SOIL SURVEY

Alachua County Florida

Series 1940, No. 10

Issued February 1954

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with the
UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATION

How to Use THE SOIL SURVEY REPORT

FARMERS who have worked with their soils for a long time know the soil differences on their own farms, perhaps also on the farms of their immediate neighbors. What they do not know, unless soil surveys have been made, is how nearly their soils are like those on experiment stations or on other farms either in their State or other States where farmers have gained experience with new or different farming practices or farm enterprises. They do not know whether higher yields obtained by farmers in other parts of their county and State are from soils like theirs or from soils so different that they could not hope to get yields as high, even if they followed the same practices. One way for farmers to avoid some of the risk and uncertainty involved in trying new production methods and new varieties of plants is to learn what kinds of soil they have so that they can compare them with the soils on which new developments have proved successful.

SOILS OF A PARTICULAR FARM

The soil map is in the envelope inside the back cover. To find what soils are on any farm or other land, it is necessary first to locate this land on the map. This is easily done by finding the township in which the farm is located and by using landmarks such as roads, streams, villages, dwellings, and other features to locate the boundaries.

Each kind of soil mapped within the farm or tract is marked on the map with a symbol. For example, all the areas marked Go are Gainesville loamy fine sand, undulating phase. The color in which the soil area is shown on the map will be the same as the color indicated in the legend for that particular type of soil. If you want information on the Gainesville soil turn to the section in this publication on Soil Series, Types, and Phases and find Gainesville loamy fine sand, undulating phase. Under this heading you will find a statement of what the characteristics of this soil are, what the soil is mainly used for, and some of the uses to which it is suited.

Suppose, for instance, you wish to know how productive Gainesville loamy fine sand, undulating phase is? You will find it listed in the left-hand column of table 8. Opposite the name you can read the yields for different crops grown on the soil. This table also gives estimated yields for all the other soils mapped in the county.

If, in addition, you wish to know what uses and management practices are recommended for Gainesville loamy fine sand, undulating phase, read what is said about this soil in the section on Soil Series, Types, and Phases. Refer also to the section headed Land Use, Soil Management, and Estimated Yields, where the soils suited to the same use and management practices are grouped together. Read what is said about crops, liming, fertilizing, drainage, and other management practices on this group of soils. It will apply to Gainesville loamy fine sand, undulating phase.

SOILS OF THE COUNTY AS A WHOLE

A general idea of the soils of the county is given in the introductory part of the section on Soils of Alachua County, which tells about the principal kinds of soils in the county, where they are found, and how they are related to one another. After reading this section, study the soil map and notice how the different kinds of soils tend to be arranged in different parts of the county. These patterns are likely to be associated with well-recognized differences in type of farming, land use, and land-use problems.

A newcomer to the county, especially if he considers purchasing a farm, will want to know about the climate; the types and sizes of farms; the principal farm products and how they are marketed; the kind and condition of farm tenure; kinds of farm buildings, equipment, and machinery; churches, schools, roads, and railroads; the availability of electric services and water supplies; the industries of the county; and towns, villages, and population characteristics. Information about all these will be found in the sections on General Nature of the Area and on Agriculture.

Those interested in how the soils of the county were formed and how they are related to the great soil groups of the world should read the section on Morphology, Genesis, and Classification of Soils.

This publication on the soil survey of Alachua County, Fla., is a cooperative contribution from the —

SOIL CONSERVATION SERVICE

and

UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATION

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SOIL SURVEY OF ALACHUA COUNTY, FLORIDA

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United States Department of Agriculture in Cooperation with the University of Florida Agricultural Experiment Station

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[1] The Division of Soil Survey was transferred to the Soil Conservation Service on November 15, 1952.

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AGRICULTURE has been the chief occupation in Alachua County since its settlement. The Indians of the Alachua tribe of Seminoles had cattle and horses and were growing crops in 1774. The early white settlers had cattle and hogs on the open range and grew corn, rice, sweetpotatoes, and sugarcane for home use. After the opening of the Bellamy Road in 1826, Sea Island cotton, indigo, and cattle became important, but because of freezes, insects, and plant diseases, there have been many changes in crop production. Corn, peanuts, and velvetbeans are the principal subsistence crops, and peanuts, bright tobacco, potatoes, tung oil, pecans, watermelons, and vegetables, the main cash crops. The sale of hogs and cattle also brings considerable cash to farmers. The many kinds of soils under a favorable climate offer many advantages for a diversified agriculture. To learn the best agricultural uses of the land a cooperative soil survey of the county was made by the United States Department of Agriculture and the University of Florida Agricultural Experiment Station. Field work was completed in 1940, and, unless otherwise specifically mentioned, all statements in this report refer to conditions in the county at that time.

GENERAL NATURE OF THE AREA

LOCATION AND EXTENT

Alachua County is in the north-central part of peninsular Florida. Gainesville, the county seat, is 60 miles southwest of Jacksonville, 130 miles southeast of Tallahassee, and 295 miles northwest of Miami (fig. 1.) The county has a land area of 902 square miles, or 577,280 acres.

PHYSIOGRAPHY, RELIEF, DRAINAGE, AND VEGETATION

Physiographically, the county lies within the Floridian section of the Coastal Plain province.[1a] The entire county is underlain by Ocala limestone of the Eocene age, which outcrops locally and lies near the surface in the southwestern part. In the northeastern half of the county this formation is overlain by the Hawthorn (Miocene) formation, which in its unweathered state consists of sandy phosphatic limestone interstratified with sands and clays (*9*).[2] Along the western

[1a] FENNEMAN, N. M. PHYSIOGRAPHIC DIVISIONS OF THE UNITED STATES. (Map) U. S. Geol. Survey. 1930.

[2] Italic numbers in parentheses refer to Literature Cited, p. 65.

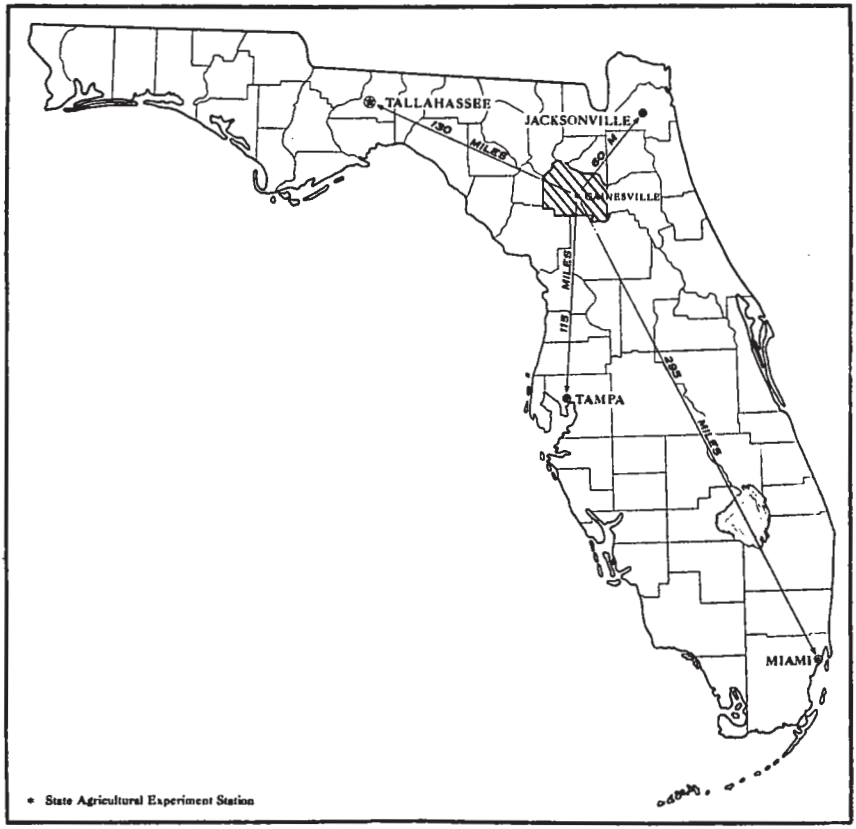

FIGURE 1.—Location of Alachua County in Florida.

edge hard rock phosphate, resulting from the weathering of the Hawthorn formation, lies near the surface and above or in cavities within the Ocala limestone. Most of the older formations are covered with the more recent sand and clay deposits that form the parent material of most of the soils in the county. In places in the central and north-central parts, however, the soils have developed from the weathered products of the Hawthorn formation.

The surface gradient of the county ranges from level or nearly level to gently sloping, although in places it is more steeply sloping. On the basis of relief and vegetation the county may be divided into (1) high hammock land, (2) low hammock land, (3) undulating pineland, (4) level pineland, (5) scrub ridges, (6) prairies, (7) marshes, and (8) swamps.

The high hammock land occurs as a belt 4 to 5 miles wide between Micanopy and Bland. It is characterized by a gently rolling surface, numerous sinkholes, and by fair to good drainage, which is largely subterranean. In places, especially in the northern part of the area, the surface is dissected by short valleys through which waters flow from the higher lying level pineland to limestone sinks. An example is the valley of Hogtown Creek northwest of Gainesville, which is

about 4 miles long and 60 to 100 feet deep and has a floor 50 to 200 feet wide.

The hammock vegetation consists of a highly variable mixture of hardwoods, pines, and shrubs, with grasses and sedges in the more open areas. Trees include swamp chestnut, laurel, red, water and live oaks, sweetgum, hickory, magnolia, ironwood, basswood, winged elm, prickly-ash, cabbage palmetto, dogwood, holly, hawthorn, and loblolly and longleaf pines. Vines, such as smilax and grape, and shrubs, such as French mulberry and sumac, are common. The more open areas support a ground cover of sedges, smutgrass, wiregrass, carpetgrass, and several species of *Paspalum*. The vegetation in the imperfectly drained areas is thicker and of a wider variety than that in the well-drained ones. In some places where drainage is good, the trees are mainly red oak, hickory, and pine.

The low hammock land differs from the high hammock land in having poorer drainage, a more nearly level surface, and a heavier cover of native vegetation. The larger areas occur at the edges of lakes and prairies in the central and southern parts of the county.

Undulating pineland occurs in disconnected tracts, chiefly on undulating to very gently sloping relief. The largest area lies west of the hammock land. Another belt, 2 to 5 miles wide, extends north and south along the northern two-thirds of the eastern boundary. Smaller areas are scattered throughout the eastern half of the county. Drainage is usually good, but in places, particularly in the eastern part, it is imperfect. Water seeps into the porous underlying strata. Sinkholes are common in the western part of the county and rare in the eastern part. The dominant vegetation cover consists of longleaf pine and wiregrass, but stands of blackjack oak have become established in many places following logging operations. Other vegetation includes hickory, red, live, and turkey oaks, sumac, bracken, chinquapin, fleabane, summer-farewell and partridge-pea. Live oaks are common around sinkholes.

Level pineland prevails in the northeastern half of the county. Natural drainage is poor to imperfect because of the level or depressed surfaces and the presence of layers of impervious sandy clay and clay at varying depths. Small cypress ponds are common and a few small streams have developed. Water is removed mainly by evaporation in many sections that are not reached by streams. The level pineland supports a growth of longleaf, slash, loblolly, and pond pines, wiregrass, gallberry, saw-palmetto, fetterbush, tarflower, runner oak, blueberry, huckleberry, myrtle, pitcherplant, and sedges. In some places the ground cover is mainly wiregrass, and in others it is a mixture of wiregrass and saw-palmetto.

The scrub ridges occur mainly in the southwestern corner of the county. They are characterized by billowy surfaces, excessive drainage, and a native growth of blackjack oak, wiregrass, rosemary, and a few longleaf pines. In places where the relief is smoother, the vegetation consists of scrub live oak and a shrubby undergrowth.

The prairies occur on old lake floors that drain naturally or artificially to cavities in the underlying limestone. Apparently, water conditions in these prairies vary considerably—a prairie may become flooded after being dry for a number of years and remain covered with water for extended periods. Payne Prairie, covering about 12

square miles, drains into Alachua sink, although at the beginning of the twentieth century the sink was clogged for several years so that water accumulated and formed Alachua Lake in the area now covered by the prairie. According to local farmers, the water level on some of the smaller prairies in the south-central part of the county was higher following the heavy rains of October 1941 than at any time during the previous 30 years. The kind of vegetation is determined by the water level. In the deeper parts, water-hyacinth, pickerelweed, lotus, arrowhead, and cattail may be found; in the shallower and the unflooded parts, maidencane, dogfennel, and a wide variety of grasses are present.

The marshes differ from the prairies in that they are naturally very poorly drained at all times. The vegetation consists of water-hyacinth, waterlily, pickerelweed, arrowhead, and similar aquatic plants. The largest areas are found in the vicinity of Orange Lake.

The swamps are confined to the eastern two-thirds of the county and range in size from less than an acre to more than 3 square miles. They include the very poorly drained areas that are forested with such trees as cypress, bay, and gum.

Elevations in the county range from 50 to slightly more than 210 feet above sea level. One ridge, starting 1 mile south of Warren Cave and extending southeast, has a level to undulating crest with an elevation ranging from 180 to more than 210 feet, a width of about ¼ to 1 mile, and a length of about 4 miles.[3] Elevations for various points in the county are as follows (*10*): Paradise, 192; Gainesville, 179; Hague, 174; Hainesworth, 173; Fairbanks and Melrose, 162; Waldo, 150; Hawthorn, 147; Orange Heights, 130; La Crosse, 124; Grove Park and Micanopy, 100; Cadillac and Arredondo, 89; Archer and Alachua, 83; Rochelle, 80; High Springs, 75; Newberry, 72; Island Grove, 69; Evinston, 67; and Half Moon, 54 feet. The water level of Ledwith Lake is 68 feet; Wauburg and Levy Lakes, 62 feet; and Orange Lake, 50 feet.

CLIMATE

Latitude, low elevation, and proximity to the Atlantic Ocean and the Gulf of Mexico give Alachua County a climate characterized by high relative humidity, long warm summers, short mild winters, and abundant rainfall throughout the year. Although the seasonal distribution of rainfall is good, there are some months, usually in spring, in which crops suffer from lack of water. The climate is favorable for corn, bright tobacco, peanuts, tung trees, a large variety of truck crops, and pasture grasses.

The citrus groves are confined to localities protected from cold by lakes, and the groves are fired to prevent or reduce damage when the temperature drops to 28° F. or below. Oats, rye, and such hardy vegetables as cabbage, lettuce, and English peas are grown in winter and are only occasionally damaged. The grazing of wiregrass and of some of the improved pasture grasses continues during the frost season, but the growth and palatability of these grasses are lowered considerably by the low temperature. Outdoor work is performed throughout the winter, and cattle and hogs are not sheltered.

[3] UNITED STATES GEOLOGICAL SURVEY. TOPOGRAPHIC ATLAS OF THE UNITED STATES, FLORIDA, ARREDONDO SHEET. 1890.

Tung trees in basins, on valley floors, and along the bases of slopes have been killed by freezes after emerging from dormancy, whereas adjacent trees at higher levels were unharmed. Areas around lakes are frequented by heavy fogs that modify the low temperatures, so that crops escape some of the later killing frosts of spring and the earlier ones in fall. The average length of the frost-free season is 276 days, from February 26 to November 29, inclusive, but frost has been recorded as late as April 6 and as early as October 24.

The normal monthly, seasonal, and annual temperature and precipitation, as compiled from records of the United States Weather Bureau station at Gainesville, are given in table 1.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Gainesville, Alachua County, Fla.*

[Elevation, 165 feet [1]]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total for the driest year	Total for the wettest year
	° *F.*	° *F.*	° *F.*	*Inches*	*Inches*	*Inches*
December	57. 3	85	18	3. 21	1. 62	6. 24
January	57. 1	89	15	3. 16	. 98	3. 51
February	58. 5	88	.6	2. 92	2. 53	3. 26
Winter	57. 6	89	6	9. 29	5. 13	13. 01
March	64. 4	96	25	3. 35	1. 40	2. 27
April	69. 1	95	32	2. 40	2. 34	3. 71
May	75. 6	99	43	3. 15	. 88	1. 77
Spring	69. 7	99	25	8. 90	4. 62	7. 75
June	79. 8	103	54	6. 84	2. 70	10. 57
July	81. 2	102	60	7. 34	6. 73	5. 76
August	81. 1	100	60	6. 50	5. 74	6. 12
Summer	80. 7	103	54	20. 68	15. 17	22. 45
September	79. 0	99	48	5. 37	6. 60	3. 15
October	72. 0	96	33	2. 84	. 55	15. 78
November	63. 2	90	22	1. 82	. 72	2. 90
Fall	71. 4	99	22	10. 03	7. 87	21. 83
Year	69. 9	103	6	48. 90	[2] 32. 79	[3] 65. 04

[1] Elevation from 1947 U. S. Weather Bureau records. . [2] In 1917. [3] In 1941.

WATER SUPPLY

Good water may be obtained in all parts of the county. Water for home use is obtained from deep wells and to some extent from shallow surface wells in the poorly drained areas. The deep wells are drilled to depths of about 80 feet in the southwestern part of the county and

100 to 120 feet in the northeastern part. The water is pumped mainly by hand, but windmills, gasoline engines, and electric motors are also used. Water for livestock is supplied from wells or is obtained from lakes, ponds, streams, springs, and swamps. Usually surface water cannot be obtained in the western part of the county, but some farmers have claypits or sinks that serve as storage basins for rainwater used by livestock.

Several large lakes are in the eastern half of the county. The most important are Santa Fe in the northeastern corner, Newnan Lake near Gainesville, and Lochloosa, Orange, Levy, and Ledwith Lakes in the southern and southeastern parts.

ORGANIZATION AND POPULATION

Before 1774, the Franciscan missionaries had established at least four missions in the northern part of what is now Alachua County (*6*). In 1820 the first pioneers settled on the Arredondo Grant near the present site of Micanopy. Further efforts by Arredondo, Moses E. Levy, and others, aided by a lull in Indian hostilities, resulted in the influx of many settlers and the organization of Alachua County in 1824. In 1826 the Bellamy Road connecting Tallahassee and St. Augustine was opened, and in 1828 Newnansville, on this road and near the present site of Alachua, was designated as the county seat. In 1855 the railroad from Fernandina to Cedar Keys was extended into the county, and Waldo and Gainesville became stations. Gainesville grew rapidly and in 1856 became the county seat.

According to the census reports, the population of Alachua County was 22,934 in 1890 and 57,026 in 1950. Most of the pioneer settlers of the county came from Georgia, Alabama, and South Carolina, as did many of the later settlers. Gainesville, with a population of 26,861 in 1950, is the largest town in the county and is an important trading center for many of the surrounding counties. Alachua, High Springs, Newberry, Archer, Hawthorn, Micanopy, and Waldo are other important towns.

TRANSPORTATION FACILITIES AND MARKETS

Two railroads, the Atlantic Coast Line and the Seaboard Air Line, serve all parts of the county. Several truck lines operate from Gainesville. United States Highways Nos. 41 and 441 cross the county, and, in addition, about 200 miles of paved State and county roads serve markets and shipping centers. A livestock auction market is at Gainesville, and tobacco warehouses at Lake City (Columbia County) and Live Oak (Suwanee County). Some products are hauled to Jacksonville to be shipped by boat, but most vegetables and fruits are shipped by rail or truck to eastern markets. Fairly well-kept graded roads reach all parts of the county. Most rural homes are easily accessible to mail routes.

COMMUNITY AND FARM IMPROVEMENTS

Educational facilities in the county are good. The University of Florida and its Agricultural Experiment Station are at Gainesville. The laboratory school of the university offers instruction from kindergarten through high school. County high schools are at Gainesville,

Archer, Hawthorn, Alachua, Newberry, and High Springs, and junior high schools are at Waldo, La Crosse, and Micanopy. Courses in vocational agriculture are offered at all the high schools. School children in rural areas are transported by bus to the schools in towns or to small rural schools. The small schools, however, are gradually disappearing and being replaced by larger consolidated schools. Schools for Negroes are scattered throughout the county. Churches of many denominations are at Gainesville, and rural churches are well distributed.

Most farm dwellings and barns are wooden. The dwellings, with the exception of tenant houses, are usually painted, but the barns and other outbuildings are unpainted. Modern plumbing and water systems have been installed on many of the better farms; in 1945, 511 farms reported having running water. Rural electrification lines are being extended rapidly. In 1945, 965 farms reported electric distribution lines within a fourth mile; of these, 600 farms reported having electricity.

INDUSTRIES

Alachua County is primarily agricultural, but a few industries have been established. These include moss-processing factories at Gainesville and Hawthorn, a lumber-treating plant and a destructive distillation plant at Gainesville, machine shops at Gainesville and Archer, a brick kiln at Campville, a sausage and packing plant at Alachua, a peanut-shelling plant at High Springs, a tung-nut crushing plant near La Crosse, crate mills at Gainesville and Micanopy, and 8 turpentine stills and 11 small sawmills throughout the county. The Atlantic Coast Line Railroad has shops at High Springs. Quarrying limerock for road material and chert rocks for gravel and building stones are activities in the western part of the county. The recovery of waste pond phosphate at old mine sites has become important (pl. 1, *A*). The industrial plants and quarries give some employment to farmers and farm labor in slack seasons.

AGRICULTURE

EARLY AGRICULTURE

The Indians of the Alachua tribe of Seminoles had cattle and horses on Payne Prairie and on many of the smaller savannas nearby and were growing crops on the edges of the hammock lands in 1774 (*6*). In 1820 the early white settlers had cattle and hogs on the open range and produced corn, rice, sweetpotatoes, and sugarcane for home use. With the opening of the Bellamy Road, sea-island cotton, indigo, and cattle became important exports. Agricultural development was halted during the Seminole War (1835–42), but after the Indians were driven from Florida, sea-island cotton again became important and remained a leading crop on the hammock lands until 1866, when caterpillars destroyed most of it. Citrus and vegetables replaced cotton in the hammock areas, and cotton and other field crops were grown on the sandier pineland that had not been farmed so extensively.

In 1850 George Payne, a practicing physician of Micanopy, planted selected sweet orange seed and thus began the citrus industry in Alachua County. In 1855 railroads reached the county, and the fol-

lowing year J. J. Barr, using budwood from the Payne grove and wild sour-orange rootstock hauled from the hammocks, developed the first budded grove in the county. Orange growing was subsequently extended until the freeze of 1885, when all the trees were killed. A few of the larger growers again established groves, which were frozen in the winter of 1894–95.

CROPS

In early agriculture, transportation facilities largely controlled the kinds of crops grown. In later years, however, climate, insects, and plant diseases have necessitated many changes in crop production. The infestation of the boll weevil in 1918 caused a rapid decrease in the cotton acreage, and freezing weather along with the development of new citrus areas in central peninsular Florida, where temperatures are more favorable, caused a mild decline in citrus production prior to 1920. Tobacco, peanuts, vegetables, and livestock have replaced to a great extent citrus fruits and cotton as sources of cash income. Recent attempts at reestablishment of sea-island cotton as a major crop have not been successful in the county; for instance, only 35 acres of cotton were planted in 1944, whereas 3,189 acres were planted in 1929. The acreage used for subsistence crops—corn, hay, sweetpotatoes, and sugarcane—has shown considerable variation during the past 60 years, but no definite trend. Oats for grain declined because of the prevalence of rust, but rust-resistant strains are now available and are being used increasingly.

Vegetables grown in 1944 for market included string beans, 1,481 acres; cabbage, 385 acres; tomatoes, 110 acres; celery, 100 acres; English peas, 90 acres; and other vegetables and melons, 4,742 acres. Vegetables grown in home gardens also include watermelons, green field corn, lima beans, cucumbers, peppers, okra, squash, eggplant, carrots, onions, turnips, rutabagas, mustard, collards, lettuce, and cantaloups. The production of celery on peat in the southeastern part of the county was begun on a small scale in 1940 and is being rapidly expanded. Irish potatoes are harvested mainly for sale, whereas most of the sweetpotatoes are kept for home use.

The land used for crops in 1944 included 94,152 acres from which crops were harvested and 617 acres on which crops failed. Most of the velvetbeans, peanuts, soybeans, and cowpeas were planted with other crops, mainly corn. If planted with other crops, these legumes are hogged off or grazed by cattle. Peanuts, if planted alone, are harvested, the nuts sold, and the vines used for hay. Peas and beans grown alone are usually harvested for hay. Oats and rye are used mainly for pasture. Sugarcane is made into sirup for home use. In 1944, 1,495 acres of chufas were hogged off.

Pastures on Alachua County farms in 1944 included 36,044 acres of plowable pasture and 112,101 acres of woodland pasture. Most of the land not in farms is used as range for cattle and hogs. Range grasses consist mainly of wiregrass on the pineland and broadleaf grasses on the hammock land and prairies. Improved pastures are mainly of carpetgrass and Bermuda grass. Many farms have established new permanent pastures in recent years. In 1940, 350 pounds of clover, 3,380 pounds of carpetgrass, 1,000 pounds of Dallisgrass, and 1,500 pounds of common lespedeza seed were sown in Alachua County pastures.

The acreages of the principal crops and the number of fruit and nut trees and grapevines in stated years are given in table 2

TABLE 2.—*Acreage of principal crops and number*[1] *of fruit and nut trees and grapevines in Alachua County, Fla., in stated years*

Crop	1919	1929	1939	1944
	Acres	*Acres*	*Acres*	*Acres*
Corn for grain	56, 333	41, 737	43, 919	30, 522
Corn for silage or fodder, or hogged or grazed	3, 146	2, 772	5, 799	16, 380
Oats threshed	1, 529	83	70	162
Oats unthreshed	(2)	370	565	5, 540
Rye threshed	73	(2)	16	496
Sorghums	[3] 194	71	69	240
Peanuts for all purposes	(2)	3, 102	39, 450	39, 082
Cowpeas [4]	(2)	630	2, 438	2, 742
Soybeans [4]	(2)	13	16	478
All hay	5, 009	3, 306	3, 783	3, 166
Clover or timothy	(2)	4	15	2, 034
Small-grain hay	493	306	96	333
Annual legumes for hay	1, 059	1, 536	3, 134	196
Other tame hay	3, 136	1, 041	286	216
Wild hay	321	419	252	387
Tobacco	6	1, 567	3, 242	2, 458
Irish potatoes	151	1, 278	1, 470	1, 416
Sweetpotatoes and yams	1, 892	717	817	951
Cotton	1, 973	3, 189	78	35
Sugarcane for sirup	1, 323	264	236	327
Chufas for nuts	(2)	80	144	207
	Number	*Number*	*Number*	*Number*
Orange trees	26, 942	27, 000	48, 830	66, 489
Grapefruit do	46	1, 793	1, 689	1, 599
Tung nuts do	(2)	4, 270	197, 606	470, 909
Pecan do	19, 960	45, 822	86, 713	34, 411
Peach do	8, 304	5, 787	8, 951	4, 711
Pear do	5, 707	2, 178	3, 729	3, 142
Plum and prune do	779	2, 144	3, 251	1, 264
Grapevines	1, 037	372	773	397

[1] Number of bearing trees and grapevines given for all years except 1944; the 1944 figures are for trees and vines of all ages.
[2] Not reported.
[3] Includes kafir.
[4] Grown alone and grown with other crops except for green manure.

LIVESTOCK

Most beef cattle are of an inferior type and receive no other feed than that obtained on the range. Some cattlemen are improving the quality of their herds by breeding native cows to Hereford, Aberdeen Angus, or Brahman bulls. A few farmers have excellent herds of purebred Hereford and Aberdeen Angus stock. The range cattle are sold at the local auction market or shipped to other parts of the country to be finished for market. The dairy cattle are mainly grade Jerseys and grade Guernseys. The dairy products are sold locally.

Hogs are common stock or Poland-China and Duroc grades. They are fattened on peanuts or peanuts and corn and butchered for home consumption or sold on foot at the local or nearby auction markets.

Sheep and goats of native breeds are kept by a few farmers. The work stock in the county is small to medium in size and replacements are raised by only a few farmers.

The number of livestock by classes and the production of livestock products are given in table 3.

TABLE 3.—*Livestock and livestock products in Alachua County, Fla., in stated years*

Item	1920	1930	1940	1945
Livestock:				
Horses	3, 153	1, 706	[1] 1, 335	1, 266
Mules	2, 328	1, 822	[1] 1, 910	1, 556
Cattle	34, 515	14, 193	[1] 23, 537	28, 719
Swine	49, 213	24, 436	[2] 26, 694	31, 203
Sheep	615	1, 295	[3] 148	614
Goats	2, 241	1, 195	[2] 1, 627	1, 208
Chickens	87, 136	65, 404	[2] 78, 134	73, 530
Livestock products: [4]				
Milk produced—gallons	298, 014	874, 431	833, 701	1, 039, 570
Butter churned—pounds	59, 131	65, 764	64, 842	([5])
Wool clipped—do	1, 690	2, 740	360	905
Eggs produced—dozens	268, 859	415, 861	450, 041	458, 628
Chickens raised—number	66, 840	98, 366	120, 227	128, 580

[1] Over 3 months old, Apr. 1.
[2] Over 4 months old, Apr. 1.
[3] Over 6 months old, Apr. 1.
[4] Data for years 1919, 1929, 1939, and 1944.
[5] Not reported.

FARM LAND, TENURE, AND EQUIPMENT

The percentage of the total land area in farms increased gradually from 36.9 in 1920 to 60.3 in 1945. The number of farms in the county decreased from 2,684 in 1920 to 1,901 in 1945, whereas the average size of farms increased from 110.7 acres in 1920 to 181.2 in 1945. The average improved acreage per farm increased from 60.3 acres in 1920 to 88.4 in 1945.

According to the 1945 census, 68.4 percent of the 1,901 farms in Alachua County were operated by owners, 11.3 percent by part owners, 0.8 percent by managers, and 19.5 percent by tenants. Most of the tenant farmers were croppers and cash tenants. Croppers furnish all labor, and the landlord furnishes shelter, work stock, implements, and about half the seed and fertilizer. The crops or grazing privileges are usually divided equally between the landlord and the cropper.

Hired labor is used by about 40 percent of the farmers. Most of the hired laborers are employed in harvesting vegetables and fruit and are paid according to the quantity harvested. Day laborers are employed on all types of farms.

The investment in tractors and heavy machinery has been very low, but recently a number of tractors, fully equipped for all tillage operations, have been put into use. In 1945, 389 farms reported having 463 tractors and 597 farms reported 681 motortrucks. Usual farm implements include one-row planters and fertilizer distributors; one- and two-horse moldboard plows; and light plowstocks with a variety of attachments, such as sweeps, scooters, shovels, twisters, and middle-

busters. Implements that are owned or used cooperatively by two or more farmers include small threshers, peanut pickers, mowers, hay rakes, hay balers, and cane mills.

SOIL SURVEY METHODS AND DEFINITIONS

Soil surveying consists of examining, classifying, and mapping of soils in the field. The soil scientist walks over the area at intervals not more than one-quarter mile apart and bores into the soil with an auger or digs holes with a spade. Each boring or hole shows the soil to consist of several distinctly different layers, called horizons, which collectively are known as the soil profile. Each of these layers is studied carefully for the physical and chemical characteristics that affect plant growth.

The color of each layer is noted. There is usually a relationship between the darkness of the upper layer of the soil and its content of organic matter; streaks and spots of gray, yellow, and brown in lower layers generally indicate poor drainage and poor aeration.

Texture, or the content of sand, silt, and clay in each layer, is determined by the feel of the soil when rubbed between the fingers and is checked by mechanical analyses in the laboratory. Texture determines to a considerable extent the quantity of moisture the soil will hold available to plants, whether plant nutrients or fertilizers will be held by the soil in forms available to plants or will be leached out, and the difficulty or ease of cultivating the soil.

Soil structure, or granulation, and the number of pores or open spaces between soil particles determine the permeability or perviousness of the soil, and consequently, the ease with which plant roots penetrate the soil and water enters it.

Consistence, or the tendency of the soil to crumble or to stick together, determines the degree of difficulty that will be encountered in keeping the soil open and porous under cultivation. Consistence covers such soil characteristics as hardness, friability, plasticity, stickiness, compactness, toughness, and cementation.

The kinds of rocks and the parent soil material that develop from these rocks affect the quantity and kind of plant nutrients found in the soil. Simple chemical tests are made to show the degree of acidity of the soil.[4] The depth to bedrock or to compact layers is determined. The quantity of gravel or rocks that may interfere with cultivation, the steepness and kind of slope, the quantity of soil lost by erosion, and other external features are observed.

On the basis of the characteristics here listed, soil areas that are much alike in the kind, thickness, and arrangement of their layers are mapped as one soil type. Some soil types are separated into two or more phases. For example, if a soil type has slopes that range from 2 up to 15 percent, the type may be mapped in two phases, an undulating phase (2- to 7-percent slopes) and a rolling phase (7- to 15-percent slopes). A soil type is broken into phases primarily because of differences in the soil other than those of kind, thickness, and arrangement of layers. The slope of a soil, the frequency of outcropping bedrock, the extent of its erosion, or the artificial drainage

[4] The reaction of the soil is its degree of acidity or alkalinity, expressed mathematically as the pH value. A pH value of 7 indicates precise neutrality; higher values, alkalinity; and lower values, acidity.

used on the soil, for example, are characteristics that might cause a soil type to be divided into phases.

Two or more soil types may have similar profiles, that is, the soil layers may be nearly the same, except that the texture, especially of the surface layer, will differ. As long as the other characteristics of the soil layers are similar, these soils are considered members of the same soil series. A soil series, therefore, consists of all the soil types, whether the number of such soil types be only one or several, that have about the same kind, thickness, and arrangement of layers except for texture, particularly the texture of the surface layer.

The name of a place near where a soil series was first found is chosen as the name of the series: Thus Gainesville is the name of a well-drained slightly to medium acid soil series formed from thin deposits of unconsolidated fine sands and clays over limestone in Alachua County, Fla. One type of the Gainesville series is found—Gainesville loamy fine sand. This type is divided into two phases because some of it is undulating and some is rolling. These two phases are Gainesville loamy fine sand, undulating phase, and Gainesville loamy fine sand, rolling phase.

When very small areas of two or more kinds of soil are so intricately mixed that they cannot be shown separately on a map of the scale used, they are mapped together, and the areas of the mixture are called a soil complex. Gainesville-Arredondo loamy fine sands is a complex of Gainesville loamy fine sand and Arredondo loamy fine sand in Alachua County.

Areas that have little true soil are not designated with series and type names but are given descriptive names, such as Made land; Mines, pits, and dumps; Swamp; and Water and grass.

The soil type, or where the soil type is subdivided, the soil phase, is the mapping unit in soil surveys. It is the unit or the kind of soil that is most nearly uniform and has the narrowest range of characteristics. For this reason land use and soil management practices can be more definitely specified for it than for broader groups of soils that contain more variation.

SOILS OF ALACHUA COUNTY

The soils of the county differ widely in color and somewhat in texture. They also differ in depth to heavy material, character of the underlying material, consistence of lower subsoil, content of organic matter, reaction, relief, drainage, natural fertility, and susceptibility to erosion. In classifying the soils of the county 22 soil series were recognized, in which there are 32 individual mapping units. In addition, areas of Peat and Peaty muck and five miscellaneous land types are mapped.

Many of the soils occur in fairly large areas or broad belts, although in some places there is considerable difference in the occurrence and distribution of the soils and an intricate pattern of well-drained and poorly drained soils is exhibited. In the southwestern and northwestern parts of the county are most of the Archer, Arredondo, Gainesville, Hernando, Fellowship, Jonesville, Fort Meade, and Chiefland soils. Large areas of the Leon soil occur in the eastern, northeastern, and southern parts of the county. Most of the Bladen, Bayboro, and Kanapaha soils are in the southeastern and southern parts and in

Payne Prairie. The Lakeland and Blanton soils are well distributed in the county.

The relief ranges from level, undulating, and gently sloping to rolling. Erosion is negligible except on the more sloping areas of the Gainesville, Fellowship, Archer, and Arredondo soils, which have been under clean cultivation. Little gully erosion is noticeable.

The surface soils are dominantly light colored, ranging from light gray, yellowish gray, and brownish gray to brown in the well-drained soils and from gray to black in the poorly drained soils. The color of the surface soil depends largely on the content of organic matter, whereas that of the subsoil is influenced by the oxidation of the iron compounds or by drainage.

In texture the mineral soils are fine sand or loamy fine sand in the surface soil and fine sand, loamy fine sand, and fine sandy clay in the subsoil. These soils are prevailingly loose and friable, and many of the subsoils are also loose and friable. Much variation is found in the depth of the fine sand over fine sandy clay or the layer of sandy clay over limestone. About 30,000 acres of organic soils, mainly Peat and Peaty muck, are mapped.

The content of organic matter in most of the well-drained soils is prevailingly low, with the exception of the Orlando and Fort Meade soils. Organic matter is high in some of the poorly drained soils, particularly the Rutlege and Bayboro. All of the soils of Alachua County are acid in reaction, ranging from extremely acid to almost neutral. The least acid soils in the county are the Chiefland, Gainesville, and Arredondo. The most acid are the Leon, Rutlege, Plummer, Blanton, Scranton, and Peat.

Most of the fine sands and loamy fine sands occurring on undulating to gently sloping relief and even some areas on level relief are naturally well drained to somewhat excessively drained. The hardpan, which is characteristic of the Leon soil, impedes drainage. Drainage is slow through the heavy subsoils of the Fellowship, Bladen, and Bayboro soils. In the Gainesville, Arredondo, Fellowship, Hernando, Chiefland, Jonesville, and Archer soils the surface drainage is good and the underground drainage is mainly into limestone sinks.

As determined by the parent or underlying material, three main classes of soils are in Alachua County. The Lakeland, Blanton, Kanapaha, Orlando, Rex, Scranton, St. Lucie, Leon, Rutlege, and Plummer series are developed on beds of sands and loamy sand that overlie acid sandy clay. The Bladen and Bayboro soils are formed from heavier material.

Arredondo, Gainesville, Fellowship, and Fort Meade soils are closely associated. They have developed from the Hawthorn geological formation, which consists of beds of fine sand, sandy clay, and phosphatic limestone. These soils contain a higher content of phosphate than the other soils in the county.

The Hernando, Chiefland, Jonesville, and Archer soils are developed from thin to moderately thick unconsolidated beds of fine sand over a layer of sandy clay over Ocala limestone. This limestone is from 1 to 6 feet below the surface. These soils are well drained, and the excess water empties into numerous limestone sinks.

In addition to these three main groups of soils are recent colluvial soils, Peat and Peaty muck, and miscellaneous land types. The colluvial Alachua and Jamison soils have been formed from material

TABLE 4.—*Characteristics of the soil series of Alachua County, Fla.*

Soil series	Parent material	Relief	Drainage	Color			Texture		Subsoil consistence
				Surface soil	Upper subsoil	Lower subsoil	Surface soil	Subsoil	
Alachua	Colluvial material washed from surrounding soils.	Nearly level to gently sloping.	Moderately good	Light brownish gray to dark gray.	Light brownish gray	Yellowish brown	Loamy fine sand	Loamy fine sand	Nearly loose.
Archer	Thin deposits of unconsolidated fine sand and sandy clay over limestone.	Nearly level to gently sloping; limestone sinks.	Good	Light brownish gray	Light yellowish brown	Yellowish brown to reddish brown.	Fine sand	Fine sand to heavy fine sandy clay loam.	Firm.
Arredondo	Hawthorn formation or thin deposits of fine sand and sandy clay over the formation.	Undulating to sloping	do	Light brown or brownish gray.	do	Light yellowish brown.	Loamy fine sand and fine sand.	Loamy fine sand to fine sandy clay loam.	Loose to friable.
Bayboro	Thick deposits of unconsolidated fine sandy loam and clay.	Nearly level	Poor to very poor	Black	Medium gray	Light gray mottled or streaked with yellowish brown.	Loamy fine sand	Plastic clay or heavy fine sandy clay.	Plastic.
Bladen	do	do	Poor	Gray to brownish gray.	Yellowish or light gray.	do	Loamy sand	do	Do.
Blanton	Thick deposits of fine sands	Nearly level to gently sloping.	Moderately good	Light grayish brown to light gray.	Light gray or grayish yellow.	Yellowish gray with white mottles.	Fine sand	Fine sand	Loose.
Chiefland	Thin deposits of unconsolidated fine sand over limestone.	do	Good	Medium gray or brownish gray.	Yellowish gray to pale brown.	Yellowish gray to yellowish brown.	do	do	Do.
Fellowship	Hawthorn formation or thin deposits of fine sand over the formation.	Undulating to rolling	Imperfect	Medium gray	Light gray	Mottled light gray and brown.	Loamy fine sand	Heavy fine sandy clay	Plastic.
Fort Meade	do	Nearly level to undulating.	Good	Dark gray or grayish brown.	Brownish gray	Brownish gray or yellowish brown.	do	Loamy fine sand	Nearly loose.
Gainesville	Thin deposits of unconsolidated fine sand and fine sandy loam over the Hawthorn formation.	Undulating to gently rolling.	do	Brown to brownish gray.	Moderate brown	Yellowish brown or weak reddish brown.	do	Loamy fine sand to fine sandy loam.	Loose to friable.
Hernando	Thin deposits of unconsolidated fine sand and sandy clay over Ocala limestone.	Nearly level to gently sloping; limestone sinks.	do	Light brownish gray	Yellow or light yellowish brown.	Light yellowish brown.	Fine sand	Loamy fine sand to clay.	Friable to plastic.
Jamison	Colluvial material washed from surrounding soils.	Nearly level	Moderately good	Yellowish gray	Yellow to yellowish gray.	do	Loamy fine sand and fine sand.	Loamy fine sand	Nearly loose.
Jonesville	Moderately thick deposits of unconsolidated fine sand and clay over limestone.	do	Good	do	Pale yellow to light yellowish brown.	Yellowish brown or mottled reddish brown and yellow.	Fine sand	Fine sand	Loose.
Kanapaha	Thin deposits of unconsolidated fine sand and sandy clay over limestone.	do	Moderately good	Gray	Light gray to almost white.	Yellowish white	do	do	Do.
Lakeland	Thick deposits of unconsolidated fine sand over sandy clay.	Nearly level to hilly	Good to excessive	Pale brown	Yellow to light yellowish brown.	Yellow or yellowish gray.	do	do	Do.
Leon	Thick deposits of unconsolidated sand over sandy clay.	Level to nearly level	Imperfect to poor	Medium gray	White or yellowish white.	Black to dark brown	do	Organic hardpan	Loosely to firmly cemented.
Orlando	Thick deposits of unconsolidated fine sand and sandy clay.	Nearly level to gently sloping.	Moderately good	Dark gray to dark grayish brown.	Medium gray	Light gray or yellowish gray.	do	Fine sand	Loose.
Peat [1]	Organic deposits	Level	Very poor	Dark brown	Brown or dark brown	Brownish gray or gray			Fibrous
Plummer	Thick deposits of loamy sand over sandy clay.	Nearly level	Poor	Gray	Light gray	Light gray	Fine sand	Fine sand	Loose.
Rex	do	Nearly level to undulating.	Imperfect	Gray or dark gray	Yellowish gray	Mottled light gray, yellow, and brown.	Loamy fine sand	Loamy fine sand to fine sandy loam.	Nearly loose to friable.
Rutlege	Thick beds of acid sand and loamy sand.	Nearly level	Very poor	Black or dark gray	Yellowish gray or light gray.	Light gray mottled with yellow or brown.	Fine sand	Fine sand to fine sandy loam.	Do.
St. Lucie	Thick deposits of white sand	Undulating	Excessive	Light gray	White	White to grayish yellow.	do	Fine sand	Very loose.
Scranton	Thick deposits of sand over sandy clay.	Level to nearly level	Imperfect to poor	Black or dark gray	Brownish gray or dark gray.	Mottled gray, yellow, and brown.	Fine sand and loamy fine sand.	Loamy fine sand	Nearly loose.

[1] Undifferentiated as to series.

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washed or sloughed down from the adjacent sloping uplands. The miscellaneous land types include Alluvial soils, undifferentiated; Water and grass; Swamp; Mines, pits, and dumps; and Made land.

The important characteristics of the soil series of Alachua County are given in table 4.

SOIL SERIES, TYPES, AND PHASES

In the following pages the soils, identified by the same symbols as those on the soil map, are described in detail and their agricultural relationships are discussed. Their location and distribution are shown on the map in the envelope on page 3 of the cover, and their acreage and proportionate extent are given in table 5.

TABLE 5.—*Acreage and proportionate extent of the soils mapped in Alachua County, Fla.*

Soil	Acres	Percent
Alachua loamy fine sand	4,036	0.7
Alluvial soils, undifferentiated	7,200	1.2
Archer-Jonesville fine sands	4,271	.7
Arredondo-Fellowship loamy fine sands	2,567	.4
Arredondo loamy fine sand-fine sand	27,430	4.8
Bayboro loamy fine sand	15,544	2.7
Bladen loamy sand	3,929	.7
Blanton fine sand	20,649	3.6
Shallow phase	2,571	.4
Chiefland fine sand	14,684	2.5
Fellowship gravelly loamy fine sand, undulating phase	498	.1
Fellowship loamy fine sand:		
Rolling phase	6,036	1.0
Undulating phase	8,969	1.6
Fort Meade loamy fine sand	7,582	1.3
Gainesville-Arredondo loamy fine sands	13,910	2.4
Gainesville loamy fine sand:		
Rolling phase	2,572	.4
Undulating phase	4,981	.9
Hernando-Jonesville fine sands	41,989	7.3
Jamison loamy fine sand	3,553	.6
Jonesville-Hernando fine sands	47,451	8.2
Kanapaha-Bladen complex	4,862	.8
Kanapaha fine sand	20,818	3.6
Lakeland fine sand:		
Deep phase	9,360	1.6
Undulating phase	60,240	10.4
Leon fine sand	93,193	16.3
Made land	1,290	.2
Mines, pits, and dumps	903	.2
Orlando fine sand	23,807	4.1
Peat	9,751	1.7
Peaty muck	19,953	3.5
Plummer fine sand	6,608	1.1
Rex loamy fine sand	21,789	3.8
Shallow phase	4,370	.8
Rutlege fine sand	25,404	4.4
Rutlege loamy fine sand, shallow phase	2,954	.5
St. Lucie fine sand	1,298	.2
Scranton loamy fine sand-fine sand	12,433	2.2
Swamp	655	.1
Water and grass	17,170	3.0
Total	577,280	100.0

ALACHUA SERIES

The Alachua soil is composed of mixed colluvial and alluvial materials washed or sloughed from Gainesville, Arredondo, and Fort Meade soils. Areas occur in depressions and at the bases of slopes. Drainage is moderately good. The reaction is slightly to medium acid. Only one type—Alachua loamy fine sand—is mapped in the county.

Alachua loamy fine sand (Aa).—This moderately well drained recent soil has formed mainly since the cultivation of the soils on the sloping uplands began. It occurs in close association with the Gainesville, Arredondo, and Fort Meade soils and consists of materials washed or sloughed from them. Areas are at the base of slopes and are spread out over level areas and in some places in slight depressions. The soil is mainly near Alachua, Santa Fe, and Bland.

To depths of 8 to 18 inches is light brownish-gray to dark-gray nearly loose loamy fine sand containing a considerable quantity of organic matter. This is underlain by yellowish-brown or pale-brown nearly loose loamy fine sand, which extends to a depth of 30 to 40 inches. The depth of the recently accumulated material is variable. It thins out and grades into the uplands as it extends up the slopes, and the subsoil is like the original surface soil of the uplands. In some places it is somewhat difficult to determine definitely the boundary between this soil and the associated upland soils.

Use and management.—About 90 percent of Alachua loamy fine sand is cultivated and the rest is forested with live, red, and laurel oaks, magnolia, and loblolly and longleaf pines. Because of good moisture conditions this soil is especially suited to corn, sugarcane, oats, and pasture grasses. Most of it is farmed in connection with the Gainesville, Arredondo, and Fort Meade soils, but usually the yields of corn and sugarcane are a little higher on this soil, even though fertilization and management practices are the same as on the associated soils.

ALLUVIAL SOILS, UNDIFFERENTIATED

Alluvial soils, undifferentiated (Ab) are on the flood plains or first bottoms and occur as narrow strips along the Santa Fe River and some of the creeks and branches. These soils are composed of material washed from uplands and deposited by the streams. Because of the wide variation in texture, color, and consistence, it is impractical to make type separations of these materials.

Along the Sante Fe River and other streams some of the soil material resembles Bibb fine sand (not mapped in this county), which is a poorly drained light-gray fine sand extending to a depth of 3 feet or more. In other places a well-drained light yellowish-brown fine sand or a poorly drained black or dark brownish-gray fine sand is found. Included is a small area where the surface soil to a depth of 12 inches is a brownish-gray fine sandy loam containing a large quantity of organic matter. It has a pH value of 6 or more. It is underlain by a medium-gray calcareous silt loam, which at 16 to 30 inches grades into marly clay.

Use and management.—Alluvial soils, undifferentiated, are not cultivated. They are covered with a growth of slash and loblolly pines, sweetgum, blackgum, red maple, laurel and water oaks, mag-

A, Abandoned phosphate quarry; protruding rocks are Ocala limestone.
B, Profile of Archer fine sand, showing depth to fine sandy clay. Pine vegetation in background.

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Prairie areas of Bladen loamy sand on Payne Prairie; soil on left is prairie inclusion of Bayboro loamy fine sand.

nolia, willow, and hickory. In wetter areas, cypress, gum, and bay are dominant. These soils afford some pasture for cattle in dry seasons. If they were drained or partly drained, cleared of most of the trees, limed, seeded, and fertilized, good pastures could be obtained.

ARCHER SERIES

The Archer series has developed from thin beds of unconsolidated sand and sandy clay that have been deposited over limestone. Some of the weathered material from limestone may be mixed with the overlying sandy clay and sand. This series is associated with and closely related to the Hernando, Jonesville, and Chiefland series. It differs essentially from the Hernando in having reddish-brown or yellowish-red moderately heavy fine sandy clay loam or fine sandy clay over limestone. In the Archer series the fine sandy clay is 8 to 30 inches below the surface (pl. 1, *B*). The Chiefland series lacks the sandy clay layer over limestone.

Relief is favorable and drainage is naturally good. Most areas of Archer fine sand contain small areas of Jonesville fine sand, and therefore a complex of Archer-Jonesville fine sands is mapped.

Archer-Jonesville fine sands (Ac).—This soil complex has developed on low-lying ridges or slight knolls in the southwestern part of the county, particularly south and east of Archer. Archer fine sand constitutes 60 to 65 percent of it. This complex occurs in close association with Hernando-Jonesville fine sands. All areas have good surface and internal drainage. The drainage waters find their way to the sinks in the limestone and there are no perennial streams. The surface relief ranges from undulating to gently sloping and is pitted with numerous small limestone sinks. The moisture-holding capacity of Archer fine sand is good.

Representative profile of Archer fine sand in a wooded area about 1 mile east of Archer:

0 to 4 inches, light brownish-gray loose fine sand containing a small quantity of organic matter.
4 to 16 inches, light yellowish-brown or pale-brown loose fine sand.
16 to 24 inches, light yellowish-brown nearly loose loamy fine sand or friable light fine sandy loam.
24 to 28 inches, reddish-brown slightly compact heavy fine sandy clay loam that readily breaks into irregular-shaped fragments ¼ to ¾ inch in diameter.
28 to 40 inches, light-brown or yellowish-red fine sandy clay mottled with light gray and streaks of yellow.
40 inches +, Ocala limestone.

In cultivated fields the surface soil to plow depth ranges from yellowish gray to brownish gray to pale brown. In all areas of Archer fine sand there is much difference in the depth of the fine sand layer over the sandy clay. In some places the sandy clay is near the surface, whereas in others it may be anywhere from 24 to 30 inches below it. Locally small areas of light yellowish-brown light-textured fine sandy loam that have fine sandy clay at 4 to 10 inches below the surface are included. In the immediate vicinity of Archer the surface soil in some places contains 50 percent or more very fine sand. On the edge of some of the sinks, limestone rock is exposed.

The Jonesville fine sand part of this complex consists of a yellowish-gray fine sand underlain by yellow or pale-brown fine sand extending

to depths of 30 to 60 inches or more. This overlies a layer of sandy clay over limestone. These small areas are scattered throughout the Archer-Jonesville fine sands complex.

Use and management.—About 70 percent of Archer-Jonesville fine sands is cultivated. The rest is forested with longleaf pine and a few oaks and hickory. The wiregrass growth, together with some other natural grasses, affords range pasture for cattle and hogs. Archer fine sand is considered a good agricultural soil for peanuts, bright tobacco, and watermelons, all of which are cash crops. Corn, velvetbeans, sugarcane, and some truck crops are also grown. The yields and the fertilization are about the same as those on Hernando fine sand. On the deeper fine sands—Jonesville fine sand—peanuts, velvetbeans, and corn are the main crops. The yields under similar management practices are slightly lower than those obtained on the representative areas of Archer fine sand and are comparable with the yields on the Jonesville-Hernando fine sands.

This complex is easily tilled and responds readily to fertilization and to the turning under of green-manure crops. Like most of the well-drained soils of the county, these soils are deficient in humus, which can best be supplied by growing and turning under leguminous crops, such as velvetbeans, cowpeas, lupine, and crotalaria.

ARREDONDO SERIES

The soils of the Arredondo series have been derived from beds of fine sand and fine sandy clay, in places mixed with material from phosphatic Hawthorn limestone. Relief is undulating to gently rolling, and both surface and internal drainage are good. These soils are associated with Gainesville, Fellowship, and Fort Meade soils and locally adjoin areas of Lakeland soils. They are intermediate in color between the Lakeland and Gainesville. They are more brown than the Lakeland, less brown than the Gainesville, and much less gray than the Fellowship and Fort Meade. Arredondo-Fellowship loamy fine sands and Arredondo loamy fine sand-fine sand are mapped.

Arredondo-Fellowship loamy fine sands (Ad).—This complex consists mainly of Arredondo loamy fine sand, with small areas of Fellowship loamy fine sand and soils intermediate in characteristics between the two soils. Fairly large areas are in the western part of the county in association with Gainesville, Fellowship, and Fort Meade soils. The largest area begins near Levy Lake and extends in a northwestern direction across the county. Relief is undulating to gently rolling. Most areas have a relief of 2 to 7 percent, but some small areas have 7- to 15-percent slopes. Both surface and internal drainage are good because of favorable surface relief and the nearly loose character of the soil. The reaction is medium to strongly acid.

Representative profile of Arredondo loamy fine sand taken from a field:

0 to 8 inches, light-brown or brownish-gray nearly loose loamy fine sand containing a small quantity of organic matter.
8 to 16 inches, light-brown or light yellowish-brown nearly loose loamy fine sand.
16 to 20 inches, light yellowish-brown or brownish-yellow friable fine sandy loam or fine sandy clay loam.
20 to 40 inches, light yellowish-brown or grayish-yellow moderately friable fine sandy clay.

In wooded areas the first 3 or 4 inches of the surface soil are usually grayish brown or dark gray and contain considerable organic matter. Where areas border Gainesville soils, Arredondo soils are browner in both surface soil and subsoil; areas adjoining the Lakeland soil are lighter in color. Arredondo loamy fine sand is intermediate in characteristics between Gainesville and Lakeland soils. In some places a noticeable quantity of chert gravel is scattered over the surface and mixed with the soil. Fine sandy loam or fine sandy clay is at depths of 10 to 30 inches or more below the surface. Where the finer sediments lie within 8 to 12 inches of the surface, the soil is really fine sandy loam.

The areas of Fellowship loamy fine sand of this complex consist of a gray or dark brownish-gray nearly loose loamy fine sand to depths of 8 to 12 inches. This material is underlain by yellowish-gray, mottled with brown, loamy fine sand to depths of 20 to 30 inches or more. Below this range is light-gray, mottled with brown, sticky fine sandy loam or fine sandy clay.

Use and management.—About 70 percent of Arredondo-Fellowship loamy fine sands is cultivated, a small percentage is in pasture, and the rest is forested with hardwoods and loblolly pine. This complex is good agriculturally and is used mainly for peanuts, corn, and velvetbeans, and to a less extent for sugarcane and vegetables.

Corn yields 18 to 30 bushels an acre, depending on the fertilizer practices. Some farmers apply 200 to 400 pounds an acre of 3–8–5 [5] at planting time and side dress with nitrate of soda at the rate of 100 to 150 pounds 5 to 6 weeks later. Peanuts yield 600 to 700 pounds an acre. Where interplanted, corn and peanuts give fair yields. Cotton produces about 250 pounds an acre. Sugarcane yields 225 to 250 gallons of sirup an acre. Okra, sweetpotatoes, squash, and other vegetables do well. All are heavily fertilized. Some tung trees and pecans are grown.

Arredondo loamy fine sand-fine sand (Ae).—This soil complex occurs in the western part of the county in close association with Arredondo and Gainesville soils and adjoins Lakeland areas. It is intermediate in color between the Lakeland fine sand phases and Gainesville loamy fine sand. It is browner in both surface soil and subsoil than the Lakeland soils but not so brown as the Gainesville. Most areas have developed in broad belts on low ridges and long gentle slopes mainly between Micanopy and Bland. Relief is undulating to gently sloping.

Arredondo loamy fine sand comprises by far the greater part of this complex. The surface soil to depths of 6 to 8 inches in a cultivated field is light-brown or brownish-gray nearly loose loamy fine sand. This is underlain by light yellowish-brown or pale-brown nearly loose loamy fine sand that continues to depths of 40 or 50 inches or more below the surface. Below this loamy fine sand is a friable fine sandy loam or fine sandy clay mottled with pale brown, yellowish brown, and gray. Where this soil grades toward Lakeland soils it is less loamy and lighter in color than where it grades toward the Gainesville. There is considerable variation in the depth to fine sandy loam or fine sandy clay.

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

In some areas of Arredondo loamy fine sand are small areas of Arredondo fine sand that could not be readily separated on the soil map. In these areas the texture is lighter and the sandy material usually extends to slightly greater depths than in the loamy fine sand. The fine sand areas are slightly more droughty and slightly less productive.

Included with this complex are small areas that occur on the short breaks along the streams or on slopes of 7 to 15 percent. On these slopes the surface soil has a slightly lower organic-matter content and is more subject to erosion.

Use and management.—Much of Arredondo loamy fine sand-fine sand is under cultivation, a small percentage is idle, and the rest is forested with longleaf and loblolly pines and some hardwoods. The crops and management practices are about the same on this soil as for Arredondo-Fellowship loamy fine sands, but the yields are slightly lower.

Only a small percentage of the sloping inclusion is cultivated. Most of it is forested with loblolly and longleaf pines and some hardwood, and some of it is in permanent pasture. It is farmed in connection with Arredondo loamy fine sand-fine sand, but the yields, under similar practices, are about 20 percent lower and the cultivation is more difficult. The best use for the more sloping areas is probably permanent pasture. Some of the steeper slopes should remain in forest.

BAYBORO SERIES

The soil of the Bayboro series occurs in low poorly to very poorly drained areas. It is strongly to very strongly acid and is associated with Bladen and other poorly drained soils. It differs from the Bladen soil in having a black surface soil to depths of 10 to 18 inches and from the other associated soils in having heavy-textured material usually within 20 to 30 inches of the surface. Only one unit, Bayboro loamy fine sand, is mapped.

Bayboro loamy fine sand (Ba).—The small areas of this soil are between Newnan and Orange Lakes in the southeastern part of the county and are closely associated with the Bladen soil. Drainage is naturally poor to very poor, and some areas are swampy or semiswampy.

The surface soil to depths of 8 to 14 inches is black or very dark-gray loamy fine sand or light-textured fine sandy loam. This is underlain by medium-gray loamy fine sand 2 to 6 inches thick. Beneath this layer light-gray or medium-gray plastic clay or heavy fine sandy clay mottled or streaked with yellowish brown extends to a depth of 50 inches or more. In a few places there is a shallow covering of dark-brown peaty muck on the surface.

Included with this soil are prairie areas on Payne Prairie, shown by map symbol. These areas differ from the rest of Bayboro loamy fine sand in having a somewhat thicker organic layer and in being covered with maidencane, giant carpetgrass, pickerelweed, water-hyacinth, sawgrass, and other aquatic plants. In the virgin state this land is covered with water for long periods.

Use and management.—Bayboro loamy fine sand is inherently a good soil, but practically none of it is cultivated. It supports a growth

of magnolia, cabbage palmetto, cypress, and live and water oaks. It provides range pasture for cattle and hogs. Artificial drainage is necessary for its reclamation for agricultural purposes. Corn, truck crops, and pasture grasses would do well.

Practically none of the included prairie areas are cultivated. If the surface water were removed, grazing would be very good; if the soil were adequately drained, a wide variety of crops could be produced.

BLADEN SERIES

The Bladen soil occupies low-lying level areas and is poorly drained. It has formed from thick beds of fine sandy loam and clay and is strongly to very strongly acid throughout. It is associated with Bayboro and Leon soils, but differs from the Bayboro in having a lighter colored surface layer, and from the other associated soils in having a heavier subsoil. Bladen loamy sand is the only unit mapped.

Bladen loamy sand (Bb).—Large areas of this soil are in the southeastern part of the county near Island Grove and in the vicinity of Lake Levy and Orange Lake. Smaller areas occur throughout the eastern part of the county. The relief is almost level, and near the lakes are slight depressions in which water stands part of the time. Both surface and internal drainage are poor.

Profile description:

0 to 7 inches, gray to brownish-gray nearly loose loamy sand containing a noticeable quantity of organic matter.
7 to 12 inches, yellowish-gray or light-gray nearly loose loamy sand.
12 to 52 inches, gray or light-gray plastic clay or plastic heavy fine sandy clay mottled or streaked with yellowish brown.
52 inches +, medium-gray plastic heavy clay with slight mottlings of yellowish brown.

In a few places, particularly near Orange Lake, alkaline marly material is 30 or 40 inches below the surface. The depth at which the fine sandy clay or clay occurs is variable; it may be found at any depth between 10 and 30 inches below the surface. Areas of Bladen loamy fine sand, occurring in the southeastern part of the county, are included. Very small areas of Leon fine sand, too small to be shown on the map, are also included in many areas.

Also included are prairie areas, which are shown on the map by symbol. These areas occur mainly on Payne Prairie in close association with Bayboro soil (pl. 2). They are distinguished from the rest of Bladen loamy sand in that they have a prairie vegetation, such as maidencane, giant carpetgrass, hyacinth, and sedges. Payne Prairie was formerly covered with water several feet deep, but now a part of it is dry most of the year.

The surface soil of these included prairie areas is brownish-gray loamy fine sand or loamy sand to depths of 6 to 9 inches. This is underlain by light-gray or yellowish-gray loamy fine sand, which extends to depths of 24 to 30 inches. Beneath this is pale-brown or light-gray heavy sticky fine sandy clay or plastic clay with yellow or yellowish-brown mottlings.

Use and management.—About 40 or 50 percent of Bladen loamy sand has been drained and is cultivated. The rest supports a growth of loblolly and slash pines, live oak, magnolia, sweetgum, myrtle, and cabbage palmetto on the better drained areas. The more poorly drained

areas, particularly south of Gainesville, have a swamp growth of cypress, gum, bay, and some cabbage palmetto. Artificial drainage is necessary to reclaim this soil for farm crops. Drainage can be established by open ditches because the heavy subsoil permits the walls or banks of the ditches to stand up well.

This is a good agricultural soil. Corn, truck crops, and citrus are the important crops grown. The citrus is confined to the protected areas, mainly near Island Grove, where winter temperatures are moderated by the lake. A good quality of citrus is produced. Other areas of this soil, if properly drained, could be cultivated and could produce good pasture. Corn yields 20 to 30 bushels an acre, and if given heavy applications of fertilizer, truck crops yield well.

Only a small percentage of the included prairie area is cultivated. It is used for truck crops and yields are about the same as on Bladen loamy sand. Most of it is used as a natural pasture for cattle, its best use under present conditions. It would be difficult to establish sufficient drainage for ordinary crops. The pastures could be considerably improved by seeding legumes and improved grasses and by applying lime and fertilizer.

BLANTON SERIES

The Blanton series includes the moderately well drained soils that have developed from thick deposits of unconsolidated fine sands. These strongly to very strongly acid soils occur in close association with Lakeland and Leon soils. They differ from the Lakeland in having more gray and less yellow or brown in the subsoil and a weaker surface relief, and, in places, in being less well drained. They were originally covered with longleaf pine and an undergrowth of wiregrass. Blanton fine sand and its shallow phase are mapped.

Blanton fine sand (Bc).—Occurring in small to large areas distributed over the eastern half of the county, this soil is closely associated with Lakeland fine sand and Rex loamy fine sand. It is not so excessively drained as the Lakeland soils, but it is better drained and generally more undulating than Rex loamy fine sand. Both surface and internal drainage are good. The splotched coloration in the subsoil indicates that the internal drainage is not so good as in the Lakeland soils, but the moisture-holding capacity is better. The relief is almost level, undulating, or gently sloping.

Profile (pl. 3, *A*) description in a forested area:

0 to 3 inches, light grayish-brown loose fine sand containing a small quantity of organic matter.
3 to 20 inches, grayish-yellow or light-gray loose fine sand.
20 to 50 inches, light-gray or grayish-yellow loose fine sand with splotches of white fine sand.
50 inches +, mottled light-gray and yellow friable fine sandy loam or fine sandy clay loam.

Locally, fine sandy loam, loam, or fine sandy clay may be reached at 40 inches below the surface, or it may be 60 inches or more deep. Near Lochloosa the texture is a coarser sand. Small areas of the Lakeland fine sand phases and Rex loamy fine sand are mapped with this soil. In some places it is somewhat difficult to draw a boundary between the Lakeland and Blanton soils.

Use and management.—About 15 to 20 percent of Blanton fine sand is cultivated, about 5 to 10 percent is abandoned or idle land, and the

rest supports a growth of longleaf pine and wiregrass with a scattering of live and turkey oaks. Of the cultivated soil, about 40 percent is used for intertilled crops of corn, peanuts, and velvetbeans. A small percentage is used for tobacco, watermelons, and other crops. Some pecan and tung trees are grown (pl. 4, *A*).

Corn yields 9 to 18 bushels an acre; peanuts, 400 to 550 pounds; cotton, 150 pounds; and tobacco, 700 to 900 pounds. The yields of sugarcane, cucumbers, sweetpotatoes, and okra are comparatively low. The quantity of fertilizer applied and the general farm practices are similar to those for the Lakeland fine sand.

The content of mineral plant ingredients is low, and the supply of humus very low. This soil would be greatly improved by the incorporation of green-manure crops. Crotalaria grows well and when turned under improves the soil and increases yields. Since this soil is very strongly acid, lime applications may prove beneficial.

Blanton fine sand, shallow phase (Bd).—This phase differs essentially from Blanton fine sand in that at depths of 30 to 40 inches a fine sandy loam or fine sandy clay is reached. Areas are in the eastern part of the county in association with Blanton and Leon fine sands and Rex loamy fine sand. The relief is undulating to gently sloping. All areas are well or moderately well drained in the surface, but internal drainage is imperfect in some places because of the height of the ground-water level for long periods.

Use and management.—Probably 40 or 50 percent of Blanton fine sand, shallow phase, is cultivated, and the rest supports a growth of longleaf pine and a few live and turkey oaks. The yields are about 10 percent higher than for crops on Blanton fine sand under similar management practices and similar fertilizer applications.

CHIEFLAND SERIES

The soil of the Chiefland series has formed from thin beds of fine sand over limestone. Immediately over the limestone there is a thin layer of fine sandy loam in places, and this layer and perhaps the lower part of the fine sand may be influenced by material developed from the limestone. This soil is associated with Hernando, Archer, Jonesville, and Lakeland soils. It differs from Lakeland soils in being underlain by limestone and in being less acid, and from the other associated soils in lacking an appreciable layer of sandy clay over the limestone. Drainage is good, and relief is level to slightly undulating. Chiefland fine sand is the only unit mapped.

Chiefland fine sand (Ca).—Large continuous areas of this soil occur in the western part of the county in close association with Lakeland fine sand soils and Jonesville fine sand. The soil differs from Blanton and Lakeland fine sands chiefly in being only slightly acid or almost neutral in reaction and in being underlain at comparatively shallow depths by limestone. Drainage is good to excessive because of the open and porous surface soil, subsoil, and underlying limestone. The moisture-holding capacity is low. All drainage is internal and subterranean, as there are no streams in any areas of this soil. Relief is favorable, ranging from almost level to slightly undulating.

Representative virgin profile:

0 to 2 inches, brownish-gray loose fine sand with a small quantity of organic matter.

2 to 15 inches, medium gray or brownish-gray loose fine sand.
15 to 50 inches, yellowish-gray to pale-brown loose fine sand with brownish-gray splotches.
50 to 53 inches, yellowish-brown friable but slightly sticky fine sandy clay.
53 inches +, limestone.

Variations occur in the depth of the limestone below the surface and the thickness of the sandy clay subsoil. In many places this sandy clay layer is absent and the fine sand rests directly on the limestone. Some of the limestone is phosphatic.

Use and management.—About 30 percent of Chiefland fine sand is cultivated, a small acreage is idle, and the rest is covered with longleaf pine, live and scrub oaks, hickory, and an undergrowth of wiregrass. It is well suited to bright tobacco and peanuts. Some corn and truck crops are also grown. The soil responds readily to fertilization and the addition of organic matter.

FELLOWSHIP SERIES

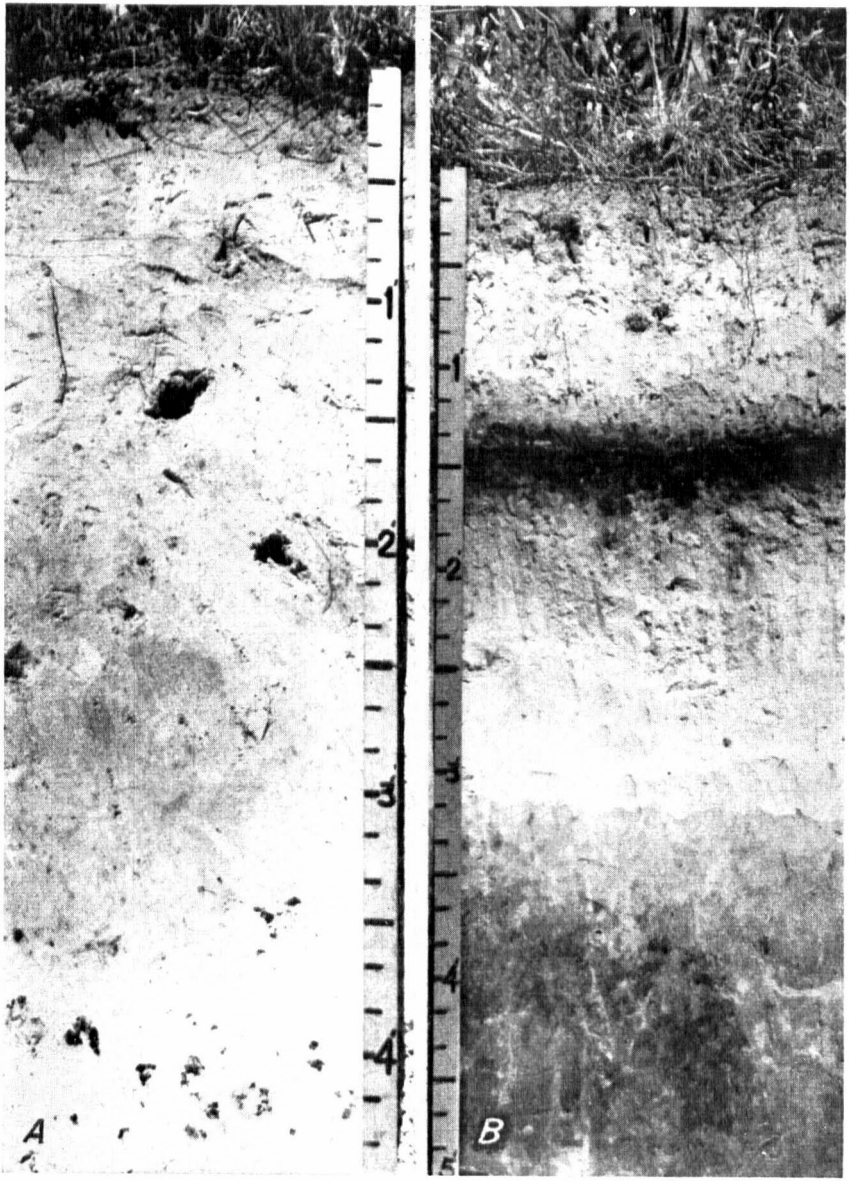
The soils of the Fellowship series have formed largely from the Hawthorn formation. In places, thin deposits of unconsolidated sand and clay overlie this formation. These soils are associated with Gainesville, Hernando, Arredondo, Fort Meade, and Kanapaha soils. Fellowship soils are less well drained, grayer, more mottled, finer textured, and more plastic in the deeper layers than any of the associated soils. They occupy undulating to rolling relief and have imperfect internal drainage. The undulating and rolling phases of Fellowship loamy fine sand and the undulating phase of Fellowship gravelly loamy fine sand are mapped.

Fellowship loamy fine sand, undulating phase (Fc).—This soil has developed in the southwestern, west-central, and northwestern parts of the county in close association with Arredondo, Gainesville, and Hernando soils. It is easily distinguished from those soils by its darker surface soil and mottled subsoil. Relief is mostly undulating to slightly rolling (2- to 7-percent gradient). Areas having a steeper slope than 7 percent have been included in the rolling phase. The slopes are usually long and smooth, and considerable sheet erosion has taken place on some of the steeper ones. Surface drainage is fair to good, but internal drainage is imperfect to poor because of the heavy clay subsoil and the heavy material underlying the subsoil. On some of the slopes are seepage spots where the lateral-percolating waters find their way to the surface. Most of the drainage waters enter through short intermittent branches or ravines to the lime sinks or depressions at the base of the slopes. There are practically no perennial streams.

Profile description in a cultivated field:

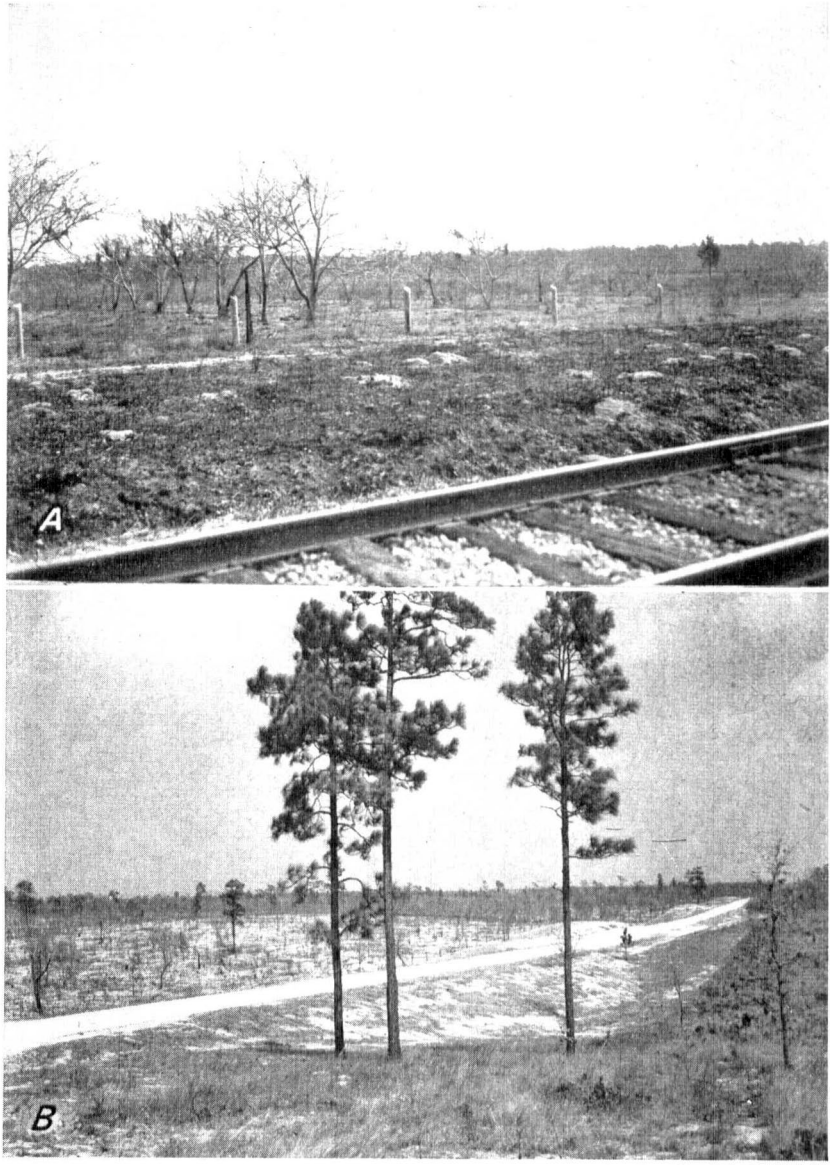
0 to 6 inches, gray or dark-gray friable loamy fine sand containing a small quantity of organic matter.
6 to 18 inches, yellowish-gray or light-gray friable loamy fine sand.
18 to 42 inches, gray or light-gray, mottled with brown, heavy fine sandy clay or clay; very plastic when wet, firm when moist, very hard when dry; shrinks, cracks, and breaks into large angular blocks when drying.
42 inches +, mottled light-gray and brown heavy clay with some chert gravel, cobbles, and limestone fragments.

Included in mapping are small areas of Arredondo, Gainesville, and Fort Meade soils. On the more sloping areas sheet erosion has removed part of the original surface soil and the mottled clay is within



A, Profile of Blanton fine sand, an example of the soils in the uplands. This soil is closely related to the Lakeland series. The slightly darkened surface layer 2 to 3 inches thick and the uniformity of the rest of the profile are shown. Two rodent holes occur near a depth of 2 feet, and a few dark concretions are present at 4 feet. (Photo by Roy W. Simonson.)

B, Profile of Leon fine sand, one of the extensive soil types in the county. The organic hardpan is prominent in this profile, which happens to have a second dark layer at the bottom of the exposure. (Photo by Roy W. Simonson.)



A, Effect of soil on growth of tung trees: Poor trees on right are on Leon fine sand, and better trees on left are on Blanton fine sand.
B, Lakeland fine sand, deep phase, showing rolling relief and vegetation of scattered longleaf pine, scrub oak, and wiregrass.

a few inches of the surface. Such areas are really a fine sandy loam or fine sandy clay loam. Locally the loamy fine sand extends to a depth of 30 inches. In a few places small chert gravel and cobbles are scattered on the surface and mixed with the soil. Areas where these are abundant and mixed with larger fragments of chert have been mapped as Fellowship gravelly loamy fine sand, undulating phase.

Use and management.—About 40 percent of Fellowship loamy fine sand, undulating phase, is cultivated, and a small percentage is in permanent pasture. The forested areas support a hardwood growth of live and water oaks, sweetgum, hickory, magnolia, and loblolly pine. The woodland affords range pasture for cattle and hogs. The important crops grown are corn, velvetbeans, peanuts, and vegetables. This is one of the best soils in the county for sugarcane, cabbage, green corn, cucumbers, eggplant, and squash. Near Micanopy, where it occurs in fairly large tracts, it is used for vegetables. Because of the fairly high content of organic matter in the surface soil and favorable moisture conditions, this is a good pasture soil. Tung trees are also grown.

Corn planted alone yields 18 to 30 bushels an acre, depending upon the quantity and kind of fertilizer used. Corn planted with peanuts produces about 15 bushels, and the peanuts, 500 pounds. Sugarcane yields 200 to 250 gallons of sirup an acre; lima beans, 100 crates; string beans, 110; cucumbers, 160; eggplant, 135; peppers, 175; okra, 175; and squash, 140 crates. Green corn for market yields well, and cabbage produces about 8 tons an acre. Some sweetpotatoes, velvetbeans, and other crops are grown. All the vegetables are given heavy applications of complete fertilizer and some of them are given a top dressing of nitrate of soda.

Fellowship loamy fine sand, rolling phase (FB).—This phase differs essentially from the undulating phase in that it occupies slopes of 7 to 15 percent and in many places has a thinner surface covering of loamy fine sand. In places erosion has removed all of the original surface soil and exposed the fine sandy clay loam or clay. There is usually a noticeable quantity of chert gravel and cobbles scattered over the surface. Areas occur in the northwestern and west-central parts of the county in close association with Arredondo, Gainesville, and other Fellowship soils.

About 3½ miles south of Gainesville this phase includes a small area of Fellowship clay loam, which has a medium-gray fine sandy clay loam or clay loam surface soil and a gray-and-brown mottled heavy clay subsoil. Round fragments of arenaceous rock, ranging in size from 1 to 12 inches, are strewn on the surface and are present to some extent throughout the profile.

Use and management.—Perhaps not more than 10 percent of Fellowship loamy fine sand, rolling phase, is cultivated. Probably 75 percent is forested with hardwoods and loblolly pine, and about 15 percent is in pasture. This soil is farmed in conjunction with the undulating phase, but yields are reported to be about 10 to 20 percent lower with the same fertilization and similar practices. Because of the steepness of slopes, cultivation is not so easy as on the undulating phase. Under clean cultivation sheet erosion is severe because of the slopes and heavy subsoil. Erosion has caused galled spots by re-

moving the surface layer of loamy fine sand where the soil is cultivated. Strip cropping should be practiced to prevent further erosion. Moisture conditions are fairly favorable, and where the surface has not been eroded the soil is well suited to pasture grasses.

Fellowship gravelly loamy fine sand, undulating phase (FA).—This phase occurs in small areas south of Alachua on ridges, upper slopes, and knolls. It differs essentially from the Fellowship loamy fine sand in that arenaceous rock or chert fragments cover the surface and are mixed with the soil. Locally the larger fragments are so numerous the soil is unsuitable for clean-cultivated crops. Such areas are indicated on the map by stone symbol. In practically all areas the gravelly or cherty material interferes with cultivation. All areas are naturally well drained on the surface, but internal drainage is slow owing to the heavy subsoil. The gravel on the surface aids in preventing erosion.

Use and management.—Part of Fellowship gravelly loamy sand, undulating phase, has been cleared and either cultivated or used for pasture. The uncleared areas support a growth of hardwoods and loblolly pine. Permanent pasture in conjunction with forestry is recommended.

FORT MEADE SERIES

The Fort Meade soil is derived from beds of fine sand resting on and partly mixed with material developed from pebble phosphate beds or phosphatic limestone. Evidence of mixing is shown by the high phosphate content of the soil. Fort Meade soil is associated with Gainesville, Arredondo, and Fellowship soils and borders areas of Lakeland and Orlando soils. It is darker brown and much sandier than Gainesville soils, darker than the Arredondo, and coarser textured and better drained than the Fellowship. All areas have favorable relief and are well drained. Only one type, Fort Meade loamy fine sand, is mapped in the county.

Fort Meade loamy fine sand (FD).—This soil resembles the Orlando soil in surface appearance but differs slightly from it in subsoil color and in its higher phosphorus content. It occurs mainly in the northwestern part of the county, the largest areas being near High Springs, Alachua, and Santa Fe. The surface relief is undulating to gently sloping, but some areas are level and higher than the Gainesville and Arredondo soils. Natural surface and internal drainage are both good.

Profile description:

0 to 6 inches, dark-gray or grayish-brown nearly loose loamy fine sand containing a considerable quantity of organic matter that is well united with mineral particles.
6 to 25 inches, brownish-gray nearly loose loamy fine sand.
25 to 70 inches +, brownish-gray or yellowish-brown nearly loose loamy fine sand containing lenses of fine sandy loam.

The surface soil varies from 4 to 12 inches thick. Locally small impure phosphatic pebbles are present. In a few places small areas of Fort Meade fine sand (not mapped in the county) are included.

Use and management.—Fort Meade loamy fine sand is a good agricultural soil. It has a wide crop adaptation, including general farm crops and truck crops. It is easy to till and responds readily to good management practices. About 75 to 80 percent of this soil is cropped.

The rest supports a growth of red, live, and willow oaks, hickory, dogwood, sweetgum, magnolia, and loblolly and longleaf pines. Where general farm crops are produced, management practices and fertilization are similar to those given Gainesville loamy fine sand, undulating phase. Where truck crops are grown, the practices and fertilization are similar to those on Scranton loamy fine sand-fine sand.

Corn yields 18 to 30 bushels an acre; peanuts, 600 pounds; cotton, 250 pounds; and sugarcane, 200 to 275 gallons. These crops receive about the usual fertilization. Peppers yield 190 crates an acre where the soil receives 1,200 to 1,600 pounds of fertilizer and a side dressing of 200 to 400 pounds of nitrate of soda. Some cabbage, string beans, green corn, cucumbers, eggplant, and other truck crops are grown, and yields are satisfactory.

GAINESVILLE SERIES

Soils of the Gainesville series have formed from thin beds of fine sand and fine sandy loam, partly mixed with material developed from underlying limestone that may or may not be phosphatic. The lower subsoil seems to originate from limestone. This series is associated with the Arredondo, Fellowship, and Fort Meade series. Gainesville soils are readily recognized by their brown or reddish-brown color, which distinguishes them from the lighter colored Arredondo soils and the gray or brownish-gray soils of the Fellowship and Fort Meade series. Gainesville-Arredondo loamy fine sands and the undulating and rolling phases of Gainesville loamy fine sand are mapped.

Gainesville loamy fine sand, undulating phase (Gc).—This medium acid soil occurs in close association with the Arredondo, Fellowship, and Fort Meade soils, mainly in the northwestern part of the county, and particularly near Alachua. It differs from these soils in being browner throughout both surface soil and subsoil. The surface relief (2- to 7-percent gradient) ranges from undulating to gently rolling, with some long gentle slopes. This relief is broken to some extent by numerous limestone sinks (pl. 5, *A*). Both surface and internal drainage are good.

Profile in a cultivated field:

0 to 8 inches, brown to brownish-gray nearly loose loamy fine sand.
8 to 15 inches, weak- to moderate-brown nearly loose loamy fine sand.
15 to 30 inches, yellowish-brown or weak reddish-brown friable fine sandy loam.
30 to 60 inches +, moderate to strong reddish-brown friable fine sandy clay.

Below the surface layer of loamy fine sand there is a gradual increase in clay content with depth down to 5 or 6 feet. The texture of the deeper material ranges from fine sandy loam to fine sandy clay. About 20 percent of the total area consists of loamy fine sand or light-textured friable fine sandy loam that extends to a depth of 8 to 12 inches before it gives way to reddish-brown fine sandy clay loam. In wooded or virgin areas the upper 3 or 4 inches of Gainesville loamy fine sand, undulating phase, is dark grayish-brown or dark-gray loamy fine sand containing considerable organic matter. The loamy fine sand ranges from 12- to 30-inches thick over fine sandy loam or fine sandy clay. Texture varies, and both the surface soil and subsoil vary in color, depending on whether the soil grades to Arredondo soil or to Fort Meade and Fellowship soils.

Use and management.—Gainesville loamy fine sand, undulating phase, is an important agricultural soil and one of the most productive of a wide range of crops. Owing to its friable subsoil, plant roots can easily penetrate. Old root channels are noticeable to a depth of several feet in many places. The soil absorbs rainfall readily and its moisture-holding capacity is relatively high. Practically all of it is favorable to cultivation with improved machinery. About 70 or 80 percent of the soil is cultivated; some is in permanent pasture; and the rest is forested with longleaf and loblolly pines and hardwoods, such as red and live oaks, hickory, magnolia, and sweetgum. Corn, peanuts, velvetbeans, and cotton are well suited, and truck crops and permanent pasture grasses are fairly well suited.

About 40 percent of the cultivated land is planted to corn, intertilled with peanuts and velvetbeans, and a small percentage is planted to corn alone. The prevailing farm practice on Gainesville loamy fine sand, undulating phase, consists of planting alternate rows of corn and peanuts or two rows of corn and one row of peanuts with velvetbeans every 4 feet in the corn row. Little or no commercial fertilizer is used in this practice. After the corn is gathered, hogs and cattle are turned into the field to fatten on the peanuts and velvetbeans. Where peanuts are grown alone, the yields are 600 to 700 pounds an acre. Where corn is grown alone, some of the farmers use 200 to 300 pounds of 4–7–5 mixture an acre at planting time and 100 to 150 pounds of nitrate of soda as a side dressing when the corn is about 18 to 24 inches high. Corn yields 25 to 40 bushels an acre. Some of the farmers apply 10 or 15 pounds of zinc sulfate an acre to the soil used for corn in order to prevent whitebud. A volunteer growth of native grasses and weeds naturally follows a harvested crop, and the field remains idle for a year and is then planted again to corn, peanuts, and velvetbeans.

The yields of cotton, hay, green corn, sugarcane, sweetpotatoes, and other vegetables are satisfactory where liberal applications of fertilizer are used. Tung trees and pecans do well if zinc sulfate is included in the fertilizer. Crotalaria, velvetbeans, and cowpeas do well. Kudzu is recommended for the more sloping areas where sheet erosion is noticeable, for it checks erosion and also adds much high-quality organic matter to the soil.

Gainesville loamy fine sand, rolling phase (GB).—This phase differs essentially from the undulating phase in having greater slopes, which are from 7 to 15 percent in gradient, and in having lost some of the original surface soil by sheet erosion. It occurs in small areas near Alachua in close association with the undulating phase and with Fellowship soils. It is farmed in conjunction with them. Small areas of fine sandy loam are included.

Use and management.—Owing to the steep slopes, probably less than 30 percent of Gainesville loamy fine sand, rolling phase, is cultivated at present. The yields are 20 percent or more lower than on the undulating phase, largely because of sheet erosion. Terracing, strip cropping, and other erosion controls should be practiced to protect the soil from further surface washing. It would be best to use this land for permanent pasture or have it in a rotation where clean-cultivated crops are grown only 1 in every 3 to 5 years. The content of organic matter would thereby be increased, the moisture-holding capacity improved, and larger yields obtained.

Gainesville-Arredondo loamy fine sands (Ga).—This complex consists of areas of representative Gainesville loamy fine sand, definite but small areas of Arredondo loamy fine sand, and a gradation between these two soils. The greater part of the complex is Gainesville loamy fine sand. This land occurs in large areas extending northwest from the vicinity of Alachua to within 2 miles northeast of High Springs in the central and northwestern part of the county. It is on broad undulating to gently sloping ridges, mainly with long smooth slopes. Both surface and internal drainage are good. Many limestone sinks occur, and the intermittent drainageways lead to them. Most of the drainage is through underground channels. Good moisture conditions prevail during the greater part of the growing season.

The Gainesville loamy fine sand part of this complex consists of a light-brown or brown nearly loose loamy fine sand to depths of 8 to 10 inches. This layer is underlain by yellowish-brown or weak reddish-brown nearly loose loamy fine sand, which extends to a depth of 40 inches. Between a depth of 40 and 60 inches the material consists of yellowish-brown friable fine sandy loam, and below this depth is yellowish-gray or yellowish-brown fine sandy clay. This loamy fine sand differs essentially from Gainesville loamy fine sand undulating phase, in that the heavier textured material lies at much greater depth below the surface. In some places, however, it is somewhat difficult to draw a boundary between these two soils.

The Arredondo loamy fine sand part of this complex has light-brown or grayish-brown nearly loose loamy fine sand surface soil to depths of 6 to 10 inches. This is underlain by light yellowish-brown to pale-yellow nearly loose loamy fine sand extending to depths of 40 or 50 inches. Below this layer is mottled pale-brown, yellowish-brown, and gray friable fine sandy loam. Arredondo loamy fine sand becomes lighter in color as it grades to the Lakeland soils. It occupies an intermediate position in color and texture between Lakeland fine sand and the representative Gainesville loamy fine sand.

Use and management.—Crops, management practices, and fertilization are about the same on Gainesville-Arredondo loamy fine sands as on Gainesville loamy fine sand, undulating phase, and the yields of most crops are almost as good. Tung trees and pecans do well where properly fertilized. Crotalaria, kudzu, and blue lupine do exceptionally well. These soils are very easy to till, warm early in spring, have fairly good moisture conditions, and respond readily to commercial fertilizer and to the turning under of green-manure crops.

HERNANDO SERIES

The Hernando series has formed from thin beds of acid sand overlying sandy clay over limestone. The sandy clay layer shows evidence of having been developed from limestone, and locally, weathered material from the limestone is mixed with the overlying sand. Relief is favorable, and drainage is naturally good. The Hernando series is associated with and closely related to the Jonesville, Archer, Chiefland, and Fellowship. In the Hernando soil the sandy material is 6 to 30 inches thick over sandy clay, whereas in the Jonesville it is 30 to 60 inches thick. The Hernando soil differs essentially from the Archer in that the sandy material of the Archer series is underlain by yellowish-brown or reddish-brown heavy sandy clay over limestone. The Chiefland soil lacks the sandy clay layer over the

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limestone. The Hernando soil is readily distinguished from Fellowship soils by its lighter color and better drainage.

Hernando-Jonesville fine sands (HA).—This complex is closely associated with Jonesville-Hernando fine sands and Archer-Jonesville fine sands. Areas occur in the southwestern and west-central parts of the county. Approximately seventy to seventy-five percent of this complex is Hernando fine sand. The relief is nearly level to undulating to very gently sloping (pl. 5, *B*) and all areas are favorable for agricultural operations. Both surface and internal drainage are good. Numerous and usually shallow limestone sinks are scattered over the area, and the excess rain water finds its way to underground channels.

Profile of Hernando fine sand in a wooded area about 2 miles east of Newberry:

0 to 4 inches, light brownish-gray loamy fine sand containing considerable organic matter.
4 to 18 inches, yellow or light yellowish-brown nearly loose loamy fine sand or fine sand.
18 to 24 inches, light yellowish-brown friable fine sandy loam.
24 to 36 inches, light yellowish-brown friable but slightly sticky fine sandy clay.
36 to 38 inches, yellowish-brown calcareous fine sandy clay.
38 inches +, Ocala limestone.

In cultivated fields the surface soil is yellowish gray, pale yellow, or light grayish brown. The principal variation is in the depth of fine sandy material over sandy clay or sandy clay loam. Depth ranges from 6 to 30 inches within short distances. Locally there are areas of loamy fine sand and a few spots of light-textured sandy loam. The clay layer over limestone ranges from a few inches to several feet thick.

The Jonesville fine sand component of this complex occurs indiscriminately in Hernando fine sand and differs from it in that the sandy material is 30 to 60 inches or more thick over sandy clay. These Jonesville areas are small and intricately associated and not of sufficient size to be shown on the map.

Included in mapping are areas of soil similar in the surface layer to the Hernando but having a subsoil or underlying material of mottled light-gray and brown plastic sandy clay. This lower material has all of the characteristics of the subsoil of the Fellowship series. These areas are scattered throughout the Hernando fine sand of the complex in the southwestern part of the county.

Use and management.—Hernando-Jonesville fine sands are considered among the best soils in the county. They can be built up to and maintained at a fair to high state of productivity much easier than the deeper sands in the Jonesville-Hernando fine sands. On the Hernando soil areas fairly good pastures can be developed.

The Hernando fine sand of this complex is one of the best soils in the county for peanuts, bright tobacco, and watermelons. It is fairly well suited to cotton, sugarcane, sweetpotatoes, corn, and velvetbeans. Most of this soil is cleared and cultivated. Fairly good pastures could be developed.

Yields of crops depend upon the quantity of fertilizer applied and the management of the soils. Tobacco yields 800 to 1,000 pounds an acre where the soil is fertilized with 800 to 1,200 pounds an acre of 3–8–5, 3–8–8, or 4–8–6. Peanuts yield 850 pounds an acre and are

given only a light application of fertilizer. Corn yields 15 to 25 bushels and is usually given a light application of commercial fertilizer and a side dressing of 100 pounds of nitrate of soda or sulfate of ammonia when the plants are about 18 to 24 inches high. Watermelons produce about half a carload or more an acre, and the soil is given 600 to 800 pounds of 4–7–5 fertilizer and 100 pounds of nitrate of soda as a top dressing. Sweetpotatoes give good yields where the soil is fertilized with 800 to 1,000 pounds of 3–8–5 or 3–8–8 mixture.

The yields on the Jonesville fine sand areas in this complex are slightly less than those given above and are discussed under the Jonesville-Hernando fine sands complex.

JAMISON SERIES

Soil of the Jamison series is in depressions or on lower slopes. It occurs in close association with Lakeland, Hernando, Archer, and Jonesville soils and consists of colluvial-alluvial material washed or sloughed from them.

Jamison loamy fine sand (JA).—This soil differs from Alachua loamy fine sand in having a lighter color throughout the profile and in being derived, for the most part, from different soil material. It is formed from recent accumulations of material washed from Hernando, Lakeland, Jonesville, Archer, and Blanton soils. These materials have accumulated at or near the base of slopes. The relief is almost level, and both surface and internal drainage are moderately good. The numerous small areas occur largely in the southwestern part of the county.

The surface soil to depths of 8 to 12 inches consists of yellowish-gray nearly loose loamy fine sand and fine sand containing a small quantity of organic matter. This grades into pale-yellow, yellowish-gray, or light brownish-yellow nearly loose loamy fine sand, which continues downward to depths of 20 to 50 inches. The surface soil is strongly acid, whereas the underlying material ranges from strongly acid to medium acid. Where areas border some of the poorly drained soils, the drainage is imperfect and the subsoil is mottled with light gray. In the mapping of this soil, spots of poorly drained soils too small to be separated are included.

Use and management.—Jamison loamy fine sand is a fair to good agricultural soil. About 80 percent of it is cultivated, and the rest supports a growth of longleaf and loblolly pines, sweetgum, magnolia, and water, turkey, and live oaks.

Because of its small areas this soil is farmed with the associated soils on adjacent slopes. It has a higher natural fertility than the associated soils and is considered better for sugarcane and corn because of better moisture conditions, but it is not so good for peanuts, tobacco, and watermelons. Yields are emphasized for sugarcane and corn, but quality is more important for peanuts, tobacco, and watermelons.

JONESVILLE SERIES

The Jonesville series is composed of yellowish-gray to yellow to pale-brown sand and a layer of sandy clay over limestone. The soil has formed from moderately thick beds of acid sand overlying finer sediments that rest on limestone. Some weathered material from the limestone may be mixed with the overlying sand. The soil has a

favorable surface relief and is well to somewhat excessively drained. The Jonesville series is associated with the Hernando, Archer, and Chiefland series. It is similar in color to the Lakeland series, but Lakeland soils lack the sandy clay and limestone. In the Jonesville soil the average depth of sandy material over clay or sandy clay exceeds 30 inches, whereas in Hernando and Archer soils it is less than 30 inches. The Jonesville soil is not so gray as the Chiefland, which lies on limestone. In this county Jonesville soil occurs in complexes with Hernando and Archer soils, not as an individual mapping unit.

Jonesville-Hernando fine sands (JB).—This complex has a nearly level to undulating or very gently sloping surface. Small areas near Cadillac have slopes ranging from 7 to 15 percent. Both surface and internal drainage are very good. Numerous limestone sinks are throughout this land and the rain water finds its way to these sinks and through underground channels. Areas occur in the western half of the county, and in many places lie between areas of Arredondo and Gainesville soils on the east and Lakeland soils on the west. Jonesville fine sand comprises 70 percent or more of the complex. It is lighter in color than Arredondo or Gainesville soils and is somewhat similar in appearance to the Lakeland.

Profile of Jonesville fine sand in a wooded area:

0 to 1 inch, dark-gray loose fine sand containing considerable organic matter.
1 to 5 inches, yellowish-gray loose fine sand.
5 to 40 inches, light yellowish-brown or yellow loose fine sand.
40 to 44 inches, light yellowish-brown friable heavy fine sandy loam or fine sandy clay.
44 inches +, Ocala limestone.

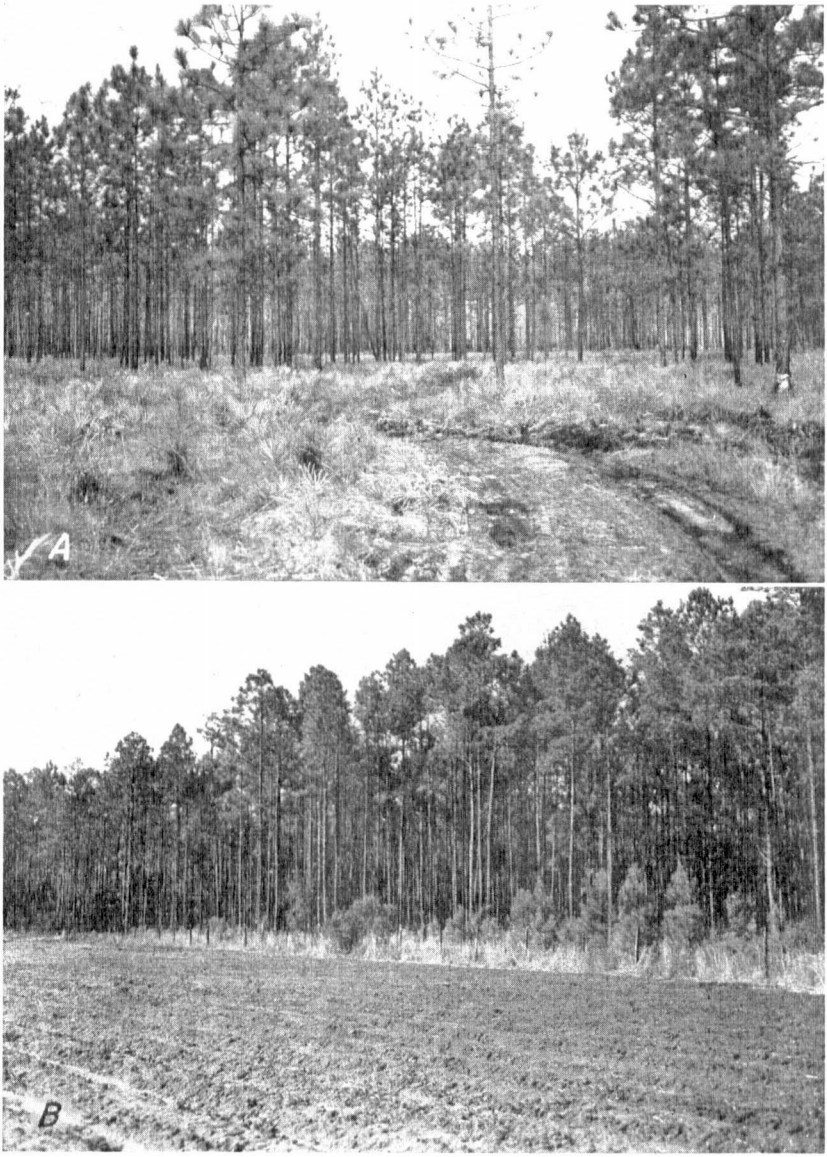
In cultivated fields the surface soil is light brownish gray, pale brown, or yellowish gray. The depth to limestone may range from less than 3 feet to as much as 8 or 10 within a short distance. In many places gray heavy clay 1 to 10 inches thick overlies limestone; in other places yellowish-brown or reddish-brown moderately heavy sandy clay of variable thickness overlies the limestone. In a few places, particularly those bordering Chiefland fine sand, the fine sand rests directly on limestone. A few areas 4 to 8 miles west and southwest of Gainesville have irregular-shaped fragments of chert, 1 to 12 inches in diameter, on the surface and mixed throughout the soil.

In the areas of Hernando fine sand included in this complex the fine sandy loam or fine sandy clay subsoil is reached anywhere between 12 and 30 inches below the surface.

Use and management.—About 60 percent of Jonesville-Hernando fine sands is cleared. The rest is forested with longleaf pine and some hardwoods. Of the cleared land under cultivation, about 40 percent is used for interplanted corn, peanuts, and velvetbeans. Some of the soil is used for corn alone and some for peanuts alone. A smaller percentage is planted to tobacco, watermelons, sea-island cotton, and other crops, such as okra, cucumbers, chufas, and cowpeas. About a third of the land is idle each year.

A common practice is to interplant corn, peanuts, and velvetbeans for 2 or 3 years in succession and then allow the land to rest for a year. On rested land grasses and other weeds come up and provide some pasture. They are then plowed under for another crop of corn,

A, Landscape of Gainesville and Alachua soils; the lower lying darker areas are Alachua; trees at right mark sinkhole.
B, View of Hernando-Jonesville and Jamison soils; the lighter colored and larger areas are Hernando-Jonesville; trees in center around sinkhole.



A, Longleaf and loblolly pines and dense undergrowth of saw-palmetto on Leon fine sand.
B, thick stand of loblolly and slash pines in Scranton loamy fine sand-fine sand.

peanuts, and velvetbeans. The rotation used by tobacco farmers is tobacco the first year, an intertilled crop of corn, peanuts, and velvetbeans the second year, and fallow land the third year. The following year tobacco may be grown again.

Tobacco yields 800 to 1,000 pounds an acre where 800 to 1,200 pounds of 3–8–5, 3–8–8, or 4–8–6 mixture has been applied to the soil. Watermelons yield ⅓ to ½ a carload an acre where 600 to 800 pounds of 4–7–5 mixture is applied before planting and about 100 pounds of nitrate of soda fertilizer is used as a top dressing. Cotton yields about 200 to 300 pounds where the soil is fertilized with 300 to 400 pounds 3–8–5 or 4–7–5 mixture an acre. Sweetpotatoes give fair yields and are usually fertilized with 800 to 1,000 pounds of 3–8–8 mixture an acre or with stable manure in large quantities. Corn, where planted alone, yields 15 to 25 bushels an acre, the higher yield being obtained if 100 pounds of nitrate of soda or sulfate of ammonia is applied when the plants are about 18 to 24 inches high. Peanuts yield 700 to 900 pounds an acre. Where corn and peanuts are grown together, the yields are about 10 bushels of corn and 600 to 800 pounds of peanuts. Sugarcane, sweetpotatoes, okra, cucumbers, and other crops do fairly well when heavily fertilized.

Since Hernando fine sand occurs in small areas in Jonesville fine sand, it is farmed in the same way. Under similar fertilization and management practices, however, the yields on Hernando fine sand are 10 to 15 percent higher than on the Jonesville soil.

This soil complex is deficient in organic matter and can be greatly improved by growing and turning under suitable leguminous cover crops, such as crotalaria, beggarweed, and cowpeas.

KANAPAHA SERIES

The soils of the Kanapaha series have formed from thin beds of sand over sandy clay or limestone. The soils are associated with Gainesville, Fellowship, Arredondo, Blanton, and Bladen soils. They differ from the Blanton in having gray or dark-gray surface soil and lighter colored subsoil and in being underlain by limestone or sandy clay. They are not so well drained as Arredondo or Gainesville soils but are better drained than the Bladen. Kanapaha soils have a characteristic hammock growth and have in some areas previously been classed as Blanton fine sand, hammock phase. Kanapaha fine sand and Kanapaha-Bladen complex are mapped in the county.

Kanapaha fine sand (Kb).—The largest areas of this soil occur in the southeastern part of the county, but many smaller ones are scattered throughout areas of Arredondo, Fellowship, and Bladen soils in the southern and southwestern parts. The relief is level or nearly level to slightly undulating. In places the soil lies adjacent to lakes, ponds, and swamps. Both surface and internal drainage are usually good, but in some places the internal drainage is imperfect because of the relatively low position of the soil and the high water table. The water-holding capacity of this soil is relatively low because of its coarse-textured material.

In a wooded area this soil consists of a gray or dark-gray loose fine sand to depths of 3 to 5 inches and contains a variable quantity of organic matter. The organic matter quickly disappears under cultivation, and the surface soil becomes light gray. The surface soil is

underlain at depths of 40 to 50 inches by light-gray or yellowish-white loose fine sand. Beneath this is mottled light-gray and brown fine sandy clay or limestone. Locally the limestone rock is within 50 or 60 inches of the surface. The surface soil and subsoil are strongly acid.

Small areas of medium-textured sand occur near Island Grove and Lake Lochloosa. To the south of Gainesville and near Micanopy are areas of this soil that are imperfectly drained in the lower part of the 3-foot section. Locally a few chert fragments, rounded gravel, or cobbles are scattered over the surface and mixed through the surface soil and subsoil. In places are included small areas of Arredondo loamy fine sand and Bladen loamy fine sand (not mapped in the county).

Use and management.—About 5 percent of Kanapaha fine sand is cultivated, and the rest supports a hammock growth of live oak, magnolia, hickory, sweetgum, bay, and loblolly pine. Near Cross Creek, this soil is used to some extent for citrus, and in other places vegetables are grown. All crops receive heavy fertilization, and the agricultural practices are similar to those in use on the Lakeland and Blanton fine sands. Suggestions offered for the improvement of the Lakeland fine sand phases would apply equally well to Kanapaha fine sand. Perhaps the best use for this soil is forestry, although some crops and pasture grasses can be grown.

Kanapaha-Bladen complex (Ka).—This complex consists of areas of Kanapaha fine sand and Bladen loamy fine sand so intricately associated and mixed that the individual units could not be mapped separately on the scale used. The relief is level, nearly level, or very gently undulating. Generally both surface and internal drainage are poor; small areas of each unit are moderately well to imperfectly drained.

Kanapaha fine sand has been described previously. The surface layer of Bladen loamy fine sand to depths of 6 to 10 inches is gray or grayish-brown nearly loose loamy fine sand containing a fair quantity of organic matter. This layer grades to yellowish-gray or light-gray, mottled with brown or yellow, nearly loose but slightly sticky loamy fine sand, which is underlain at 30 to 40 inches by a mottled gray and brown plastic fine sandy clay loam.

There is considerable variation in the color and consistence of the Bladen lower subsoil from place to place. In the western part of the county the loamy fine sand or fine sand is deeper than 3 feet and is pale brown or pale brown mottled with gray. Included are small spots of Leon fine sand and also small areas of Bladen loamy fine sand where the fine sandy clay loam is near the surface. These areas are better drained than Bladen soils in the southeastern part of the county.

Use and management.—About 10 to 15 percent of the Kanapaha-Bladen complex is cleared, drained, and used for crops. The rest is forested with live oak, magnolia, maple, hickory, sweetgum, and some loblolly and longleaf pines. Kanapaha fine sand has the characteristic hammock growth. In places there is an undergrowth of wiregrass and other natural grasses, which afford scant pasture.

Artificial drainage is necessary over the greater part to reclaim these soils for cultivated crops, but slight drainage is required for pasture grasses. When drained this complex warms early in spring, is very easy to cultivate, and responds readily to fertilization and to the addition of organic matter. Since the soils have much thicker sandy layers

over sandy clay than Bladen loamy sand, the yields under similar treatment are somewhat lower. Yields in Kanapaha fine sand are lower than those on Bladen loamy fine sand. Truck crops, corn, and pasture grasses do well. These soils are strongly acid and require lime and fertilizer for pasture grasses.

LAKELAND SERIES

The soils of the Lakeland series, formerly mapped as Norfolk soils, have formed from moderately thick beds of acid sand and loamy sand overlying sandy loam and sandy clay. This series is associated with the Blanton and Jonesville series. Lakeland soils are pale yellow to light yellowish brown as compared with the light-gray Blanton, and they are somewhat better drained. Although Lakeland soils resemble the Jonesville in color, they differ essentially from them in that the Jonesville soil is underlain by a layer of sandy clay or clay over limestone and is closely associated with the Hernando and Archer soils. Lakeland soils have nearly level to hilly surfaces with gradients up to 20 percent, and they are somewhat excessively drained.

Lakeland fine sand, undulating phase (LB).—Areas of this phase are fairly well distributed over the county, but the largest ones occur in the western and northwestern parts. The surface is nearly level or undulating to very gently sloping or gently rolling. Most of the soil is on low broad ridges with slopes of 1 to 3 percent, but the extreme range is from 0 to 7 percent. Drainage is good to somewhat excessive. The open and porous character of both the surface soil and subsoil allow rapid penetration of rain water. There is little runoff except on some of the steeper slopes. The slight erosion on some of these slopes may be due in part to wind action.

Profile in a cultivated field:

0 to 6 inches, pale-brown to yellowish-gray loose fine sand with a low content of organic matter; strongly acid.
6 to 60 inches, yellow to light yellowish-brown loose fine sand, which in the lower part has a slightly loamy feel; strongly acid.
60 to 70 inches, pale-yellow or yellowish-gray loose to very loose fine sand; strongly acid.
70 inches +, mottled light-gray, yellow, and yellowish-brown friable fine sandy clay loam; strongly acid.

In wooded areas the surface soil to depths of 2 to 4 inches is a brownish gray fine sand with a high content of loose organic matter. The color of the surface soil for all areas is influenced by the content of organic matter. The subsoil is pale yellow to yellowish brown, being lighter as it grades toward Blanton and browner as it grades toward Arredondo and Gainesville. The depth of the fine sand over the heavier sediments is 40 to 90 inches, the areas with the deeper sand being the least productive. Four miles west of Gainesville is a small area where irregular-shaped fragments of chert, ranging from a few inches to 2 feet or more in diameter, are scattered over the surface and through the soil. They interfere with cultivation where abundant.

Included with this phase are small areas of Lakeland loamy fine sand. The inclusions have a loamy texture and the finer sediments are reached anywhere between 30 and 60 inches below the surface. The loamy fine sand occurs mainly in the eastern and southwestern parts of the county, usually in or adjoining areas of Lakeland fine

sand, undulating phase. It has slightly better moisture conditions than the fine sand. The crops grown and management practices are about the same, but the yields are 10 to 15 percent higher.

In a few places in the western and northwestern parts of the county, the relief is 6 to 12 percent. These more steeply sloping areas occur within the larger areas of Lakeland fine sand, undulating phase, and could not well be separated on the map. Compared with the undulating phase, these areas usually have a lower organic-matter content, have a less favorable moisture condition, are more subject to sheet erosion, and have slightly lower crop yields under similar management practices.

Use and management.—Lakeland fine sand, undulating phase, is an important agricultural soil. About 30 percent of it is cultivated, and a considerable acreage is abandoned or idle. The rest supports a scattering growth of longleaf pine and blackjack and scrub oaks. Natural grass consists mainly of wiregrass. About half of the cultivated land is used for intertilled crops of corn, peanuts, and velvetbeans, and a small percentage is used for peanuts or corn alone. Some bright tobacco, watermelons, oats, cowpeas, sweetpotatoes, sea-island cotton, cucumbers, okra, cantaloups, and sugarcane are grown. Several hundred acres are planted to tung trees and a small acreage to pecans.

It is a common practice to plant, with little or no fertilizer, corn and peanuts in alternate rows and velvetbeans every 4 or 5 feet in the corn row. After the corn is harvested, hogs and cattle are turned into the field. Corn yields 10 to 18 bushels an acre, and peanuts, about 600 to 700 pounds. A volunteer growth of crotalaria, beggarweed, grasses, and other weeds succeeds these crops. After the land has remained idle or has rested for a year, the field is again used for intertilled crops. Where corn is grown alone, it may or may not be fertilized. If fertilized, 200 to 400 pounds of a complete fertilizer, such as 4–7–5, in the row and 100 to 150 pounds of nitrate of soda or ammonium sulfate as a side dressing may be used.

Watermelons are usually planted on newly cleared land or on land that has not been in watermelons for several years. This crop is fertilized with 600 to 800 pounds of 4–7–5 mixture an acre, and yields are ⅓ to ½ a carload an acre. The land used for tobacco is given 800 to 1,200 pounds of 3–8–5, 3–8–8, or 4–8–6 mixture an acre, and the yield ranges from 700 to 800 pounds. Sugarcane, sweetpotatoes, cucumbers, other truck crops, cowpeas, hay, velvetbeans, and other crops are grown. The yields are generally low except where the soil is heavily fertilized and the seasons are favorable.

The quantity of fertilizer applied to the soil where tung trees are grown depends upon the age, size, and condition of the trees. The most commonly used fertilizer for tung trees has been 5–7–5 mixture applied at the following annual rate for each tree, according to age: 1 year old, ½ to 1 pound; 2, 3, and 4 years, 1 to 2 pounds; 5 and 6 years, 2 to 4 pounds; 7 and 8 years, 4 to 8 pounds; and 9 and following years, 10 to 12 pounds. Two applications of fertilizer are given, one in March and one in June. Most growers apply zinc sulfate to prevent bronzing, using 1 to 2 ounces a tree annually in groves under 4 years old and about 4 ounces a tree every other year in older groves.

In this soil there is a rapid loss of organic matter and of any soluble fertilizer that has not been used by the growing crops. By growing

and turning under green-manure crops, the organic-matter content and the moisture- and plant food-holding capacities may be greatly improved.

Lakeland fine sand, deep phase (La).—This excessively drained soil covers approximately one township in the southwestern part of the county. Its dunelike topography of choppy ridges and knolls with short abrupt slopes (5- to 20-percent gradient) distinguishes it from other soils (pl. 4, *B*). The characteristic growth consists of small blackjack and turkey oaks with an occasional longleaf pine and a scant growth of wiregrass.

The surface soil is pale-yellow loose to very loose fine sand 4 to 8 inches thick. It is underlain by pale-yellow or yellow very loose fine sand, which grades at about 40 to 60 inches into a light-gray or pale-yellow very loose fine sand. This continues downward to depths of 8 to 20 feet or more, where it is underlain by mottled light-gray, yellow, pink, and reddish-brown friable sandy clay loam or sandy clay. All layers in this profile are very strongly acid.

Use and management.—Lakeland fine sand, deep phase, is unsuited to the crops grown in the county. Cattle confined to the open range on this soil suffer from salt sickness, probably because the sparse native grasses, mainly wiregrass, furnish but little nourishment. Plantings of pine may do fairly well.

LEON SERIES

The Leon soil has developed from moderately thick beds of acid sand and clay under influence of a high water table. It is characterized by the presence of an organic hardpan layer within 30 inches of the surface. This layer has apparently developed at approximately the average ground water level. The soil is associated with Blanton, Plummer, and Rex soils but is better drained and much lighter colored in the layers above the hardpan than the Plummer soil and not so well drained as Blanton and Rex soils. Drainage is imperfect to poor, and the relief ranges from level to nearly level. Leon fine sand is mapped in this county.

Leon fine sand (Lc).—This soil occurs in large continuous areas in the eastern half, or the level pineland part, of the county, particularly between Gainesville, La Crosse, and Waldo, and in the southeastern part of the county. The surface is level to nearly level with very gentle slopes in places. Both the surface and internal drainage are imperfect to poor. The hardpan layer retards both the downward movement of percolating water and the upper movement of capillary water.

Profile (pl. 3, *B*) in a virgin area:

0 to 4 inches, medium-gray nearly loose fine sand containing some grass roots and many long large roots of saw-palmetto; very strongly acid.

4 to 18 inches, white or yellowish-white loose fine sand; very strongly acid.

18 to 21 inches, black or very dark-brown hardpan consisting of fine sand cemented with organic matter; hardens on exposure to air and becomes extremely hard but brittle when dry; firm to friable when moist; contains coarse vegetable matter; very strongly to extremely acid.

21 to 26 inches, dark-brown partly cemented fine sand; upper 1 or 2 inches is moderately hard but brittle, and the rest is friable; very strongly acid.

26 to 32 inches, yellowish-brown loose fine sand usually saturated with water; strongly acid.

32 to 60 inches, light-gray loose fine sand with streaks of brown or dark gray; usually wet; strongly acid.

The fine sand over the hardpan layer varies from 10 to 30 inches in thickness, and in the deeper areas locally approaches Blanton fine sand or St. Lucie fine sand in color. There is considerable variation in the hardpan layer within short distances—in some places it is thick, hard, and black, whereas in others it is soft and brown. The soft condition raises the question of whether the hardpan is forming or losing its compactness. Locally two or more successive hardpan layers may occur in the profile where the sandy clay parent material lies at depths of several feet below the surface. In some places there are seams, streaks, or tongues of dark-brown organic matter extending into the light-gray fine sand substrata.

In the eastern part of the county and in a few other locations, small areas are underlain by a mottled light-gray and brown fine sandy loam or fine sandy clay at depths of 3 to 4 feet below the surface. They support a larger and greener growth of saw-palmetto, have somewhat better moisture conditions, and may be considered slightly better agriculturally than the representative Leon fine sand.

Combined with Leon fine sand are a number of small areas in the eastern part of the county that would have been recognized as St. Johns fine sand (not mapped in the county) had they been larger. St. Johns fine sand is a very dark-gray or nearly black fine sand that has a high organic-matter content and ranges in depth from 6 to 10 inches. Below this, the profile is similar to Leon fine sand. It is very poorly drained; water stands on the surface part of the time and the soil is usually saturated. In places the texture is a medium sand, and in areas bordering Peat the soil is mucky sand. The forest growth is mainly slash and pond pines.

Use and management.—Practically none of Leon fine sand is cultivated. Water control, including irrigation and drainage, is essential for successful cultivation. The principal soil use is for forestry and range pasture. The tree growth is mainly longleaf and slash pines, which afford saw timber, cross ties, and poles. A dense stand of short (1 to 3 feet) saw-palmetto is conspicuous on all areas (pl. 6, *A*). There are also some gallberry, huckleberry, running oak, wiregrass, other grasses, and myrtle in the low places.

Production of timber, turpentine, and other naval stores can be profitable. With particular attention given to reproduction, care of young trees, fire prevention, careful boxing for turpentine, and cutting of mature timber only, a profitable and permanent industry could be developed.

The most common native pasture grass on Leon fine sand is wiregrass. Less important grazing plants are wild oats, broadleaf grasses, and sedges. Other suitable pasture plants are discussed in the section on Land Use, Soil Management, and Estimated Yields. If this soil is to be used for cultivated crops, the organic-matter content should be increased, lime and fertilizer applied, and water control practiced.

MADE LAND

Made land (Ma) occurs in the western and northwestern parts of the county in areas ranging from 1 to 40 acres. It consists of calcareous and phosphatic residues from washings of mined phosphate. The material, silty to clayey in texture with a small quantity of fine sand, has accumulated in depressions and on flats. Drainage is im-

perfect to good. Some of this land is used for corn, peanuts, and cucumbers, and good yields are usually obtained.

MINES, PITS, AND DUMPS

Mines, pits, and dumps (Mb) consist of numerous areas near Newberry where limestone and rock phosphate were quarried. The pits range from 50 to 1,000 feet long and 25 to 300 feet wide and are several feet deep. The dumps cover from a fraction of an acre to 10 acres or more and represent surface strippings of light yellowish-brown or gray fine sand, which may have been 5 to 15 feet thick over the phosphate rock and limestone. This land type is droughty and unproductive and in many places is almost barren. Scant growths of grasses, weeds, and scrub pines constitute the vegetation.

ORLANDO SERIES

The Orlando soil has formed from thick beds of acid sand and loamy sand or sandy clay. It is associated with Lakeland, Blanton, Fort Meade, and Scranton soils. It differs from Lakeland and Blanton soils in being dark gray, from the Fort Meade in its low content of phosphorus, and from the Scranton in its much better drainage. It is strongly to very strongly acid throughout the profile. Orlando fine sand is the only unit mapped in the county.

Orlando fine sand (Oa).—This strongly acid soil occurs in rather large areas near Hawthorn, Lochloosa, Phifer, and Fairbanks, and in smaller areas in other parts of the county. Its surface is almost level, smooth to undulating, or gently sloping. Drainage is moderately good.

Profile in a cultivated field:

0 to 8 inches, very dark-gray to dark grayish-brown loose fine sand containing considerable quantity of organic matter, which is well united with the fine sand particles.
8 to 20 inches, medium-gray loose fine sand.
20 to 46 inches, light-gray or yellowish-gray loose fine sand continuing to depths of 5 to 7 feet or more; underlain by a mottled light-gray and yellow friable sandy clay.

In the southeastern part of the county, the texture is somewhat coarser and varies from a fine to a medium sand. Where this soil borders areas of Lakeland and Blanton soils, it becomes lighter in color and in a few places includes small areas of the adjacent soils.

Use and management.—About 40 percent of Orlando fine sand is cultivated. The rest is forested, mainly with loblolly and longleaf pines and a scattering growth of hardwoods. The crops grown and the fertilization and management practiced are comparable to those for the Lakeland fine sand phases, but the yields are generally higher. This may be because of the higher content of organic matter and better moisture-holding capacity. The soil is very easy to till and responds readily to fertilization and good management practices.

PEAT

Peat (Pa) occurs mainly in the marshes of Orange Lake, but smaller areas are found near Gainesville. The vegetation consists of pickerelweed, waterlily, water-hyacinth, sawgrass, and other aquatic plants. The soil is covered with water or saturated the greater part of the year.

A soil profile in a cultivated field near Island Grove consists of an 8-inch surface layer of dark-brown fairly well decomposed peat, which overlies dark-brown fibrous to very fibrous peat, grading at about 15 inches below the surface to brown or dark-brown fibrous peat. This, at about 40 to 50 inches, rests upon a brownish-gray or gray sandy clay. Peat is very strongly to extremely acid throughout its entire depth, but the fine sandy clay underlying it is mildly acid to nearly neutral in many places. Being almost entirely organic in composition, Peat is deficient in both phosphorus and potash.

Included with Peat are timbered areas, shown on the soil map by symbol, that occur in swamps and are derived from the decay of tree leaves and woody material. This timbered Peat is saturated or covered with water most of the time. It consists of dark-brown fibrous woody peat that extends to depths of 40 to 60 inches, and is underlain by brownish-gray fine sandy clay. It is very strongly acid throughout. Large areas are in the southeastern part of the county.

Use and management.—About 10 percent of Peat has been drained for farming, but at present only a comparatively small acreage is being cropped. Celery, the only crop produced, is fertilized with 2 tons of a 5–5–8 or 5–5–10 mixture an acre. Yields are 475 to 600 crates an acre.

None of the timbered Peat is cultivated, and under present conditions its best use is forest. It provides some forest products and some grazing for cattle and hogs in the driest seasons. Cypress, blackgum, sweetgum, and redbay are the principal trees.

PEATY MUCK

Peaty muck (Pʀ) is well distributed in small to medium-sized areas throughout the county except in the western third. All areas occur in depressions, along streams, in bays, or bordering lakes. Peaty muck differs mainly from timbered Peat in being less fibrous throughout and containing considerable mineral matter, mostly fine sand.

This very strongly acid soil consists of dark-brown to brown well decomposed organic matter, which in places is more or less sandy. This material rests at depths of 1 to 12 feet, but averaging about 4 feet, upon gray fine sand, or in some places, on gray fine sandy loam or gray fine sandy clay.

Use and management.—Peaty muck is not cultivated. It is covered largely with bay, slash pine, cypress, gum, and magnolia. Drainage would be both expensive and difficult, but if drained, reclaimed, and heavily fertilized, good yields of truck crops could be obtained.

PLUMMER SERIES

The Plummer soil occupies level areas or depressions and is poorly drained. It has formed from thick beds of acid sand overlying sandy loam or sandy clay. It is associated with Rutlege, Scranton, and Leon soils, but it lacks the organic hardpan layer of the Leon soil and differs from the Rutlege and Scranton in having a much lighter colored soil. It is more poorly drained than the Scranton soil. Plummer fine sand is the only unit mapped.

Plummer fine sand (Pc).—Water stands on the surface of this soil during the rainy season, and the water table is continuously high. Both surface and internal drainage are poor. The soil occurs principally on level areas and in depressions in the level pineland section

of the eastern part of the county. It differs from Rutlege fine sand in having less organic matter in the surface soil and in being less loamy throughout.

In the virgin state the upper 3 inches of the surface soil is a gray fine sand. Underlying this material and extending to depths of 5 feet or more is a dingy-gray to light-gray loose usually wet fine sand.

Use and management.—Practically none of Plummer fine sand is cultivated. The dominant tree growth is cypress and gum, but in some areas slash pine and an undergrowth of wiregrass prevail. The areas outside of the cypress ponds offer the best possibility for drainage. In southern Georgia some good pastures have been obtained on Plummer soils by clearing, slightly draining, and sowing a mixture of carpetgrass, Dallisgrass, common lespedeza, and white clover. The soil should be limed and fertilized, as it is of low productivity.

REX SERIES

The Rex series consists of soils derived from thick beds of acid loamy sand overlying sandy clay. Rex soils differ from the associated Leon soil in lacking the organic hardpan layer and in overlying finer materials at much shallower depths. They are darker, shallower to heavy sediments, and less well drained than the associated Blanton and Lakeland soils. Relief is nearly level to undulating. Rex loamy fine sand and its shallow phase are mapped.

Rex loamy fine sand (Ra).—This soil is closely associated with Blanton and Leon soils. It occurs on gently sloping and undulating areas in the eastern part of the county between Waldo and Hawthorn. The surface drainage is fair to good, but internal drainage is imperfect to poor, as is indicated by the mottled subsoil. Since the soil readily absorbs rainfall and retains moisture well, it withstands drought better than soils with either very pervious or plastic subsoil.

Profile 3 miles southeast of Waldo:

0 to 6 inches, gray or dark-gray nearly loose loamy fine sand; some of the small quantity of organic matter is fairly stable but most of its disappears in a few years under cultivation.
6 to 12 inches, light-gray or pale-yellow nearly loose loamy fine sand.
12 to 35 inches, pale-yellow to yellowish-gray nearly loose loamy fine sand containing some yellowish-brown and gray mottling in the lower part.
35 to 71 inches, light yellowish-brown or yellowish-gray, mottled with brown, friable fine sandy loam.
71 inches +, slightly compact heavy but friable fine sandy loam or fine sandy clay mottled with yellowish brown and gray.

Small areas of the adjoining Leon fine sand or Blanton fine sand, shallow phase, were included in mapping. Locally a brown stained layer a few inches thick is at 6 to 10 inches below the surface. In a few places, particularly near Island Grove, where the texture of the surface soil is sand, there is a smaller quantity of fine mineral material throughout the soil profile.

Use and management.—About 20 to 25 percent of Rex loamy fine sand is cultivated, and the rest is grazing land that is largely covered with wiregrass and longleaf pine. Of the cultivated soil, 35 percent is in corn planted with peanuts and velvetbeans, 20 percent in truck crops, 10 percent in pecans, 1 percent in citrus fruit, and small acreages in tobacco, sweetpotatoes, and sugarcane. The loamy surface soil with its fair quantity of organic matter and good moisture supply naturally favors permanent pasture.

This soil responds well to fertilization. In growing tobacco, 800 to 1,000 pounds of 3–8–5, 3–8–8, or 4–8–6 fertilizer mixture are used, and for the average truck crop 800 to 1,200 pounds of 4–7–5 mixture are customarily used. The acre yields of intertilled corn, peanuts, and velvetbeans is 12 to 15 bushels of corn and 20 to 25 bushels of peanuts. The average acre yield for string beans is 90 crates; lima beans, 80 crates; cucumbers, 150 crates; and tobacco, 800 pounds. Peanuts receive 100 to 300 pounds of gypsum at blooming. All the citrus growers and most of the pecan growers use fertilizer. An average yield of fruit in a 20-year-old citrus grove is 2 or 3 boxes a tree.

One of the most important aims in the management of this soil is to increase and maintain the actively decomposing organic matter. This soil constituent can be supplied by growing and plowing under crotalaria or other cover crops.

Rex loamy fine sand, shallow phase (Rb).—This phase is closely associated with Rex loamy fine sand and Leon fine sand. It resembles Rex loamy fine sand in the character of the surface soil and subsurface layer but differs in that it is underlain at 12 to 30 inches below the surface by a mottled pale-yellow and yellowish-brown, with some red and gray, friable fine sandy loam or fine sandy clay. Relief is undulating or gently sloping and in some areas nearly level. Surface drainage is fair to good, but internal drainage is imperfect, as is reflected in the mottled subsoil.

Use and management.—About 40 percent of Rex loamy fine sand, shallow phase, is cultivated, and the rest is forested with loblolly and longleaf pines and some hardwoods and used for range pasture. The crops grown and the management practiced are about the same as those given for Rex loamy fine sand, but the yields are slightly higher. A slightly higher productivity can probably be built up and maintained in this soil because of the fine sandy loam or fine sandy clay subsoil near the surface.

RUTLEGE SERIES

Soils of the Rutlege series have formed from moderately thick beds of acid sand and loamy sand in the Coastal Plain. They are associated with Plummer, Bayboro, and Scranton soils. They differ from the Plummer in having a black, rather than gray, surface; from the Bayboro in not having as heavy sediments so near the surface; and from the Scranton in being much less well drained. They occur in depressions or on level areas and are covered with water or are waterlogged most of the time. Rutlege loamy fine sand, shallow phase, and Rutlege fine sand are mapped.

Rutlege loamy fine sand, shallow phase (Rd).—This nearly level soil occurs principally in the eastern part of the county in close association with the Leon and Rex soils. Where the soil occurs in depressions, there is a very gradual slope toward the interior of the depression. Both external and internal drainage are very poor, as water stands on the surface for considerable periods.

The 8- to 12-inch surface soil is black to very dark-gray nearly loose loamy fine sand. It has a high content of organic matter, which gives it a loamy feel, and is very strongly acid. It is underlain by strongly acid yellowish-gray or light-gray loose loamy fine sand, which con-

tinues to depths of 24 to 40 inches. This is underlain by light-gray friable fine sandy loam with some yellow or brown mottles.

Those areas where fine sandy loam or fine sandy clay is within 30 inches of the surface belong in the Portsmouth series, but were not mapped under that name because they could not practically be separated from the Rutlege soils on a map of the scale used.

Use and management.—A very small percentage of Rutlege loamy fine sand, shallow phase, is cleared and cultivated. The uncleared areas support a growth of cypress, bay, gum, red maple, and a few slash pine. The yields in the drained areas under similar practices are comparable with those on Scranton loamy sand-fine sand. If cleared, drained, limed, and fertilized, the soil would produce good yields of corn, potatoes, and leafy vegetables. It would also make excellent pasture if seeded and treated with lime and fertilizer.

Rutlege fine sand (Rc).—This soil is well distributed in small- to fair-sized tracts over the eastern half of the county. It occurs in basinlike situations or in slight depressions in areas of Leon, Lakeland, and Blanton soils and to less extent in some of the Gainesville, Arredondo, and Fellowship soils. It is very poorly drained; either water stands on the surface a large part of the time or the soil is somewhat waterlogged. Artificial drainage is necessary to reclaim this soil for agricultural purposes.

The 8- to 14-inch surface soil is black to dark brownish-gray nearly loose fine sand. It has a high organic-matter content and in some places the surface is mucky. It is underlain by light-gray fine sand mottled with yellow or brown. This layer continues downward to depths of 36 to 60 inches or more and is usually water-soaked. It is underlain at varying depths by light-gray friable sandy clay loam. All layers are very strongly acid.

In the southwestern and south-central parts of the county are some prairie areas, shown on the map by symbol. These areas are covered with maidencane, giant carpetgrass, waterlilies, water-hyacinths, and other aquatic plants.

Use and management.—Rutlege fine sand supports a growth of cypress, bay, gum, red maple, and a few slash pine. The few small areas that have been drained and cultivated are fertilized and managed in about the same manner as Scranton loamy fine sand-fine sand. If drained, cleared, and treated with lime and fertilizer, this soil would produce good pasture grasses. All trees need not be cut, but the underbrush should be cleared to permit the sunshine to reach the soil surface in order to produce good pasture.

The prairie areas are not cultivated, but they are used as range for cattle. The carrying capacity of native pastures is comparable with that of the prairie variations of Bayboro and Bladen soils.

ST. LUCIE SERIES

The St. Lucie soil has formed from thick deposits of unconsolidated sand. It occurs in association with Lakeland, Blanton, and Leon soils on level and low ridgy or hummocky surfaces. Drainage is excessive. The tree growth consists largely of dwarf live oak, sand pine, and saw-palmetto.

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St. Lucie fine sand (SB).—Small areas of this soil occur in association with the Lakeland fine sand phases in the northwestern part of the county and with Leon fine sand in the southeastern part. The surface is undulating, but low ridges and slight knolls are common. The tree growth consists of dwarf live oak and sand pine and an undergrowth of saw-palmetto, rosemary, runner oak, and very little grass. All areas are readily recognized by their vegetation.

A typical virgin profile consists of about 2 inches of light-gray very loose fine sand underlain by very loose white fine sand, which extends to depths of 5 feet or more. In the northwestern part of the county a few areas of Lakewood fine sand (not mapped in this county) are included. This included soil has a yellow to orangish-yellow color below depths of 10 to 20 inches.

Use and management.—St. Lucie fine sand is not used for crop production and has little value for forestry and grazing. It is too droughty and inherently poor for farming.

SCRANTON SERIES

The Scranton soils are associated with Blanton, Leon, Orlando, and Rutlege soils. The Scranton are better drained and are more yellow and brown in the subsoil than the Rutlege soils. They are not so well drained as the Orlando, which also has a gray subsoil. They have developed from thick deposits of unconsolidated sand and sandy clay and are strongly acid throughout the profile. Drainage is imperfect to poor, being somewhat restricted by the mild relief and by the presence of heavy layers at shallow depths.

Scranton loamy fine sand-fine sand (SA).—This complex consists of intricately mixed areas of Scranton loamy fine sand and Scranton fine sand that could not be separated on the map used. Areas occur principally in the west-central and northern parts and to a less extent in the central, eastern, and southeastern parts of the county. The surface is level to nearly level. Natural drainage is imperfect to poor, and most areas require artificial drainage for agricultural use. Drainage can usually be accomplished by open ditches at a comparatively small expense under normal conditions. High bedding of the imperfectly drained soils is a common practice (pl. 7, *A*). Natural vegetation consists of several species of pine and a few oaks and an undergrowth of wiregrass and gallberry.

Profile in a wooded area of Scranton loamy fine sand-fine sand:

0 to 8 inches, black or dark-gray loamy fine sand having a high organic-matter content.
8 to 13 inches, brownish-gray or dark-gray loamy fine sand containing a fair quantity of organic matter.
13 to 48 inches, light-brown or yellow loamy fine sand somewhat mottled with light gray and brown.

In the southeastern part of the county the texture is slightly coarser and approaches a medium sand. The depth of the surface soil and the color of the subsoil vary considerably in the complex. In some places the subsoil is almost uniformly yellow or light brown and grades toward Orlando soil; in others, it is grayish yellow or mottled yellow, brown, and gray and grades toward Blanton, Leon, and Rutlege soils. In the more poorly drained areas this complex is closely associated

A, Method of bedding on Scranton loamy fine sand-fine sand; field is planted to Irish potatoes.
B, String beans growing on Scranton loamy fine sand-fine sand.

A, High hammock vegetation on Gainesville and Arredondo soils.
B, Low hammock vegetation on Bladen and Kanapaha soils.

with Leon and Rutlege fine sands, whereas in some of the better drained areas it is associated with Arredondo loamy fine sand-fine sand and Blanton fine sand.

Use and management.—About 40 or 50 percent of Scranton loamy fine sand-fine sand is cultivated. In the wooded areas, loblolly and slash pines predominate (pl. 6, *B*), although there are some hardwoods. The forested areas also have an undergrowth of various coarse grasses that furnish open range pasture for cattle and hogs. This is perhaps the best land in the county for sugarcane, cabbage, lima beans, string beans (pl. 7, *B*), green corn, cucumbers, eggplant, English peas, peppers, Irish potatoes, okra, squash, and corn. It has a high content of organic matter and favorable moisture conditions. All the truck crops are heavily fertilized.

Corn yields 20 to 35 bushels an acre; Irish potatoes, 150 bushels; lima beans, 110 crates; string beans, 125 crates; cabbage, 9 tons; cucumbers, 175 crates; peppers, 200 crates; English peas, 60 crates; and sugarcane, 250 to 275 gallons of sirup.

SWAMP

Swamp (Sc) consists of low-lying areas covered with water most of the year or saturated throughout the year. The soils in these areas are mainly alluvial materials that vary in texture, color, composition, and thickness of layers within short distances. It would be impracticable to separate the materials into soil types or phases, but some of the soils are recognized as Rutlege fine sand, Plummer fine sand, Leon fine sand, Peaty muck, and Peat.

Use and management.—At present Swamp is not used for agriculture. Its chief value is for forestry. The characteristic tree growth consists of cypress, bay, gum, ash, water and swamp chestnut oaks, and an occasional slash or loblolly pine. There is a thick undergrowth of vines, briers, and water-loving plants. Hogs and cattle range over this land in low-water periods.

WATER AND GRASS

The areas mapped as Water and grass (Wa) are characterized by shallow ponds, slight depressions, or parts of lake beds. Most of the year these areas are covered with water from a few inches to 3 feet or more; in fact, some of them are intermittent lakes. They support a thick growth of coarse water-loving grasses, sedges, and lilies. A variety of soils occurs in these ponds, but owing to the permanently saturated condition and variability, classification into series and types was not warranted.

The surface soils range from light gray to black and are underlain by light-gray or almost white fine sand or by peaty or mucky material. They comprise areas of Plummer, Rutlege, and Bladen soils, and Peat.

Use and management.—Water and grass areas furnish grazing for cattle during dry periods when the water is low. Drainage in most places would be expensive and difficult; moreover it would lower the water table of the region and thus cause considerable damage to some of the soils now cultivated or used for pasture grasses.

LAND USE, SOIL MANAGEMENT, AND ESTIMATED YIELDS

LAND USE

More than half the land in Alachua County is in farms, but less than half of the farm land is cropped. Of the 344,411 acres that were in farms in 1945, 94,769 acres were used for crops, 37,295 were idle or fallow, 36,044 were in plowable pasture, 20,830 were in other types of pasture, 143,769 were in woodland and woodland pasture, and 11,704 were utilized for other purposes. The land not in farms is used mainly for grazing and forestry.

Land use is closely related to the natural soil groups of the county. The broad uses of the various soils as well as their suitability for different cultivated crops have been pointed out under the individual soil descriptions in the section Soils of Alachua County.

GENERAL GROUPING OF THE SOILS

The soils are classified in 12 groups according to use suitability and management practices. For example, the production of watermelons is confined to the well-drained soils of the undulating pineland. Truck crops, other than watermelons, are produced mainly on the Fellowship, Rex, Scranton, and Bladen soils, but some are grown on the heavier well-drained soils of the high hammocks. Tung and pecans are grown on both well and imperfectly drained soils. Experiences with tung indicate that this crop should be planted only on well-drained soil or on better drained areas of the imperfectly drained soils and that areas must have good air drainage. Citrus crops are confined to areas near large lakes, which provide some protection against cold damage. Except for small artificially drained areas of the Bladen soil and Peat, practically none of the poorly and very poorly drained soils are cropped. The soils of the scrub ridges are too dry for crops.

GROUP 1

Group 1 consists of well-drained soils of the undulating to sloping high hammock land. These soils, the best general farming land in the county, are the undulating and rolling phases of Gainesville loamy fine sand, Gainesville-Arredondo loamy fine sands, Arredondo-Fellowship loamy fine sands, Arredondo loamy fine sand-fine sand, Fort Meade loamy fine sand, and Alachua loamy fine sand. They contain more phosphate and lime than soils of any other soil group in the county.

The principal crops are corn, peanuts, sugarcane, and sweetpotatoes, although some sea-island cotton and truck crops are grown. Pecan and tung trees do well. Management practices include the use of fertilizer for most of the crops. The rolling to steeply sloping areas require some protection against sheet erosion.

GROUP 2

The well-drained soils of the low flat hammocks comprise group 2. These soils, Kanapaha fine sand and Kanapaha-Bladen complex, are largely forested. Few areas have been used for general field crops

and citrus. The yields of field crops are low, but when heavily fertilized, citrus does fairly well if protected from frost.

GROUP 3

Group 3 contains well-drained soils of the undulating pineland underlain by sandy clay material. These soils—Lakeland fine sand, undulating phase; Blanton fine sand and its shallow phase; Orlando fine sand; and Jamison loamy fine sand—are not so productive and are more acid than those in group 1.

The principal crops are corn, peanuts, tobacco, watermelons, sugarcane, and truck crops. Fairly large areas are used for tung and pecan trees. Like the soils in group 1, the moisture conditions are favorable and tillage is easy. Management practices are practically the same.

GROUP 4

The well-drained soils of the undulating to sloping pineland underlain by limestone comprise group 4. This group includes Hernando-Jonesville fine sands, Jonesville-Hernando fine sands, Archer-Jonesville fine sands, and Chiefland fine sand.

These soils are considered the best in the county for bright tobacco and peanuts, and they are also well suited to watermelons, sugarcane, and truck crops. Through the incorporation of organic matter, these soils, particularly those with sandy loam within 12 to 30 inches of the surface, can be built up to a fair state of productivity and easily maintained.

GROUP 5

The soils in group 5 are the imperfectly drained soils of the undulating pineland. Rex loamy fine sand and its shallow phase are in this group.

Under good management practices they are well suited to truck crops. Lima beans do especially well, and some citrus and pecans are grown. Because of slow internal drainage they are not so well drained as the soils of group 3, even though they occur on gently sloping relief.

GROUP 6

Scranton loamy fine sand-fine sand, the only soil in group 6, is an imperfectly to poorly drained soil of the level pineland. It requires some drainage to reclaim it for cultivation, although moisture conditions are favorable.

It is considered the best soil in the county for potatoes, string beans, cabbages, eggplant, and green peppers. Heavy applications of high-grade fertilizer are used for the truck crops. Corn usually is planted in rows between the potatoes before the potatoes are harvested.

GROUP 7

The soils in group 7 are the undulating and rolling phases of Fellowship loamy fine sand and the undulating phase of Fellowship gravelly loamy fine sand. These are imperfectly drained soils of the sloping high hammock land; their imperfect drainage results from the heavy subsoil. The more sloping areas under cultivation are subject to erosion.

These soils are good truck-crop land. They are used mainly for corn, although some peanuts, sugarcane, truck crops, and pasture grasses are grown.

GROUP 8

Bladen loamy sand is the only soil in group 8. It is a poorly drained soil of the low flat hammock land and prairies.

Where artificially drained, this soil is considered good for Irish potatoes. Other vegetables and corn do well, and some citrus is grown where there is less danger of frost. The prairie areas, mainly in Payne Prairie, afford excellent pastures, but it is difficult to drain them.

GROUP 9

The soils of group 9, Leon fine sand and Plummer fine sand, are little used for cultivated crops because they require both drainage and irrigation. They are inherently low in mineral plant nutrients and are very strongly to extremely acid. The main use is for timber and range pasture.

GROUP 10

The soils of group 10 are very poorly drained soils of swamp areas. Rutlege loamy fine sand, shallow phase; Rutlege fine sand; Bayboro loamy fine sand; Peat; and Peaty muck are in this group.

Peat is used to a small extent for celery, but heavy applications of fertilizer are required. With proper treatment it would probably make good pasture grasses. Prairie areas of Bayboro soil are used for pasture.

GROUP 11

The deep loose sands of group 11 are Lakeland fine sand, deep phase, and St. Lucie fine sand. They are excessively drained soils of the sloping blackjack ridges. They are very droughty and are not used for farm crops. They support a scrub growth of blackjack and turkey oaks and afford only very scant range pasture.

GROUP 12

Group 12 consists of Alluvial soils, undifferentiated; Made land; Mines, pits, and dumps; Swamp; and Water and grass. These lands are used for forestry and open range pasture, but Made land is used to some extent for corn and peanuts.

SOIL MANAGEMENT

TILLAGE PRACTICES

Tillage practices depend on the nature of the crop and on soil conditions. Preparation for planting most field and truck crops consists of breaking the ground 3 to 6 weeks before planting and then bedding the soil on level areas. Moldboard plows are operated at depths of 4 to 8 inches, depending on the depth of the surface soil and the quantity of plant material to be turned under. Cultivation is usually done with small moldboard plows, middle busters, and sweeps, drawn by mules, but some farmers use tractor-drawn cultivators. Cultivation at intervals of 1 to 2 weeks is continued until the crops are mature or until the danger of serious competition of weeds for moisture and nutrients is eliminated.

A wide variety of tillage practices is used in tung, citrus, and pecan groves. In young groves, some farmers plant vegetables or field crops that are cultivated in the usual manner. In old groves and in young groves where other crops are not grown, some growers practice clean cultivation whereas others harrow only once a year, usually late in

fall. The most common practice, perhaps the best, consists of two harrowings, one in spring following fertilization and one in fall after the summer cover crops have produced seed.

On the more sloping areas of the Gainesville, Arredondo, Fellowship, Hernando, and Archer soils, all tillage operations should be on level areas insofar as possible, as a means of protecting the soil against erosion.

FERTILIZATION

According to the Florida Department of Agriculture, 8,679 tons of commercial fertilizer were used in Alachua County in 1939. Of this, 2,457 tons were fertilizer material and 6,222 tons were mixed fertilizer. The compounds most commonly used as individual materials were nitrate of soda, sulfate of ammonia, nitrate of potash, muriate of potash, kainite, superphosphate, and raw phosphates. The most popular mixtures were 4–7–5, 3–8–5, and 4–8–6, which together made up 82 percent of the mixed fertilizers used. In most mixtures, one-third to one-half of the nitrogen is from organic sources.

Most of the fertilizers are used in the production of vegetables, tobacco, citrus, and tung. The most common fertilization program for vegetables consists of an application of a mixer fertilizer in the row 1 or 2 weeks before planting, and, in the case of most crops, a side dressing of nitrate of soda, sulfate of ammonia, or nitrate of potash just prior to the rapid-growth stage. In some cases, about half the mixed fertilizer is applied before the crops are planted, and the rest as a side dressing when the crops are about half grown or just prior to the bloom stage. In others, the nitrogen side dressing is split into two or three applications. For most vegetables a 4–7–5 or 4–8–6 mixture is used, but for sweetpotatoes 3–8–8 or 4–8–10 is used, and for celery grown on Peat 5–5–10 or 3–6–10 is used.

Fertilizers used for various vegetables, in pounds an acre, are given in table 6.

TABLE 6.—*Fertilizers used for various vegetables, in pounds per acre*

Vegetables	Mixed fertilizer [1]	Nitrogen side dressing
	Pounds	*Pounds*
Beans:		
Lima	800–1, 200	16–32
String	600–1, 000	0
Cantaloups	600–800	16
Celery	4, 000–5, 000	0
Corn, green field	200–400	16–24
Cucumbers	1, 000–1, 200	32–48
Eggplant	1, 200–1, 600	32–64
Lettuce	1, 600–2, 000	24–48
Okra	400–600	0
Peas, English	1, 000–1, 400	16–32
Peppers	1, 200–1, 600	32–64
Potatoes, Irish	1, 800–2, 000	0
Squash	1, 000–1, 200	16–32
Sweetpotatoes	600–1, 000	0
Tomatoes	1, 000–1, 200	16–32
Watermelons	600–800	16

[1] 4–7–5 for most crops except celery, for which 5–5–10 is used.

The fertilizer requirements for citrus and tung trees are determined by a number of factors; the most important are the kind of soil and the age, size, and general condition of the trees. A common practice in citrus groves on the Bladen soil consists of fertilizing three times each year (March, June, and September) with a 4–8–6 or 4–8–8 fertilizer at the rate of ½ to ¾ pound a tree for each foot of spread. Some growers supplement the spring application with nitrate of soda and substitute sulfate of ammonia for the fall application of mixed fertilizer.

For tung trees, 5–8–4, 5–7–5, or similar mixture is applied at the following annual rates a tree, according to age: A 1-year-old tree, ½ to 1 pound; 2, 3, and 4 years, 1 to 2 pounds; 5 and 6 years, 2 to 4 pounds; 7 and 8 years, 4 to 8 pounds; and 9 years or more, 10 to 12 pounds. The fertilizer is applied in two applications, one in March and one in June. In areas where bronzing is likely to occur, zinc sulfate (*11*) is applied at the rate of 1 to 2 ounces a tree annually in groves under 4 years old and about 4 ounces a tree every other year in older groves. Older trees showing serious zinc deficiency may receive as much as half a pound of zinc sulfate a tree annually.

Most of the commercial pecan groves are fertilized. Some of the more successful growers broadcast 4–8–6 or 4–8–8 fertilizer in their groves in March or April at the rate of 2 pounds a tree for each year of age. Others use only half this quantity. Where vegetables are grown in the groves, the trees receive some benefit from the fertilizer used. For a practical fertilizer program for pecans the experiment station recommends a leguminous winter cover crop, such as vetch, Austrian winter peas, and lupines, fertilized with about 300 pounds of superphosphate and 75 to 150 pounds of muriate or sulfate of potash, followed by a summer cover crop of crotalaria and an application of zinc sulfate (*3*), (*4*).

For neglected groves, where trees are in very poor condition, additional nitrogen should be supplied during the first 2 or 3 years of the cover-crop program. Zinc sulfate should be applied annually at the rate of 1 to 2 pounds a tree. The zinc may be added to the soil or applied as a spray. In an experiment conducted on Rex loamy fine sand, yields on plots that received fertilizers and zinc were about 20 percent higher than on those that received fertilizers alone.

Field crops, other than tobacco, cotton, and sugarcane, are fertilized only lightly or not at all. Tobacco is fertilized with 800 to 1,200 pounds of 3–8–5, 3–8–8, or 4–8–6 an acre; cotton, with 300 to 500 pounds of 3–8–8 or 4–8–6; and sugarcane, with stable manure, cottonseed meal, or a 4–7–5 mixture. In some instances, sugarcane is grown on "cowpen" land, without additional fertilization. Corn, peanuts, and velvetbeans, when grown together, are not fertilized. Some farmers use 200 to 400 pounds of land plaster (gypsum) on peanuts grown alone. Some use 200 to 300 pounds of a complete fertilizer in the row, and a side dressing of 100 to 150 pounds of nitrate of soda or its equivalent on corn grown alone. A few farmers use zinc sulfate under corn to prevent whitebud. In tests at the Experiment Station (*1*) on Lakeland fine sand soils, zinc sulfate applied at the rate of 12 pounds to the acre increased corn yields as much as 75 percent. Less spectacular increases were obtained with velvetbeans, cowpeas, pearl millet, crotalaria, and oats.

Although the kind and quantity of fertilizers added to the soil depend primarily on the crop, they also vary with different soils. Dark soils, such as the Scranton, Fort Meade, Alachua, and Peat, require less nitrogen than do light-colored ones, such as the Hernando, Archer, Chiefland, Lakeland, and Blanton series. The dark and heavier soils are better able to absorb potassium and thereby retard its loss by leaching. The phosphorus requirement of the soils of the high hammocks and of the Hernando-Chiefland soil group is not so great as that of several others in the county. Zinc deficiencies, evidenced in tung by bronzing, in pecans by rosetting, and in corn as whitebud, seem to be most acute on the soils of the high hammocks, less severe on the Hernando-Archer group, and even less on the Lakeland-Blanton group and the Scranton, Rex, and Bladen series.

ROTATIONS AND GREEN-MANURE CROPS

Crop-rotation practices, including use of green-manure crops, are varied. In citrus, tung, and pecan groves, crotalaria and native weeds are grown in summer and turned under in fall, and the ground is left somewhat bare in winter. Some farmers plant vegetables and field crops in young groves. In potato fields, corn is planted in alternate middles and cultivated in the usual manner after the potatoes are harvested. Vegetables frequently are succeeded by a volunteer growth of weeds or crotalaria, which is turned under about a month before the next crop is planted. Where two or more vegetables are grown, they are rotated. Watermelons are generally planted on new land or else on old land only once in 5 to 7 years to reduce damage from wilt, but wilt-resistant varieties developed by the Experiment Station (*20*) are now being used in many instances.

On general farms the common practice is to produce an intertilled crop of corn, peanuts, and velvetbeans. Some or all of the corn is harvested, the peanuts and remaining corn are hogged off, and the velvetbeans are grazed by cattle. The land may be used in this manner year after year, but some form of crop rotation or resting of the land is practiced by most farmers. If it is the policy to rest the land, a field may be used for crops 1 year and rested the next or used for crops 2 or 3 years in succession and rested for 1 year. The rested land that supports a growth of native weeds and grasses and perhaps some crotalaria and beggarweed is used as summer pasture. Peanuts for market, cotton, watermelons, tobacco, oats, rye, and hay crops are planted on land that has been rested, or in rotation with interplanted corn, peanuts, and velvetbeans.

Studies by the Experiment Station on green-manure cover crops and rotations have yielded some interesting data. In tests of cover crops on the Lakeland fine sand phases in citrus groves (*15*) *Crotalaria striata* gave an average yield of 4,969 pounds of air-dried top growth an acre; velvetbeans, 1,960 pounds; beggarweed, 2,453 pounds; cowpeas, 2,061 pounds; and natalgrass, 3,403 pounds. From crops having average yields the pounds of nitrogen returned to the soil an acre were: Crotalaria tops, 108 pounds; velvetbeans, 39; beggarweed, 29; cowpeas, 34; and natalgrass, 36. In a test of various cover crops in a 2-year rotation with corn (*14*), the yield of corn following *Crotalaria striata* was 16.6 bushels; velvetbeans, 16.8 bushels; beggarweed, 12.0 bushels; cowpeas, 14.2 bushels; and Florida pussley, a native weed,

8.7 bushels. Continuous use of green-manure crops on light sandy soils is necessary for maintenance of productivity.

In another experiment (*16*) interplanted corn and runner peanuts, without fertilizer or zinc, have yielded an average of 6.3 bushels of corn and 523 pounds of peanuts an acre when grown on the same plots every year, but 11.55 bushels of corn and 894 pounds of peanuts when the land is allowed to grow up in crotalaria and native weeds every other year.

Crop rotations and green-manure crops are therefore valuable for maintaining or increasing soil productivity. The use of green-manure crops, particularly on the light sandy soils of high pineland as a means of reducing losses of nutrients by percolation, and on the more sloping areas of the heavier soils of the high hammocks as a means of protecting the soil against erosion, is recommended for serious consideration. *Crotalaria spectabilis*, *C. intermedia*, and *C. striata* are valuable summer cover and green-manure crops for general use throughout the county. Of the winter cover and green-manure crops, blue lupine is well suited to the heavier soils of the high hammocks, whereas oats and rye may be used on any of the agricultural soils.

PASTURES AND THEIR MANAGEMENT

Farmers in the county depend almost entirely on their pastures for livestock food. The bulk of the pasture for beef cattle and a good part of that for hogs is found on the range. The range lands vary considerably as to the kind, quantity, and quality of forage produced. On the hammock lands the forage includes broadleaf grasses, sedges, Spanish moss, acorns, and buds and tender shoots of various shrubs and trees; on the undulating pineland and the scrub ridges it consists mainly of wiregrass but includes a few other grasses, sedges, legumes, and acorns; on the level pineland, pasture is mainly wiregrass but includes carpetgrass and other broadleaf grasses; and on the prairies it includes maidencane, carpetgrass, giant carpetgrass, jointgrass, hyacinths, and various aquatic plants.

The estimated average carrying capacities (*12*) of the different types of range land are: Prairie, one cow on 1 acre; hammock land, one cow on 5 acres; level pineland, one cow on 10 acres; and undulating pineland and scrub ridges, one cow on 22 acres. The carrying capacity of the better types of undulating pineland is one cow on about 15 acres, whereas on the poorer scrub ridges it is one cow on about 30 acres.

The prairies furnish good grazing from late spring until early fall, whereas the hammock lands furnish fairly good grazing most of the year. These lands are seldom burned, as burning tends to lower the quality of forage and to destroy broadleaf grasses and legumes. Neither is burning desirable on ranges where highest returns from forest products are desired.

On ranges where wiregrass is dominant, on the other hand, controlled rotational burning should be practiced (*7*). The level pineland, the undulating pineland, and the scrub ridges are burned annually or every 2 or 3 years to improve the quality of the wiregrass. Following burning, which is usually done in February, wiregrass puts on new growth and is very palatable and highly nutritious for about 90 days. In a comparison of burned and unburned flat-woods range,

steers grazed on the areas burned annually gained approximately twice as much as those grazed on the unburned areas (*17*).

Cattle grazing entirely on the palmetto flat woods or scrub ridges are affected by the nutritional disease, salt sick. Cattle must then be moved to other types of range. This disease can be prevented by keeping a mixture of 100 pounds of common salt, 25 pounds of red oxide of iron, 1 pound of pulverized copper sulfate, and 1 ounce of cobalt chloride or cobalt sulfate before the cattle at all times (*2*). Usually the cobalt is dissolved in a small quantity of water, sprayed on the other materials, and the whole thoroughly mixed.

Considerable attention has been given to range improvement, particularly on the prairies and level pinelands. Thistles and dogfennel, which are common weed pests on the prairies, may be exterminated by close mowing in the full-bloom stage or by otherwise preventing seeding (*5*). Carpetgrass may be readily established on flat pineland when seeded following burning in May, June, or July.

Although farmers keep most of the beef cattle on the range throughout the year, a few cattlemen and most of the farmers with small herds transfer their animals to temporary pastures in winter. Crops most commonly used for winter pasture are velvetbeans, oats, and rye. Lands from which general farm crops have been harvested are also used.

Many hogs are kept on the range in spring and summer but are placed on fields of peanuts or peanuts and corn from late in August to early in October for fattening. Some farmers place their sows and pigs on oats and rye in spring and allow them to graze weed land and idle land in summer. By careful planning, temporary pasture for hogs may be had at all times. The temporary pasture program for hogs recommended by the Florida Department of Agriculture includes oats, rye, and pearlmillet grazed when about 6 inches high; cowpeas grazed when the first blooms appear; and corn, peanuts, sweetpotatoes, and chufas grazed after maturity.

Grasses, including oats, rye, pearlmillet, and corn, are fertilized with 150 to 200 pounds an acre of nitrate of soda, or equivalent, applied as a top dressing or side dressing. Results of fertilization are usually more satisfactory if about a third is applied soon after the plants begin to grow and the rest at intervals during the grazing season. For sweetpotatoes, 600 to 1,000 pounds of 4–8–10 or 3–8–8 fertilizer are used. Cowpeas, peanuts, and chufas are usually grown without fertilizer, and tests have shown that these respond little to fertilization.

Only a small acreage of improved permanent pasture is in the county, and that mainly of carpetgrass and Bermuda grass. Research at the Florida Experiment Station has shown that there are a number of permanent pasture plants suitable for use. In establishing permanent pastures, attention should be given to proper seeding, mowing, and fertilization. The county agent's office can furnish the latest recommendations covering these practices for different kinds of pasture.

Good pastures are needed on most farms. Every farm includes some soils that are suitable for one or more permanent pasture plants. Most of the pasture plants grow best on moist soils, but some of them will grow well on comparatively dry soils. Pasture establishment on

soils that are flooded for extended periods or on soils that are very dry should not be attempted. The apparent adaptations of the various natural soil groups for growing different pasture plants are given in table 7.

TABLE 7.—*Suitable plants for use in temporary and permanent pastures on the soil groups of Alachua County, Fla.*

[Blank spaces indicate no suitable pasture plants]

Soil group	Temporary pasture	Permanent pasture
1	Oats, rye, pearlmillet, peanuts, velvetbeans, and chufas.	Bahiagrass, Pangolagrass, Bermuda grass, Napiergrass, alyceclover, lespedeza, and kudzu.
2	do	Bahiagrass, Pangolagrass, Bermuda grass. Napiergrass, and alyceclover.
3	do	Do.
4	do	Do.
5	do	Bahiagrass, Pangolagrass, Bermuda grass, carpetgrass, Napiergrass, alyceclover, and lespedeza.
6	Oats, rye, pearlmillet, peanuts, and velvetbeans.	Bahiagrass, Pangolagrass, Bermuda grass, carpetgrass, Dallisgrass, Napiergrass, alyceclover, clovers, and lespedeza.
7	Oats, rye, pearlmillet, peanuts, velvetbeans, and chufas.	Bahiagrass, Pangolagrass, Bermuda grass, carpetgrass, Napiergrass, alyceclover, clovers, lespedeza, and kudzu.
8	Oats, rye, pearlmillet	Bahiagrass, Pangolagrass Bermuda grass, carpetgrass, Dallisgrass, Napiergrass, alyceclover, clovers, and lespedeza.
9		Bahiagrass, Pangolagrass, Bermuda grass, carpetgrass, Napiergrass, clovers, and lespedeza.
10 [1]	Oats, rye, pearlmillet	Bahiagrass, Pangolagrass, Bermuda grass, carpetgrass, Dallisgrass, Napiergrass, clovers, and lespedeza.
11 and 12		

[1] Drainage is usually required for pasture establishment.

ESTIMATED YIELDS

The estimated average acre yields of the principal crops that may be expected over a period of years are given for each soil in table 8. These estimates are based primarily on data obtained from the Departments of Agronomy and Horticulture of the University of Florida Agricultural Experiment Station at Gainesville and also from interviews with farmers, the county agent, teachers, and others who have had experience with the agriculture of the county. It is not to be expected that these yields will be obtained on every farm, as the soils vary, the weather changes from year to year, and management practices differ. As averages, however, they are as reasonable as can be obtained with present information, and they serve to bring out the relative productivity of the soils shown on the map. No yields are given for citrus fruits, pecans, or tung because of the variability of the management practices.

TABLE 8.—*Average acre yields of the principal crops that may be expected over a period of years on each soil in Alachua County, Fla.*[1]

[Blank spaces indicate that crop is not suitable to or not grown on this soil]

Soil	Field crops									Truck crops											Permanent pasture
	Corn		Peanuts		Corn and peanuts, interplanted[2]		Cowpeas for hay	Bright tobacco	Sugarcane for sirup	Beans, lima	Beans, string	Cabbage	Celery	Cucumbers	Eggplant	Peppers	Sweetpotatoes	Okra	Squash	Watermelons	
			Nuts	Hay	Corn	Nuts															
	Bu.[3]	*Bu.*[4]	*Lb.*	*Tons*	*Bu.*	*Lb.*	*Tons*	*Lb.*	*Gal.*[3]	*Crates*	*Crates*	*Tons*	*Crates*	*Crates*	*Crates*	*Crates*	*Bu.*	*Crates*	*Crates*	*Carloads*	*Cow-acre-days*[6]
Alachua loamy fine sand	25	35	500	0.8	20	400	1.2		275					175			125	150	140		200–300
Alluvial soils, undifferentiated																					
Archer-Jonesville fine sands	15	25	850	.6	12	725	.8	50	225					150			80	125		0.5	125–250
Arredondo-Fellowship loamy fine sands	18	30	650	.7	15	550	1.0		250	85	90	8		150	135	175	100	125	135		150–300
Arredondo loamy fine sand-fine sand	16	25	650	.7	12	550	1.0	50	250	80	90	7		150	125	175	100	125	135		125–250
Bayboro loamy fine sand																					225–450
Bladen loamy sand	20	30							250	95	110	9		160	150	200	135		140		200–400
Blanton fine sand	9	18	550	.4	8	450	.6	800	175					125			60	100			100–200
Shallow phase	12	20	650	.5	10	550	.7	900	200					150			80	100			125–250
Chiefland fine sand	10	18	750	.5	8	650	.6	800	175					125			60	100		.5	100–200
Fellowship gravelly loamy fine sand, undulating phase	16	26			14	450			225								90				125–250
Fellowship loamy fine sand:																					
Rolling phase	16	26			14	450			225								90				125–250
Undulating phase	18	30			15	500	1.0		250	100	110	8		160	135	175	100	125	140		150–300
Fort Meade loamy fine sand	18	30	600	.7	15	475	1.0		275	95	105	8		150	140	190	100	135	135		150–300
Gainesville-Arredondo loamy fine sands	18	30	650	.7	15	550	1.0		250					150			100	125			150–300
Gainsville loamy fine sand:																					
Rolling phase	17	28	600	.7	14	475	1.0										90	115			125–250
Undulating phase	20	33	650	.7	17	550	1.0		250					150			100	135			150–300
Hernando-Jonesville fine sands	15	25	850	.6	12	725	.8	950	225					150			80	125		.5	125–250
Jamison loamy fine sand	20	28	650	.7	16	550	.0		250								100	150			150–300
Jonesville-Hernando fine sands	12	20	800	.6	10	675	.7	900	200					125			70	100		.5	110–220
Kanapaha-Bladen complex																					
Kanapaha fine sand	9	18			8	450	.6	800	175					125			60				100–200
Lakeland fine sand:																					
Deep phase																					
Undulating phase	10	18	650	.5	8	650	.7	750	175					125			60	100		.5	100–200
Leon fine sand																					
Made land																					
Mines, pits, and dumps																					
Orlando fine sand	16	25	650	.5	14	550	.8		250	85	95	7		150	125	175	90	125			125–250
Peat													525								200–450
Peaty muck																					
Plummer fine sand																					150–325
Rex loamy fine sand	14	23			12	500	.7	800	200	80	90	5		150			80	100			125–250
Shallow phase	17	26			14	550	.8	800	225	80	90	6		150			85	125			150–300
Rutlege fine sand																					200–400
Rutlege loamy fine sand, shallow phase																					
St. Lucie fine sand																					
Scranton loamy fine sand-fine sand	22	35			17	450	1.1		275	110	125	9		175	150	200	150	150	150		200–400
Swamp																					
Water and grass																					

[1] Based on prevailing management practices, which are discussed in the sections on General Grouping of the Soils and on Soil Management, except for permanent pasture, which is based on improved management.

[2] Peanuts with corn in every other row of peanuts; yields of peanuts are about ¼ to ⅓ lower when corn and peanuts are planted in alternate rows.

[3] Yields to be expected without the use of fertilizer.

[4] Yields to be expected when fertilized at planting time with 200 pounds of 5-7-5 or similar mixture containing 75 pounds of zinc sulfate per ton and 100 pounds of nitrate of soda or sulfate of ammonia 40 to 50 days after planting.

[5] Through use of improved varieties the sirup yields of sugarcane may be doubled on most soil types.

[6] Cow-acre-days, used to express the carrying capacity of pasture land, is the product of the number of animal units carried per acre multiplied by the number of days that animals can be grazed without injury to pasture; for example a soil that supports 1 animal unit per acre for 360 days rates 360, a soil supporting 1 animal unit on 2 acres for 180 days rates 90, and a soil supporting 1 animal unit on 4 acres for 100 days rates 25.

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FORESTS AND THEIR MANAGEMENT[6]

Forests occupy more than half the land area of the county. Most of the soils in the forested areas are either unsuited to or may not be needed for cultivated farming or improved pasture. Good forest management should be practiced on lands that are likely to remain in forest. The restoration of all forest resources and their maintenance on a maximum-yield basis are of major importance in the proper development of the county. Once restored to full productivity, the vast forest areas will contribute tremendously toward the wealth of the county, the permanence of its forest products industries, increased tax revenue, and the security and well-being of much of the population.

Forest trees, like pasture grasses or cultivated crops, show a decided preference for certain soils or soil conditions. Nature, throughout the ages, has developed one or more tree species for every type of soil that is suited to tree growth. The practicability of treating soils with fertilizer or other conditioning elements for forest trees has not yet been fully demonstrated. Reforestation should therefore be carried on with tree species known to be suited to the particular areas considered for reforestation. Usually it will not be difficult to determine what trees will be best suited to a certain location because, in most cases, there are enough trees of the original growth remaining on or adjacent to such areas to provide abundant evidence as to the best species.

SUITABLE SPECIES

Six of the seven species of pines native to Florida are found in Alachua County. Longleaf and slash pines constitute most of the forest growth and are valuable native species. They are the only two species of commercial importance for naval stores, and they also produce the finest lumber and other wood products.

Longleaf pines are well suited to the well-drained undulating sandy soils of soil group 3. They will also grow on Lakeland fine sand, deep phase, which is not moist enough for slash pine. Although tolerant of somewhat dry locations, slash pines will thrive best on most of the poorly drained soils of the flat woods, group 9. They are also well suited to a wide variety of soils. They will grow successfully on lands too poorly drained for longleaf pine, such as Bayboro and Rutlege loamy fine sands, but are not so drought-resistant as longleaf pine. Since slash pine grows more rapidly than longleaf pines, is a slightly better tree for naval stores, and its seedlings can be much more successfully transplanted, it is a favorite tree for reforestation.

Redcedar is an important native forest tree suited to a wide variety of soils. Although making its most rapid growth on soils underlain by limestone or marl, it will grow well on all types of low and high hammock soils.

Many valuable hardwood trees are found on the soils of both the low and high hammocks (pl. 8). Among those suited to the deeper drier hammock soils are hammock hickory, black cherry, linden, magnolia, red oak, post oak, and redgum. On the heavier and more productive but imperfectly drained hammock soils, swamp chestnut oak,

[6] Prepared by L. T. Nieland, extension forester, Florida Agricultural Extension Service.

elm, hackberry, ash, red mulberry, and sweetbay are interspersed with a great variety of noncommercial hardwood trees. The redgum and magnolia of the high hammocks succeed equally well on the low moist hammock lands.

Commercially important trees of the swamps are pondcypress and blackgum. These are well suited to Swamp, Peat, and Peaty muck, which may be submerged under 1 foot or more of water for long periods.

RECOMMENDED MANAGEMENT

Since forest lands in the county are partly or wholly understocked, the establishment of a full stand of timber is usually the first step in any forestry program. Two methods may be used to restock the stand—direct planting or natural reproduction. The newly reforested area must be protected from burning or the entire young forest may be eliminated in a single fire.

Where the area to be reforested is relatively small, where time is important, or where seed trees are lacking, direct planting to forest seedlings is advisable. The advantages of direct planting are: (1) A forest can be established in the shortest possible time, (2) the desired species can be obtained, (3) the forest can be established in the exact area desired, and (4) the spacing and number of trees an acre can be controlled. Suggested spacings for planted forest trees are 8 feet by 8 feet for pines and 6 feet by 6 feet for redcedar.

Where the soils are suitable the trees recommended for planting are slash pine for lumber, fuelwood, and naval stores; yellow-poplar and white oak for lumber; black cherry for lumber and cabinet wood; native Florida redcedar for fence posts, pencil wood, cabinet wood, Christmas trees, and gully erosion control; and slash pine and native Florida redcedar interplanted for windbreaks.

Where there are sufficient seed trees (six or eight large well-formed trees of desirable species that are well distributed an acre), where time is not important, and when the areas to be reforested are extensive, the restocking may be by natural reproduction.

With few exceptions the forest contains a high percentage of cull trees—worked-out turpentine timber of small diameter; crooked, fire-scarred, excessively limby trees; species of little or no commercial value; or trees severely damaged by insects or diseases. In past cutting operations, only sound high-value timber was cut, leaving most or all of the defective trees. The removal of undesirable trees to make room for a new forest of desirable high-value species is called improvement cutting. Such cutting is often of primary importance in good forest management.

Understocked stands, caused largely by forest fires and destructive cutting, are common in forested areas. The trees in such scattered stands have too much room, and consequently the lower branches do not die and drop to the ground while they are small, as happens in crowded stands of young timber. Since these trees do not prune themselves naturally, they must be pruned to at least a 16-foot log length in order to produce clear knot-free lumber. A tree-pruning saw mounted on a pole is recommended, and the trees must be pruned while young and of small diameter. Short trees, less than 40 feet high, should be pruned twice because it is best not to remove more than

one-third of the living crown of the tree. Unless young open-grown trees are pruned, they will be excessively limby and provide only knotty low-value lumber.

Although most forest stands are understocked, in some small patches of timber the young trees are crowded excessively. In such areas thinning may be desirable. Thinning hastens tree growth and at the same time may provide an early return from the forest if the thinnings can be utilized as fuel or pulpwood. Usually it will be best to wait until the trees have reached 30 feet or more before thinning them. Good judgment must be exercised in thinning.

Since fire is the greatest destroyer of forest, forest lands must be protected at all times. Even the most destructive use of the ax and saw cannot equal fire in ravaging the forest, since only the larger trees may be used commercially. Fire, however, destroys both large and small trees. Millions of small trees are killed by fire while they are still hidden in the grass. Fire also destroys much of the vegetation that must go back to the soil as humus to help maintain soil productivity, to increase the water-holding capacity of the soil, and to obtain proper development of the soil flora and fauna.

MORPHOLOGY, GENESIS, AND CLASSIFICATION OF SOILS

Soil is the product of soil-forming processes acting on materials deposited or accumulated by geologic agencies. The characteristics of the soil at any given point are determined by (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil material has accumulated and existed since accumulation, (3) the plant and animal life on and in the soil, (4) the relief or lay of the land, and (5) the length of time the forces of soil development have acted on the soil material (*18*).

Parent material that is extreme in character, either chemically or physically, tends to dominate other factors of soil formation. Climate and vegetation are considered active factors of soil formation, since they bring about changes in the parent material. The direction and magnitude of these changes are affected by the parent material and by the surface relief. Relief affects the quantity of water entering the soil, the removal of material from the surface, and the position of the water table with reference to the profile. Certain kinds of relief limit the possible effects of the other factors of soil formation and largely govern the kinds of profiles that can be expected. Hilly relief commonly means that profiles will be shallow and indistinct. All changes take time, and thus age becomes a factor in soil genesis. The effects of the factors of soil formation are closely interrelated and seem to be in part interchangeable. No generalizations can be made with regard to the effects of a single factor unless the other four have been defined.

Information regarding the physical and chemical composition of the soils is limited, and consequently a discussion of soil genesis must be correspondingly incomplete. The purpose of this section is to present information about the principal morphological characteristics of the soils of the county, to indicate their classification into great soil groups and orders, and to discuss briefly their genesis.

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FACTORS OF SOIL FORMATION

The chief parent materials, identified as Pleistocene terrace deposits (*8*), cover most of the uplands in the county. Less important sources of parent material are the Ocala limestone and the Hawthorn formation, which have apparently not contributed more than part of the parent material for any of the soils. The Pleistocene terrace deposits (fig. 2) have been identified as the Coharie formation in the

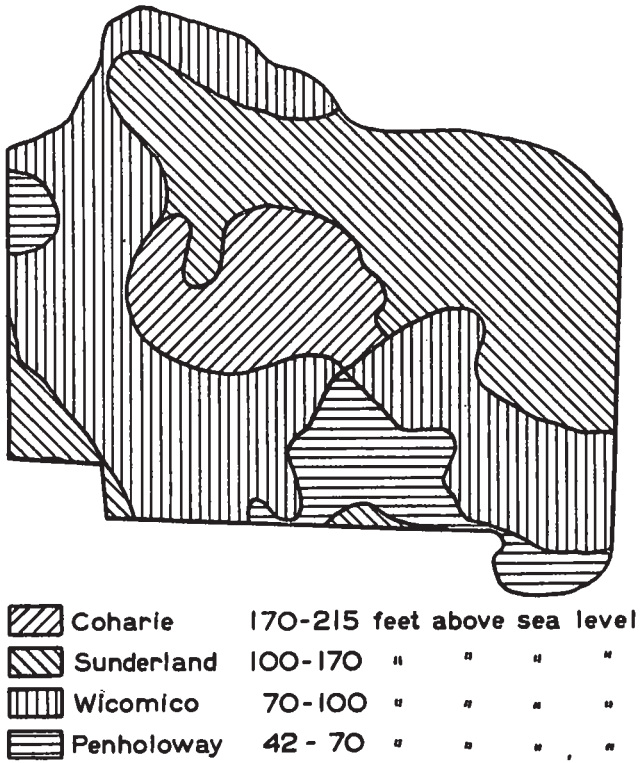

FIGURE 2.—Marine terraces in Alachua County, Fla. (Courtesy of Fla. Geol. Survey.)

central part of Alachua County, the Wicomico formation in the western and southeastern parts of the county, the Penholoway terrace in the south-central part and along the western border, and the Sunderland formation in the northern and northeastern parts, with smaller areas in the southwestern corner and along the southern border. These unconsolidated deposits generally cover the Hawthorn formation, which overlies the Ocala limestone in much of the county. The Ocala limestone is at or near the surface only in the southwestern part.

The Pleistocene terrace deposits consist largely of thick beds of acid sand. The thickness of these beds and the texture of the sand varies, but most of the deposits are predominantly sand and fine sand. There is some loamy sand and occasionally there are thin beds of clay or clayey sediments. As a whole, the finer textured sediments are relatively unimportant to the soils of the county.

The Ocala limestone is light gray to yellow, is generally soft and porous, and frequently contains some phosphate. It includes many underground channels and solution cracks, and its surface is marked by numerous sinkholes that still show through the overlying formations. In most of the county this limestone is buried to considerable depths. Part of the material in the deeper profiles of the Archer and Hernando soils has probably been derived from the limestone.

The Hawthorn formation, exposed in Devils Mill Hopper northwest of Gainsville, consists chiefly of gray phosphatic sand with lenses of green or gray fuller's earth. In places it is cemented and appears as a phosphatic sandstone or as a sandy phosphatic limestone. While disintegrating, it sometimes appears as a light vesicular sandstone from which the phosphate and lime have been removed by solution. The top of the formation is usually irregular. The phosphate matrix occurs at the upper part of the formation but is of relatively low phosphate content as compared with the deposits of central Florida. Various pits still exist from former mining operations. This matrix has contributed part of the parent material for some of the soils.

The great quantity of sandy sediment in the parent material affects the character of most of the soils by restricting horizon differentiation. Many of the soils lack distinct horizons because of the highly siliceous character of the mineral matter composing them. Those soils that have distinct horizons owe them to organic matter or to the presence of thin beds of finer textured material.

Alachua County has a humid warm temperate climate (*19*). It lies within the area having a warm wet climate with no distinct dry period and with hot summers. The climate is uniform over the whole county and is not responsible for differences among the soils. The county is part of the broad belt in which Red-Yellow Podzolic soils are formed from parent material of intermediate composition. These soils are formed on well-drained sites from materials that are not extreme either in their chemical or physical composition. Development of the Red-Yellow Podzolic soils, however, seems to be restricted to parent materials containing moderate quantities of quartz or its equivalent. There are no parent materials that meet this requirement fully in the county, although three series have been included in the Red-Yellow Podzolic group.

The relief, or lay of the land, is level or nearly level over most of the county. The eastern half, known as The Flatwoods, is low and level enough so that soil-forming processes are dominated by ground water. Important acreages of Ground-Water Podzols and "Humic gley" soils are included. The "Humic gley" soils occur also in other parts of the county that are low and relatively level. Parts of the county, especially northwest of Gainesville, are undulating to rolling. In such areas, zonal soils would be formed from sediments that were lower in quartz. With a few exceptions, however, the surface deposits are extremely siliceous and have not permitted the formation of zonal soils. Hilly relief is infrequent, but an area of hilly sands is in the southwestern part.

Vegetation does not seem to have been the cause of more than a few of the differences among the soils. The county lies wholly within the southeastern pine forest region (*13*) and was originally covered with longleaf pine. Saw-palmetto and some grasses grew among the pines, especially on the somewhat poorly drained soils. The long-

leaf pine vegetation was common on the deeper sandy soils and on those that were not poorly drained. A hammock vegetation of oaks, hickory, magnolia, and pines grew where the soils are less deep over limestone or where they are more fertile. This vegetation is now restricted largely to Kanapaha fine sand and Kanapaha-Bladen complex. A few sections are treeless and are known as prairies, but most of these are relatively small, although one or two have diameters of 3 or 4 miles. Coarse grass vegetation was common on the prairies.

Time has not been an important factor in differentiating the soils. The Alachua and Jamison soils are in the early stages of horizon differentiation because the sediments have been deposited recently, but other soils in the county have been in place a long while. Most of the soils consist of minerals that are highly resistant to change. Minerals that are common source material for clay are largely absent from the deposits. Consequently, there have been few and small changes in the character of the soils even though they have been exposed to weathering for long intervals.

Within the county the prominent differences in soils are due to parent material and relief; lesser differences are due to the factors of vegetation and time. Because of the sandy character of the soils of the county, those classified as zonal and showing the effects of climate and vegetation are not typical of the zonal order. On the other hand, there are good representatives of the intrazonal and azonal orders both as to profile and extent.

CLASSIFICATION OF THE SOIL SERIES

The soils of the county are classified into great soil groups, which in turn are classified into zonal, intrazonal, and azonal orders. The zonal order includes those great soil groups with well-developed profile characteristics that reflect the influence of climate and vegetation. Zonal soils are commonly developed on undulating or gently rolling uplands with good drainage. They are formed from parent material of intermediate physical or chemical composition that must have remained in place long enough for the differentiation of horizons. The zonal order is represented by the Red-Yellow Podzolic group.

Intrazonal soils have well-defined profiles that reflect the dominating influence of a local factor of soil formation, as relief or parent material, or time. They are formed over a narrower range of relief than zonal soils but from a wider range of parent material. As in the zonal soils, time is required for the differentiation of profile horizons. The intrazonal soils include the Bog, "Humic gley", "Low-humic gley", and Ground-Water Podzol groups. Good representatives of these groups are in the county.

Azonal soils lack well-defined solums because youth, the nature of the parent material, or the relief has prevented the development of horizons. This group includes soils that are receiving increments of material periodically at the present time, those that are formed from highly siliceous deposits resistant to weathering, and those that occupy steep slopes. In this county only the first two of these conditions are represented in significant areas. There are small areas of Alluvial soils and larger areas of Regosols.

The soils of the county are classified into great soil groups and orders, and their factors of formation are given in table 9.

No column is included in table 9 for climate, which is one of the important factors of soil formation. The climate is uniform throughout the county and is described in the section on Climate. Because of its uniformity, climate has been a minor factor in determining soil differences.

The parent materials are all Coastal Plain sediments, and most of them are unconsolidated. Part of the material in certain soils seems to have come from the Ocala and Hawthorn formations, which are consolidated or partly consolidated.

The two series of hydromorphic soils placed in the "Low-humic gley" group have some of the characteristics expected in the Planosol profile. The poorly drained Bladen and Fellowship series seem to have pseudo profiles—the horizons are actually strata of differing character, not genetically related horizons. A marked difference in texture exists from the surface layer to the next underlying one, which is a feature of Planosols.

The eight series that have been placed in the Regosols group include soils with little or no horizon differentiation in deep sands. The essential differences in these profiles are in the thickness of the sand layer over finer sediments and in the character of the underlying material. These soils lack horizons required by the zonal and intrazonal groups.

MORPHOLOGY OF SOILS REPRESENTING THE GREAT SOIL GROUPS

Seven great soil groups are recognized in Alachua County. Series have been selected as examples of four of these groups, and detailed profile descriptions are given for the selected series. In addition to the profile description of the example, the relations of other series to it are indicated. In the study of the descriptions it should be recognized that some of the series, especially those of the zonal order, do not conform well to the definitions of their respective great soil groups. The descriptions are included, however, to permit comparisons of these soils with more typical representatives of the great soil groups in other regions.

RED-YELLOW PODZOLIC SOILS

Red-Yellow Podzolic soils are defined as a zonal group of soils having thin organic and organic-mineral layers over yellowish-brown leached layers, which rest upon illuvial red or yellow horizons. They have developed under a deciduous or mixed forest in a warm-temperate, moist climate (*18*). In Alachua County the Archer, Hernando, and Arredondo series have been included in the Red-Yellow Podzolic group.

The Archer is red or reddish brown in the deeper horizons, whereas the others are yellow or yellowish brown. The Archer and Hernando soils differ primarily in the color of the deeper profile; in both soils the sequence and thickness of layers correspond fairly well to the horizons expected in typical Red-Yellow Podzolic soils. There is some question, however, about the genetic relationship between the layers. The nature of the profiles suggests that the layers may be separate deposits rather than soil horizons that developed simultaneously.

TABLE 9.—*Classification of soil series of Alachua County, Fla., into orders and great soil groups*

Great soil group and series	Relief	Parent material	Vegetation	Time[1]
ZONAL ORDER				
Red-Yellow Podzolic soils:				
Archer	Nearly level to gently sloping	Thin beds of fine sand and sandy clay over Ocala limestone; slightly phosphatic.	Pine, oak, and hickory	Long.
Hernando	do	do	Oak, magnolia, and pine	Do.
Arredondo[2]	Undulating to sloping	Sandy, slightly phosphatic beds from or over Hawthorn formation.	Oak, hickory, and pine	Do.
Not classified:				
Gainesville[3]	Undulating to rolling	Slightly phosphatic beds of fine sand and fine sandy loam over Hawthorn formation.	Oak, hickory, magnolia, and pine	Do.
INTRAZONAL ORDER				
Bog soils:				
Peat[4]	Level	Plant residues	Cypress, gum, bay, and prairie	Long.
"Humic Gley" soils:[5]				
Bayboro	Level to nearly level	Thick deposits of unconsolidated fine sandy loam and clay.	Oak, magnolia, cabbage palmetto, and prairie.	Do.
Rutlege	do	Thick beds of acid sand and loamy sand	Cypress, gum, bay, and prairie	Do.
Scranton	do	do	Loblolly and slash pines	Do.
"Low Humic Gley" soils:[5]				
Plummer	do	do	Cypress, gum, and slash pine	Do.
Bladen	do	Thick beds of unconsolidated fine sandy loam and clay.	Oak, magnolia, gum, cabbage palmetto, and prairie.	Do.
Fellowship	Undulating to rolling	Thick beds of phosphatic clay overlain by thin beds of sand.	Oak, hickory, gum, magnolia, and loblolly pine.	Do.
Rex	Nearly level to undulating	Thick beds of loamy sand over sandy clay	Longleaf and loblolly pines and oak	Do.
Ground-Water Podzols:				
Leon	Level to nearly level	Thick beds of sand over sandy clay	Longleaf and slash pines and saw-palmetto	Do.

AZONAL ORDER

Alluvial soils:				
Alachua	Nearly level to gently sloping	Recent colluvial material from slightly phosphatic soils.	Oak, magnolia, and pine	Short.
Jamison	Nearly level	Recent colluvial material from acid sandy soils	Longleaf and loblolly pines and oak	Do.
Regosols: [5]				
St. Lucie	Undulating	Very thick beds of white sand	Scrub oak and sand pine	Long.
Lakeland	Nearly level to hilly	Thick deposits of unconsolidated fine sand over sandy clay.	Longleaf pine and scrub oak	Do.
Chiefland	Nearly level to undulating	Thin beds of gray sand over limestone	Longleaf pine, oak, and hickory	Do.
Jonesville	do	Moderately thick beds of unconsolidated fine sand and clay over limestone.	Longleaf pine and oak	Do.
Kanapaha	do	Thin beds of fine sand and sandy clay over limestone.	Oak, magnolia, and hickory	Do.
Blanton	do	Thick deposits of fine sand	Longleaf pine and oak	Do.
Fort Meade [6]	do	Thin beds of slightly phosphatic sand	Oak, magnolia, gum, and pine	Do.
Orlando [6]	do	Thick beds of sand and sandy clay	Longleaf and loblolly pines and oak	Do.

[1] The length of time the soil material appears to have been in place, considering the degree of profile development.

[2] The deeper parts of the profile are slightly finer textured than is common for the azonal sands, and consequently this marginal series has been included in the Red-Yellow Podzolic group.

[3] They are more sandy than the Reddish-Brown Latosols and lack the distinct light-colored A_2 horizon that is characteristic of the Red-Yellow Podzolic group.

[4] Undifferentiated as to series.

[5] See HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS, by James Thorp and Guy D. Smith. Soil Science, Vol. 67, No. 2, pp. 117–126. February 1949.

[6] Has thick dark A_1 horizons in contrast with the thin A_1 horizons of the other soils in the group. There is also a gradation from the dark A_1 through a layer of intermediate color into the deeper light-colored sands. The color profile is comparable to that of sandy Prairie soils, though distinct B horizons are lacking.

The Arredondo series is less representative of the Red-Yellow Podzolic group than the Hernando series. The Arredondo soils are similar in some ways to Regosols, in other ways to Yellowish-Brown Lateritic soils. The profile is sandy, lacks a distinct B horizon, and is yellow and somewhat heavier than that of the Regosols. Its gradual increase in clay content makes it comparable with the Gainesville soils. Although it is recognized that the Arredondo series is not a good representative of the Red-Yellow Podzolic group, its inclusion in that group seems the best way of classifying it at the present time.

Profile of Archer fine sand:

A_1. 0 to 2 inches, grayish-brown nearly loose loamy fine sand having a very weak fine crumb structure.
A_2. 2 to 16 inches, pale-yellow loose fine sand.
B_1. 16 to 18 inches, yellowish-brown friable fine sandy clay loam having a fine weak blocky structure.
B_2. 18 to 32 inches, reddish-brown to yellowish-red firm fine sandy clay faintly mottled with yellow and brown; weak medium blocky structure.
C. 32 to 56 inches, mottled purplish-red, reddish-brown, yellow, and light-gray heavy fine sandy clay that grades into Ocala limestone.

"HUMIC GLEY" SOILS

The "Humic gley" soils are an intrazonal group of soils having a mucky or peaty surface soil underlain by gray mineral soil. They have developed largely under swamp-forest vegetation, mostly in a humid or subhumid climate (*18*). In Alachua County three series have been placed in the group of "Humic gley" soils. The soils are comparable in drainage to Bog soils and have developed for the most part under swamp-forest vegetation, but they do not have the thick organic surface of the Bog soils.

The Rutlege series has been formed in depressed or level areas from very sandy deposits. It has an extremely thick black A_1 horizon that grades into a sandy C horizon. A profile description follows:

0 to 12 inches, black moist nearly loose fine sand; high organic matter content, which gives a loamy feel; very strongly acid.
12 to 40 inches, light-gray or light-gray faintly mottled with yellowish-brown, usually wet or moist, loose fine sand; very strongly acid.
40 inches +, light-gray to yellowish-white water-soaked loose fine sand that readily runs off a soil auger.

GROUND-WATER PODZOLS

Ground-Water Podzols are an intrazonal group of soils developed from imperfectly drained sandy deposits in humid regions. They have a thin organic layer over a light-gray sandy leached layer, which rests upon a dark-brown B horizon irregularly cemented with iron, organic compounds, or both (*18*). Only the Leon series belongs to this group.

The Leon series has formed from acid light-colored sands with level or nearly level relief under a vegetation of saw-palmetto and scattered pine trees. The profile is one of the most striking found in soils anywhere. The horizons are well defined, and there is a high degree of contrast between them. Differentiation of horizons seems to be due entirely to concentration of organic matter. A profile description follows:

A_1. 0 to 4 inches, medium-gray nearly loose fine sand containing some grass roots and many long large roots of saw-palmetto; very strongly acid.

A_2. 4 to 18 inches, white or yellowish-white loose fine sand; very strongly acid.
B_2. 18 to 21 inches, brownish-black hardpan consisting of fine sand cemented with organic matter; hardens on exposure to air and becomes extremely hard but brittle when dry; firm to friable when moist; very strongly to extremely acid.
B_3. 21 to 26 inches, dark-brown partly cemented fine sand; the upper 1 or 2 inches moderately hard but brittle, the rest friable; very strongly acid.
C_1. 26 to 32 inches, yellowish-brown loose fine sand; usually saturated with water in normal seasons; strongly acid.
C. 32 to 60 inches, light-gray loose fine sand having streaks of brown or gray; usually wet; strongly acid.

REGOSOLS

The Regosol group of soils is one of the most extensive and important in the county. Of the eight series, the Lakeland series is representative. Others included are the Blanton, Chiefland, Jonesville, Kanapaha, Fort Meade, Orlando, and St. Lucie series.

The Blanton soils differ from the Lakeland in that they are light gray rather than yellow and commonly have less rolling topography. The Jonesville is essentially comparable in morphology to the Lakeland soils, but it overlies limestone at moderate depths. The Chiefland series is the light-gray to white equivalent of the Jonesville series and stands in relation to the Jonesville series as do the Blanton to the Lakeland soils. The Orlando series has a thick dark A_1 horizon, which distinguishes it from Lakeland soils. Fort Meade soil is the slightly phosphatic equivalent of the Orlando soils. The Kanapaha series is similar in its morphology to the Blanton and Chiefland soils but seems to be slightly phosphatic, especially in the lower part. White very loose fine sand characterizes the St. Lucie soil.

The Lakeland soils have formed from moderately deep acid yellow sands. They ordinarily have undulating to gently rolling topography but may range from level to hilly. The profile includes a thin A_1 horizon grading into the parent material, which in turn overlies finer textured sediments. A profile description follows:

0 to 3 inches, grayish-brown (10YR 5/2)[1] nearly loose fine sand containing some organic matter; strongly acid.
3 to 36 inches, light brownish-gray (2.5Y 6/2) to pale brown (10YR 6/3) loose fine sand, strongly to very strongly acid.
36 to 50 inches, brownish-yellow (10YR 6/8) loose fine sand strongly to very strongly acid.
50 to 60 inches, light-gray (2.5Y 7/2) or pale-yellow (2.5Y 7/4) loose to very loose fine sand, strongly to very strongly acid.
60 inches +, mottled yellow, brown, and light-gray friable fine sandy loam or fine sandy clay loam; strongly acid.

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[1] Symbols express Munsell color notation.

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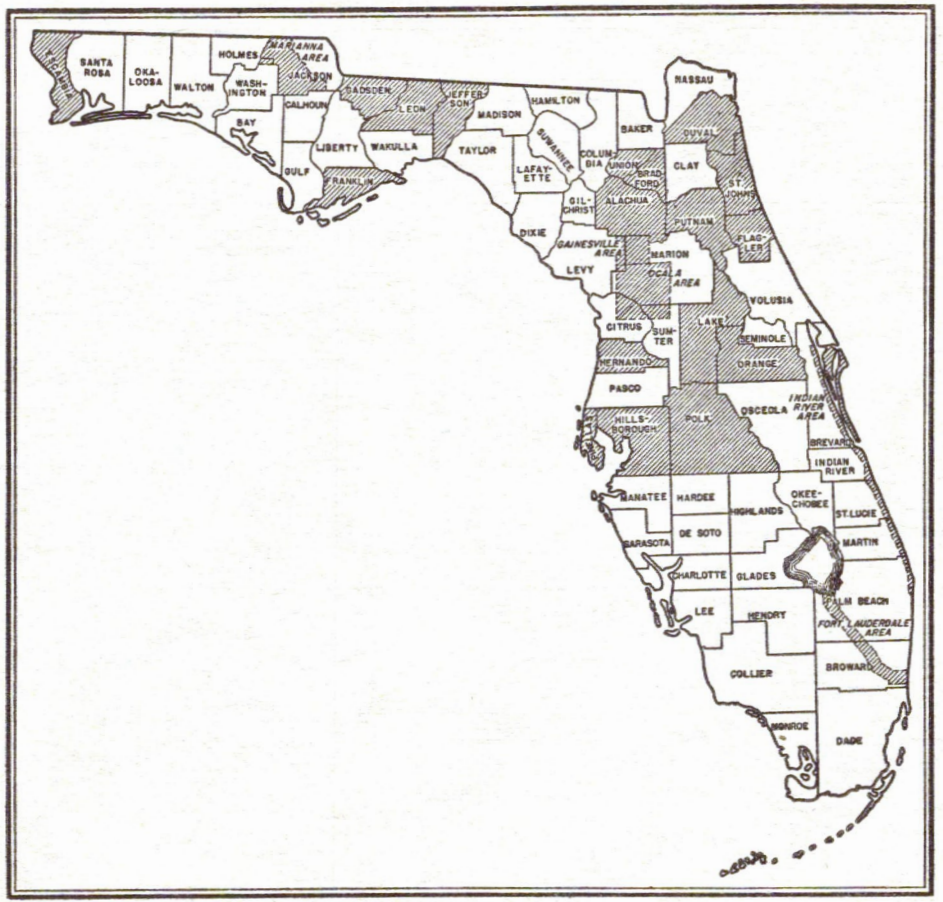

Areas surveyed in Florida shown by shading.

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