb, and Thompson soils are classed in this group which comprises about 16 per cent of the parish. The soils range in texture from heavy clay to sand, the texture being determined by the gradient of the stream. Fine sand is deposited along the swift streams and clay along the sluggish streams. The soils along the Sabine River bottom are mostly heavy clay, since that stream has a very low gradient. The soils along Beckwith Creek and Hickory Branch are largely fine sand. These streams flow rather directly south into Calcasieu River and have a high gradient and swift current. The soils along Bearhead Creek, Bundick Creek, and Whiskey Chitto are largely silt loam. These streams meander for a greater distance before they reach Calcasieu River and have a moderate gradient which has favored the deposition of fine silt.

All the alluvial soils have more or less mottled subsoils. They were classified largely on color and texture of the surface soil. Ochlockonee very fine sandy loam and Ocholocknee silt loam have rich-brown surface soils and gray mottled with yellow, limonite-yellow, and brown subsoils. Ochlockonee clay, dark-colored phase, has a dark-brown or black surface soil and mottled bluish-gray subsoil. The Bibb soils have gray surface soils and mottled bluish-gray subsoils. The Thompson soils have light grayish-brown surface soils and yellow, very slightly mottled, subsoils.

The alluvial bottom soils are described in more detail in the chapter on Soils and Crops.

All the land in this parish was originally forested, except the Lake Charles soil and the prairie phase of Plummer silt loam, which were covered with grass. The uplands were covered with longleaf pine, except the poorly drained phase of Plummer silt loam, which was covered with hardwoods. Like most forested soils in all parts of the world, the soils of Beauregard Parish contain little organic material and are light colored. The Lake Charles soil, like most grass or prairie soils, has a high percentage of organic material and is dark colored. The prairie phase of the Plummer silt loam is covered with a very thin growth of grass and is not dark colored.

The alluvial bottom soils are all covered with hardwood timber. The color of the bottom soils depends on drainage and the source of the soil material.

The texture of the surface soil on the uplands of this region depends largely on the degree of eluviation the soil has undergone. Four classes of sandy soils based entirely on texture are mapped in the parish. These are very fine sandy loam, fine sandy loam, deep phase of fine sandy loam, and fine sand.

The areas mapped as very fine sandy loam on the uplands have a topsoil, or A horizon, consisting of a mixture of even-textured very fine sand and fine sand, in which the very fine sand predominates and enough silt is present to give the material a smooth feel to an average depth of 6 or 8 inches. The areas mapped as fine sandy loam are similar except that the fine sand predominates and extends to an average depth of 8 or 10 inches, or to a maximun depth of 15 inches. The areas mapped as fine sandy loam, deep phase, are somewhat coarser textured and deeper, being loamy fine sand to an average depth of about 24 inches, or to a maximum depth of about 6 feet.

All the soils in Beauregard Parish are acid except in some areas in the southeast corner. In these areas the subsoil is alkaline in places. In other parts of the parish the reddest and best-drained soils are the least acid, and the grayest and most poorly drained soils are the most acid. There is a greater variation in the acidity of the subsoil and the substratum than of the topsoil. Table 3 gives the mean pH values of all samples of the A, B, and C horizons of different soils in Beauregard Parish.

TABLE 3.—*Mean pH value of A, B, and C horizons of soils in Beauregard Parish, La.*

Soil	pH	Soil	pH
Orangeburg fine sandy loam	5 44	Plummer very fine sandy loam	3 42
Ruston fine sandy loam	5 15	Plummer silt loam, poorly drained phase	4. 14
Norfolk very fine sandy loam	4. 99	Beauregard very fine sandy loam, poorly drained phase	4. 20
Ruston fine sandy loam, compact-subsoil phase	4. 70	Crowley silt loam	4. 83
Bowie very fine sandy loam	4. 07	Plummer silt loam, prairie phase	5. 13
Beauregard very fine sandy loam	4. 93	Lake Charles silty clay loam, light-colored phase	5. 70
Caddo very fine sandy loam	4. 56	Acadia silt loam	7. 00
Susquehanna very fine sandy loam	4 84		
Leaf very fine sandy loam	4. 67		

The Ruston soils are the most representative of the first group of soils, or the group having friable subsoils developed under good drainage. This group represents the normal mature soil having a fully developed profile.

A description of a profile of Ruston fine sandy loam observed on the NE. ¼ sec. 20, T. 5 S., R. 10 W., about a mile east of Gustin, follows: The A_1 horizon, to a depth of 2½ inches, consists of single-grained medium fine sandy loam or loamy fine sand containing a high percentage of very fine sand and some silt. Between 2½ and 5 inches is a transitional layer of pale grayish-yellow fine sandy loam or loamy fine sand containing infiltrations of darker material along root channels and worm casts and containing many specks of charred material. The A_2 horizon, between depths of 5 and 12 inches, is pale-yellow loamy fine sand or fine sandy loam composed of a mixture of fine sand, very fine sand, and enough silt to make the material sticky when moist. A faint sprinkling of yellowish-red that increases with depth appears in this layer, which also contains a trace of very brown ferruginous

concretionary gravel from about one-eighth to one-fourth inch in diameter. The upper subsoil layer, or B_1 horizon, between depths of 12 and 30 inches, consists of yellowish-red fine sandy clay which is very friable and vesicular and crumbles easily. It contains a few fine ferruginous concretionary gravel ranging from about one-eighth to one-fourth inch in diameter. These gravel, which are soft and crush easily, are somewhat spherical in shape and have a yellowish-brown very slightly pitted surface and a dark-brown or purplish-brown rather hard core. The soil in this layer takes a good polish on a cut plane and shows about the same color on a cut as on a broken surface. Many fine root hairs extend downward into this layer, and many fine capillary tubelike openings remain along former root channels. The lower subsoil layer, or B_2 horizon, lying between depths of 30 and 50 inches, is very similar to the layer above except that it is more yellow in color and contains no root hairs. The C_1 horizon, between depths of 50 and 80 inches, consists of reddish-yellow friable very fine sandy clay finely mottled with gray and containing many specks of limonite yellow. The clay stands up with a rather rough surface in a bank.

The profile described is of an area of virgin cut-over land that has been frequently burned over. A paper-thin film of gray sand is visible on the surface after rains. In forested areas a layer of leaf-mold about one-fourth inch thick generally covers the surface. In cultivated areas the surface soil is mixed so as to give the material a brownish-gray color.

This profile is representative of the Ruston soils throughout the parish except that the A horizon is slightly deeper and the B horizon is slightly redder than in the average Ruston fine sandy loam. The average depth of the A_1 and A_2 horizons in Ruston fine sandy loam is about 9 inches and ranges from 5 to 14 inches.

A trace of fine ferruginous gravel occurs in the surface soil and subsoil of many areas of the Ruston soils, but this is not a typical feature. The gravel are so small and scarce that they are not noticed by the average observer. Some areas of Norfolk and Orangeburg soils also contain traces of gravel, but most areas of these soils are rather free from gravel. The Cahaba and Kalmia soils are free from gravel.

The Norfolk soils resemble the Ruston soils except that the upper subsoil layers are yellow instead of yellowish red or reddish yellow and that the mottled substratum is shallower than in the Ruston soils, generally occurring at a depth ranging from about 4 to 6 feet.

The Orangeburg soils have bright-red extremely friable subsoils which are free from mottling to a depth of 10 feet or more. They resemble the Ruston soils except that they have redder more friable subsoils. They stand up in a smooth wall in ditch banks. Thin almost imperceptible yellow veinlike streaks in fish-net pattern occur in the Orangeburg soils at a depth ranging from 30 to 50 or more inches.

The Cahaba soils are the terrace equivalents of the Ruston and Orangeburg soils. They have yellowish-red or red very friable fine sandy clay subsoils similar to those of the Ruston soils, but the profile is not so well developed. In many places layers of fine sand occur in the lower part of the subsoil.

The Kalmia soils are the terrace equivalents of the Norfolk soils. They have yellow friable fine sandy clay subsoils. Many areas of

Kalmia soils are on low terraces where the water table is high. The mottled-subsoil phase of Kalmia very fine sandy loam has a mottled subsoil that closely resembles the subsoils of the Caddo soils but is not compact or indurated like those of the Caddo soils.

The Beauregard soils are the most representative of the second group of soils which includes Beauregard and Bowie soils and the compact-subsoil phase of Ruston fine sandy loam.

Following is a description of a profile of Beauregard very fine sandy loam observed in the NE. ¼ sec. 18, T. 5 S., R. 11 W.: The A_1 horizon, to a depth of 2½ inches, consists of dark-gray even-textured mellow very fine sandy loam containing considerable organic matter and many brownish-gray worm casts. The color becomes lighter with depth, grading into pale yellowish gray. Between depths of 2½ and 6 inches is the A_2 horizon of pale grayish-yellow rather silty very fine sandy loam containing scattered reddish-brown stains and specks of charred organic matter. This layer becomes heavier and yellower with depth and grades into the B_1 horizon consisting of yellow and gray, mottled with red, silty very fine sandy clay which breaks up into irregular sharp angular lumps. The red mottles, which contain many brown incipient ferruginous concretions, are slightly more resistant to erosion than the rest of the material and are very noticeable in cuts along the roadside. The gray material shows greater variations in texture and has a slightly lower pH value than the red material. The yellow color becomes less conspicuous and the gray and red become more conspicuous with depth. The soil in this layer is slightly plastic when wet, is compact but crumbly when moderately dry, and bakes hard when dry. Clay balls composed of bunches of shotlike red granules are common in this layer. Between depths of 15 and 40 inches is the B_2 horizon consisting of mottled gray, yellow, and red silty clay or very fine sandy clay. The material is predominantly gray with lumps and tubelike streaks of red surrounded by pale yellow. Yellow and red become the dominant colors when the soil is pulverized. The red mottles, which contain soft ferric oxide concretions, are more friable than the gray mottles, but they are more resistant to erosion. The C_1 horizon, between depths of 40 and 70 inches, is light-gray very fine sandy clay mottled with yellow and containing many streaks and lumps of red and purplish red. The yellow decreases with depth. This layer contains scattered ferruginous concretions.

This profile, which occurs in an area of virgin cut-over pineland, shows a slightly heavier and less compact B horizon than much of the Beauregard very fine sandy loam in the parish. It is slightly more like the B horizon of the Susquehanna soils.

Bowie very fine sandy loam resembles Beauregard very fine sandy loam but has a more reddish-yellow, more highly oxidized B horizon and contains little gray mottling above a depth of 30 inches. The C horizons of these two soils are identical.

The compact-subsoil phase of Ruston fine sandy loam is much more highly weathered than is Beauregard very fine sandy loam. It has a more compact and less mottled subsoil and contains ferruginous gravel instead of incipient concretionary material. The B horizon is generally dull reddish-yellow compact fine sandy clay somewhat streaked with rust brown and containing considerable ferruginous

gravel. It resembles the B horizon of Ruston fine sandy loam but is compact instead of friable.

The Caddo soils are the most representative of the third group of soils, which includes the Caddo, Plummer, and Myatt soils.

The following is a description of a profile of Caddo very fine sandy loam occurring in the NE. ¼ NW. ¼ sec. 15, T. 7 S., R. 12 W., west of De Quincy: The upper 1-inch layer, or A_1 horizon, has a thin filmlike coating of whitish-yellow sand over dark grayish-brown very fine sandy loam containing many roots and scattered ferruginous concretionary pellets ranging from about one-eighth to one-fourth inch in diameter. Crawfish chimneys are very common on the surface. The A_2 horizon, extending to a depth of 3 inches, consists of grayish-brown mellow even-textured very fine sandy loam containing many root hairs and infiltrations of organic matter along the larger decayed roots. The A_3 horizon, between depths of 3 and 6 inches, is pale grayish-yellow very fine sandy loam containing some ferruginous gravel and many grass roots. Below this and extending to a depth of 24 inches is the B_1 horizon of mottled yellow and gray very fine sandy clay. A sprinkling of rust-yellow and limonite-yellow material occurs along root channels and cleavage planes, and there are also some specks of smoky gray, probably caused by worm casts. Fine tubelike holes caused by roots or worms are numerous. This layer contains a few hard dark-brown concretions and a great number of incipient concretions. The soil material breaks up readily to irregular lumps on slight pressure when moist, but is cemented and very compact when dry. The lower part of the layer is slightly heavier, contains more soft concretions, and is slightly adhesive. A cut surface takes a dull polish which is more pronounced on the yellow mottles than on the gray. Black and rust-red specks show on the cut surface. In the B_2 horizon, occurring between depths of 24 and 36 inches, the material is gray, mottled with dull yellow, very fine sandy clay which crushes easily when moist. This layer contains splotches or soft friable concretions which are yellow on the outside and grade to red on the inside. They become brighter red when crushed. Wormholes are numerous in this layer. The gray color increases and the splotches become more numerous with depth. The C_1 horizon, between depths of 36 and 48 inches, consists of gray very fine sandy clay splotched and streaked with dull red or rust red. The red material is more friable than the gray. The substratum in most places is gray very fine sandy clay, splotched with red and yellow, which extends from a depth of 4 to more than 10 feet.

The Caddo soils occur in areas including mounds, from 6 to 12 inches in height and from 20 to 40 feet in diameter, set closely together. The area having the profile described occurs in a depression. A profile of one of the mounds would show a light grayish-brown loamy fine sand A_1 horizon to a depth of about 6 inches, a pale-yellow loamy fine sand A_2 horizon to a depth of about 18 inches, and a subsoil similar to that on the depressed areas.

Plummer very fine sandy loam differs from the Caddo soils in having a grayer and more compact surface soil and subsoil. The surface soil is brownish gray, yellowish gray, or bluish gray and is rather dark when moist. The subsoil is predominantly gray, mottled with pale yellow and limonite yellow, very compact, very fine sandy clay which is more acid than the subsoils of the Caddo soils.

The Myatt soil has a gray surface soil and a mottled gray friable sandy clay subsoil. It is the terrace equivalent of the Plummer soils but does not have the compact indurated subsoil.

The fourth group of soils includes the Crowley, Lake Charles, and Acadia soils, the poorly drained phase of Beauregard very fine sandy loam, and the prairie phase of Plummer silt loam. These soils are similar in that they have silty surface soils and silty clay subsoils, but their profiles differ. All these soils occur in flat areas and have a somewhat sparse pine or grass cover. The Lake Charles, Acadia, and Crowley soils, and the poorly drained phase of Beauregard very fine sandy loam occupy a series of terraces and are higher and older in the order named, and they have reached different stages of development.

The Lake Charles soil is a prairie soil which occurs in depressed areas where the soil is often covered with shallow water after heavy rains. The surface soil, which is slightly acid, shows very little eluviation and has about the same texture as the subsoil which is about neutral below a depth of 3 feet.

The Acadia soil is slightly higher than the Lake Charles soil and has a slightly eluviated surface soil, but it has a calcareous substratum.

The Crowley soil is more weathered, and the free calcium carbonate has been leached out to a depth of about 10 feet. The surface soil and subsoil are only slightly acid, and both have a granular structure.

The poorly drained phase of Beauregard very fine sandy loam is the highest and oldest of this group of soils. It has been thoroughly leached and is highly acid to a depth of 10 feet or more. The surface soil is silt loam, and this indicates a comparatively young soil. The older more highly eluviated soils in the region have been eluviated to fine sandy loam.

The following is a description of a profile of Crowley silt loam in the NE. ¼ SE. ¼ sec. 35, T. 7 S., R. 8 W., about a mile northwest of the southeast corner of Beauregard Parish: To a depth of 4 inches is the A_1 horizon, the material of which is dark-gray faintly granular silt loam with a sprinkling of light-gray splotches and fine specks of limonite yellow. There are a few rust-brown stains along the root channels, and specks of dark organic material and some worm casts occur. The material assumes a lighter shade when pulverized. This is the layer of greatest root accumulation. Below this and extending to a depth of 11 inches is the A_2 horizon consisting of mottled yellowish-brown and brownish-gray smooth even-textured faintly granular silt loam with splotched stains of rust brown. The material appears slightly darker when pulverized. Very few root hairs occur in this layer, but there are numerous fine tubelike holes that may be holes left by decayed roots or worms. Worm casts are abundant. Owing to the fine holes, the soil appears very granular. It breaks, under considerable pressure, to rounded granular particles. The B_1 horizon, between depths of 11 and 26 inches, is gray silt loam with rust-yellow mottling and smoke-gray stains. It contains some dark stemlike remains of grass roots and many dark-brown rounded ferruginous concretionary gravel. The soil crushes very easily, and when crushed the yellow color predominates. The material has a floury, finely granular structure and is not sticky. In the B_2 horizon,

occurring between depths of 26 and 44 inches, the material is bluish-gray silty clay mottled with yellow and splotched with red, and containing a few dark-brown rounded ferruginous gravel. The soil breaks up into faintly granular particles when moist but becomes very hard when dry. A cut surface takes a dull polish. The red material occurs as assembled red specks which are more friable than the gray material and are more conspicuous when crushed. The C horizon to a depth of 90 inches consists of yellow and gray silty clay. The soil becomes gradually less acid to a depth of 90 inches, which indicates that it is probably underlain by calcareous material at a depth of about 15 feet.

This typical profile of Crowley silt loam is of a virgin cut-over area formerly covered with a sparse growth of longleaf pine. The surface drainage is good.

The Crowley soil mapped in this parish is older and more highly eluviated than the more typical Crowley soils farther south.

The Lake Charles soil differs from the Crowley soil in having a deep dark surface soil and a grayer more calcareous subsoil. It consists of dark-brown friable silty clay loam to a depth of about 14 inches in most places, but the soil ranges in texture from heavy silt loam to silty clay and extends to a depth of 28 inches in places. This material passes abruptly into bluish-gray silty clay mottled with yellow and limonite yellow. The subsoil in most places is slightly heavier than the surface soil and becomes lighter colored with depth. The surface soil and upper subsoil layer are neutral or moderately acid (pH 6.9 to 4.6). At a depth of about 50 inches the subsoil is light-gray silty clay mottled with limonite yellow and rust yellow. It is very dry, floury, compact, and acid (about pH 4.7). This layer is underlain by light-gray slightly acid or neutral (pH 6 to pH 7) silty clay.

The Acadia soil differs from the Crowley in having a layer in the subsoil, at a depth of about 30 inches, containing much dark-brown concretionary gravel about one-fourth inch in diameter, underlain by a bluish-gray layer containing lime nodules about 2 inches in diameter. The surface soil, or A_1 horizon, is light grayish-brown or brownish-gray silt loam. A mottled gray and yellow subsurface layer, extending to a depth of 3 or 4 feet is present in some places. The next layer is gray silt loam or silty clay containing many brownish-black ferruginous rounded concretionary gravel about one-fourth inch in diameter. This layer is about 6 inches thick. It is underlain by a yellowish-gray, mottled with yellowish red, calcareous layer, from 6 to 18 inches thick, containing soft lime concretions and hard lime nodules about 2 inches in diameter. This material is underlain by calcareous bluish-gray or blue silty clay or silty clay loam which, at a depth ranging from 6 to 10 feet, passes into less calcareous material.

The profile of Plummer silt loam, prairie phase, is essentially as follows: From 0 to 2 inches the A_1 horizon is grayish-brown coarse silt loam, dark when moist and light colored when dry. The A_2 horizon, extending from 2 to about 15 inches, is bluish-gray silt which contains specks of charred material and streaks of rust brown along old root channels. The B_1 horizon, between depths of 15 and about 40 inches, is very compact light bluish-gray silt loam containing many concretions with dark-brown or black centers and yellow crusts. The layer of maximum compaction lies at a depth of about 28 inches. This

layer is dry and powdery even when the surface is covered with water. It is underlain by a thin calcareous layer in the areas of this soil in the southern part of the parish but is acid in the small areas farther north.

Plummer silt loam, prairie phase, differs from the Crowley soil in having a more bluish-gray less friable surface soil and upper subsoil layer, in having a gray compact floury impervious layer at a depth of about 28 inches, and in having a more calcareous substratum below a depth of 40 inches in most areas.

This soil resembles the poorly drained phase of Plummer silt loam but it has a less brown surface soil and in most areas a more calcareous substratum below a depth of 40 inches. The prairie soil is typically developed under a sparse grass cover and the poorly drained soil under a hardwood vegetation.

The Susquehanna soils are representative of the fifth group of soils. This group includes Susquehanna very fine sandy loam, a heavy-textured phase of that soil, and Leaf very fine sandy loam.

A profile description of Susquehanna very fine sandy loam observed in the SE. ¼ SE. ¼ sec. 19, T. 2 S., R. 7 W., about 9 miles east of De Ridder, follows: The A_1 horizon to a depth of 2 inches is rather dark-brown very fine sandy loam containing a large number of roots. The surface is covered by a thin paperlike film of light-gray fine sand. The A_2 horizon, extending to a depth of 4 inches, consists of light grayish-brown fine sandy loam. The A_3 horizon, to a depth of 6 inches, is brownish-yellow very fine sandy loam containing much smoke-gray material, probably derived from worm casts, which gives the layer a somewhat granular appearance. This layer contains a smaller number of root hairs than the layer above and a few round ferruginous gravel about one-tenth inch in diameter. The A_4 horizon, between depths of 6 and 12 inches, is yellow friable very fine sandy clay considerably mottled with yellowish gray and containing traces of rust-yellow material. Dark smoke-gray material washed down from the layer above has accumulated in pockets throughout this layer. Below this and extending to a depth of 30 inches is the B_1 horizon which consists of mottled yellow and gray stiff plastic clay containing splotches of red and a few dark-brown ferruginous gravel about one-fifth inch in diameter. The yellow and gray colors are closely intermingled, whereas the red particles occur in segregated bunches. When this layer is cut with a spade, the red material smears over the cut surface giving it a somewhat red appearance. The material on a cut surface takes a bright polish and breaks up into nut-sized fragments. Between depths of 30 and 42 inches the material is mottled yellow and gray stiff plastic clay containing spots of red and a few small specks of dark purplish-brown material. The gray is somewhat blue in shade. The red appears to be caused by incipient concretionary segregated material which is somewhat floury and more friable than the gray and yellow material. The soil in this layer takes a bright polish when cut, and the red color is rather conspicuous on a polished surface. This layer is extremely hard to penetrate and is impervious to water. Below this and continuing to a depth of 54 inches is gray, mottled with rust yellow, stiff plastic clay containing a few small specks of more friable somewhat red material and a few brown round ferruginous concretionary gravel about three-eighths inch in diameter. The gray is of a blue shade

and becomes more conspicuous with depth. Similar plastic clay material occurs to a depth of 10 feet or more in near-by gullies.

This profile is representative of most of the Susquehanna very fine sandy loam in the parish. A few small areas having a fine sandy loam A horizon were included with the typical soil in mapping. In gullies in this type of soil in the southwest part of the parish the substratum is mottled yellow, gray, and red plastic clay, with here and there a gray layer, to a depth of about 50 feet, where it passes into brown or tan-colored extremely intractable clay containing much rotten limestone. A somewhat similar calcareous clay comes within 4 feet of the surface in an area of Susquehanna very fine sandy loam, heavy-textured phase, 2½ miles east of Longacre. The position of this calcareous substratum suggests that the soil may have been derived from weathered calcareous material. The heavy-textured phase is similar to the typical soil except that it has a silt loam A horizon.

The Leaf soil resembles the Susquehanna in having a plastic clay subsoil. The subsoil is more gray in most areas of the Leaf soil but more red in some areas where the soil is well oxidized.

SUMMARY

Beauregard Parish is in southwestern Louisiana. It comprises a total of 1,172 square miles, or 750,080 acres. It is essentially a nearly level sandy plain dissected by shallow stream bottoms.

Several railroads cross the parish, and most of the farms are within 10 miles of railway shipping points. The main roads are graveled, but in some parts of the parish there are no roads.

The climate is warm and moist, with a mean annual precipitation between 55 and 60 inches. Killing frosts are not common, and the temperature rarely falls below 18° F. during the winter.

The virgin pine timber has recently been cut on the uplands and the hardwood timber is being cut on the bottom lands. About 3.4 per cent of the total area of the parish is cultivated and the proportion of improved land is increasing rapidly. Corn and cotton have occupied the largest acreage and vegetables have furnished the largest income of any crops in recent years. Some hay crops, sweetpotatoes, potatoes, sugarcane, peanuts, and bright-leaf tobacco are grown.

Nearly half a million Satsuma orange trees and large numbers of peaches, pecans, sand pears, blueberries and other fruits have been planted in recent years.

The predominating soils on the uplands are very fine sandy loams, fine sandy loams, and scattered areas of fine sand. A few areas of silt loam occur in the southeast part of the parish. The alluvial soils are largely clay in the Sabine River bottom and very fine sandy loam and silt loam in the smaller stream bottoms.

The Ruston, Norfolk, Orangeburg, Cahaba, and Kalmia soils are the most important farming soils. They have light grayish-brown surface soils and red or yellow friable fine sandy clay subsoils. The Orangeburg, Ruston, and Norfolk soils occur on undulating or gently rolling uplands which were formerly covered with longleaf pine. The Cahaba and Kalmia soils occupy nearly level well-drained second bottoms covered with a hammock vegetation consisting of pine mixed with hardwoods.

The Bowie and Beauregard soils and the compact-subsoil phase of Ruston fine sandy loam have rather compact subsoils and are of somewhat lower agricultural value. The areas are undulating or gently rolling.

The Caddo, Plummer, Myatt, and Acadia soils and the poorly drained phase of Beauregard very fine sandy loam are poorly drained soils having more or less mottled gray subsoils. They are more valuable for forestry and grazing than for farming at present.

The Susquehanna and Leaf soils are characterized by raw, plastic subsoils. They are best adapted to forestry.

The Lake Charles and Crowley are good rice soils. Lake Charles silty clay loam, light-colored phase, in this parish is a black poorly drained prairie soil.

Crowley silt loam has a well-drained light grayish-brown surface soil and a gray, mottled with yellow and red, silty clay subsoil.

The Ochlockonee, Bibb, and Thompson soils are alluvial bottom soils subject to flooding. Where protected from flooding the Och lockonee soils are good farming soils.

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