

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

SOIL SURVEY OF TAYLOR COUNTY, TEXAS.

BY

WILLIAM G. SMITH, IN CHARGE, A. E. KOCHER, R. F. ROGERS,
AND W. I. WATKINS.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1915.]



WASHINGTON
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SOIL SURVEY.

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LETTER OF TRANSMITTAL.

U S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., November 21, 1916.

SIR: I have the honor to transmit herewith the manuscript report and map covering the soil survey of Taylor County, Tex., and to request that they be published as advance sheets of Field Operations of the Bureau of Soils for 1915, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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MAP.

Soil map, Taylor County sheet, Texas.

SOIL SURVEY OF TAYLOR COUNTY, TEXAS.

By WILLIAM G. SMITH, In Charge, A. E. KOCHER, R. F. ROGERS, and
W. I. WATKINS.—Area Inspected by HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

Taylor County, Tex., is just northwest of the center of the State. The county is approximately 30 miles square and has an area of 908 square miles, or 581,120 acres. It is bounded on the north by Jones County, on the east by Callahan County, on the south by Coleman and Runnels Counties, and on the west by Nolan County.

A series of high plateau remnants, parts of the Edwards Plateau, which is continuous, except for breaks at Buffalo Gap and Cedar Gap, extend in an east-west direction through the central part of the county. They form a strip of country of very irregular outline about 2 to 16 miles wide (see fig. 2), and comprise a little more than one-fourth of the area of the county. They are a conspicuous topographic feature, rising with almost vertical walls 200 to 300 feet above the general level of the county. The elevation of these plateaus is 2,200 to 2,500 feet above sea level, and they are locally referred to as "mountains."

The outer edges of these high areas and the walls of the valleys that extend back into them are marked by steep, stony bluffs, and, as viewed from their fronts, give an impression of a very rough topography.

Their general surface, however, varies from level to gently rolling.

The remainder or lower part of the county has a plainlike surface of gently rolling to nearly level topography. It slopes gently downward from the base of the plateaus, at an approximate elevation of 2,000 feet above sea level, northward and southward to an approximate elevation of 1,750 feet along the county line. A strip of gently sloping country, one-fourth to 1 mile or more wide, including some rough eroded areas, skirts the foot of the plateaus.

There are relatively narrow strips of first-bottom and terrace lands along the streams. The first bottoms are subject to overflows. The boundaries between the plainlike country and the second bottoms, or



FIG. 1.—Sketch map showing location of the Taylor County area, Texas.

stream terraces, are for the most part obscure, and in many instances the first bottoms grade almost imperceptibly into the second bottoms.

The regional drainage of Taylor County is quite complete, practically every section being reached by some form of natural drainage way. In the higher or plateau areas the drainage ways have rather steep gradients and are confined to deep, crooked channels with rock floors, the valleys varying in width from a few yards to a mile or more. The fall of the streams is much less in the lower or plainlike country, and the channels here, though often crooked, are for the most part shallower and the bottom lands are much wider. The drainage of the southern third of Taylor County is southward, and that of the northern two-thirds mainly northward. Most of the streams are small and intermittent.

The plateau areas are sparsely settled, the greater part of the population and nearly all the cities, towns, and trading points in the county being in the lower division. About one-third of the lower land is in cultivation, while only a small part of the plateau area is tilled, most of the land being used for grazing. The population is mainly of English descent, the settlers having come from other parts of Texas and from States to the north and east. There are few negroes and Mexicans in the county. The total population is reported in the 1910 census as 26,293, or an average of about 29 persons per square mile. Probably much more than one-half the population lives in cities and towns, although the census classes only 35 per cent of the population as urban, only the population of towns of over 2,500 being classed as urban. The population of Abilene, the county seat, is reported as 9,204, and that of Merkel as 2,008. The other towns have populations of less than 500. The northern third of Taylor County is the most thickly settled section.

The lower country is well supplied with railway facilities, and for the most part with fairly good dirt roads. No railways traverse the plateau region, and parts of it are remote from shipping points. Abilene and Merkel are important shipping points for cotton, live stock, and other products consigned to Fort Worth, Dallas, San Angelo, Weatherford, Brownwood, Kansas City, St. Louis, and other markets. The larger towns of the county consume a considerable part of the local dairy and poultry products, though a large part is shipped to outside markets. The market-garden crops are sold locally.

The county has good public schools, and Abilene and Merkel have high schools and colleges as well as graded schools.

CLIMATE.

The climate of Taylor County is marked by its variability, by a moderate rainfall, and a comparatively wide annual range in tem-

perature. On the basis of the records kept at Abilene, covering a period of 32 years, the mean annual precipitation is 24.74 inches, but during that period there has been a range in annual precipitation of 26.63 inches, or from 14.97 inches to 41.60 inches. The average annual depth of snowfall is 3.6 inches.

The mean annual temperature is 63° F., the absolute maximum 110° F., and the absolute minimum -6° F.

The average date of the last killing frost in the spring is March 22 and of the first killing frost in the fall November 9, which gives an average growing season of 232 days, or more than 7½ months. The latest date of killing frost recorded in the spring is April 23 and the earliest recorded in the fall October 22.

The following table, compiled from the records of the Weather Bureau station at Abilene, gives the essential climatic data in detail by months and seasons:

Normal monthly, seasonal, and annual temperature and precipitation at Abilene.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year. (1909).	Total amount for the wettest year. (1914).	Snow, average depth.
	° F.	° F.	° F.	Inches.	Inches.	Inches.	Inches.
December.....	45.0	83	1	1.13	0.73	1.61	0.8
January.....	42.6	90	-5	.90	.06	T.	1.0
February.....	44.8	94	-6	1.08	.00	.14	1.4
Winter.....	44.1	94	-6	3.11	.79	1.75	3.2
March.....	54.9	95	17	1.38	.39	.66	.3
April.....	64.4	99	25	2.28	.38	5.34	T.
May.....	71.9	105	33	3.72	2.71	7.53	0
Spring.....	63.7	105	17	7.38	3.48	13.53	.3
June.....	78.2	110	48	3.17	4.04	1.10	0
July.....	82.2	110	54	2.40	1.09	1.05	0
August.....	81.2	105	55	1.97	.62	15.70	0
Summer.....	80.5	110	48	7.54	5.75	17.85	0
September.....	74.2	104	40	3.14	1.05	.91	0
October.....	64.2	94	30	2.33	1.94	4.08	0
November.....	52.6	88	13	1.24	1.96	3.48	.1
Fall.....	63.7	104	13	6.71	4.95	8.47	.1
Year.....	63.0	110	-6	24.74	14.97	41.60	3.6

The precipitation as a rule is not favorably distributed for crop growth. The lighter rainfall evaporates rapidly, while considerable run-off results from the heavier. Occasionally there are long periods

without rainfall, and although spring and summer precipitation may be quite heavy its distribution frequently is such that crops do not derive the benefit from it that they would from gentler soaking rains. Often in May and June and possibly later hot, dry winds from the south occur, and when these last two or three days crops are likely to suffer injury. Most of the summer crops commonly grown, except corn and garden vegetables, recover fairly well, and it is mainly because of these winds that the extensive production of corn has largely been discontinued. Cotton, kafir, milo, feterita, Johnson grass, and Sudan grass are among the summer crops that do better chiefly because of their power to withstand drought, though the yields vary according to the favorable or unfavorable nature of the season. When the rainfall is scant or poorly distributed the cotton bolls do not open well, though even in this case much of the lint is saved.

Winter crops, such as wheat and oats, are, in general, more likely to be injured by the unfavorable climatic conditions such as a scant rainfall, with long dry periods, and freezing and thawing than the summer crops. This probably accounts for the relatively small acreage of these small grain crops.

Although the temperatures are such that the soil may be worked and crops of some kind grown any month in the year, it is not deemed advisable, as a rule, to attempt to grow more than one major crop a year on the same land, it being considered better to let the soil lie fallow at times so that it may store up a reserve supply of moisture for the use of the next annual crop. However, there are exceptions to this practice, when in the judgment of the farmer the soil-moisture conditions are such as to permit the growing of a catch crop such as millet or sorghum cane in the summer, or oats and rye in the winter.

In general, the farmers of Taylor County seem to have worked out the farm practices best calculated to insure reasonably successful farming under existing climatic conditions. They select the more important drought-resistant crops, and for the most part follow the practice of growing only one major crop a year on the same land. As a rule the soil is tilled with a view to conserving soil moisture. Further study and experience, however, will likely result in a relatively smaller acreage in cotton, a larger acreage of drought-resistant cereal and forage crops, grown to sustain a greater live-stock industry, and a more extensive acreage of the minor crops for home consumption, cotton and live stock remaining the principal sale products.

AGRICULTURE.

Taylor County was organized, with its present boundaries, in 1878. The country included consisted of open prairie and forest lands, both

of which were used as open range for cattle and horses, no cultivated crops being grown in the early days. Later sheep and goats were grazed on this range, and still later some crops were grown in connection with the live-stock industries. Prior to 1890 the principal industry was the raising of cattle, horses, mules, sheep, and goats on native pasturage, and crop production was of secondary importance. About 1882, with the construction of the Texas & Pacific Railway, the extensive settlement of the county began, and this marked the beginning of transition from free-range stock raising to the type of crop production and stock raising on fenced lands which prevails at the present time.

The census of 1880 reports 157 acres in wheat and 73 acres in corn, in all 230 acres, or 0.04 per cent of the area of the county.

The census of 1890 reports 5,610 acres in oats, 3,870 acres in corn, 3,793 acres in cotton, 3,429 acres in hay grasses, and 2,724 acres in wheat. These crops occupied nearly all the cultivated area. Nearly 12,000 peach trees are reported. The census of 1900 reports 27,907 acres in cotton, 9,690 acres in corn, and 7,487 acres in coarse forage, with about 2,000 acres each in millet and oats, and about 800 acres in wheat. The number of peach trees had increased to about 30,000. The 1900 census reports the value of animals sold and slaughtered as \$123,095, poultry \$13,825, and dairy products, excluding home use, \$9,204.

The present agriculture of Taylor County consists of the production of cotton and live stock for sale, with cereal and forage crops grown largely in support of the live-stock industry. In addition to the large quantities of such crops produced, the census of 1910 reports an expenditure in the county of \$55,736 on 635 farms for feed. Small grains, fruits, and vegetables have a minor place as market products, but are important for home and local use.

In the census of 1910 a total of 101,075 acres is reported in cotton in 1909, with a total production of 17,725 bales, or 0.175 bale per acre. Kafir and milo were the crops of second importance, 20,961 acres being reported in these crops. A total of 1,588 acres is reported in corn, producing 12,659 bushels, 1,557 acres in wheat, producing 8,320 bushels, and 1,227 acres in oats, producing 9,262 bushels. Hay and forage crops occupy an important acreage. Tame or cultivated grasses, mainly Johnson grass, are reported on nearly 3,000 acres, and wild grasses on about 900 acres. A total of 15,892 acres is reported in coarse forage. Peanuts are reported on 92 acres, sweet potatoes, Irish potatoes, and other vegetables on about 500 acres, and sorghum cane on 876 acres, with a very small acreage devoted to the production of broom corn and cowpea seed. The same authority states the number of peach trees as about 47,000, apple trees 2,500,

grape vines 8,000, and pecan trees more than 2,000. A few acres of blackberries and dewberries also are reported.

The following table, compiled from the census of 1910, gives the relative value of agricultural products of Taylor County:

Cereals.....	\$179, 229
Other grains and seeds.....	1, 721
Hay and forage.....	179, 096
Vegetables.....	22, 895
Fruits and nuts.....	3, 231
All other crops (mainly cotton).....	1, 500, 430
Live stock and products:	
Animals sold or slaughtered.....	496, 797
Dairy products, excluding home use.....	137, 138
Poultry and eggs.....	112, 342
Wool, mohair, and goat hair.....	5, 219
Total value.....	\$2, 611, 098

Of the domestic animals sold or slaughtered, the census reports the following numbers:

Calves.....	2, 358	Swine.....	7, 949
Other cattle.....	9, 461	Sheep and goats.....	2, 650
Horses and mules.....	1, 344		

The decade 1900-1910 was marked not only by a large expansion of the acreage in cultivated crops, but also by a considerable readjustment of crops in fitting the agriculture to the climatic conditions. In this readjustment corn and small grains have decreased in importance, while the cotton acreage has greatly increased. Hay and forage crops and milo and kafir have received greater attention, and live-stock products have made large gains.

All the crops of the county, according to the 1910 census, are produced on about one-fourth of its total area. The live-stock industry is supported in part by the cultivated area, but mainly by the native grazing afforded by the remaining lands of the county. Possibly the native pastures equal or even exceed in importance the field-grown crops used in support of the live-stock industry. At any rate, the county is sometimes spoken of as a grazing country, and the profits derived from the production of live stock are relatively large.

Cotton is the largest single product shipped out of the county, while live stock and live-stock products rank second. Of the latter, the cattle are the most important, though hogs are receiving increasing attention, and are now shipped in carload lots on a cooperative basis to encourage hog raising both on the small farms and on an extensive scale. Dairy products, consisting of milk, cream, and butter, are of considerable importance. There are about 15 cream stations in the county, to which farmers deliver their cream once or twice a week, and the creameries ship the cream to Brownwood, San Angelo,

Weatherford, and Fort Worth, where it is either sold or converted into butter. There are good markets for dairy products at Abilene and Merkel, where the milk and cream are largely sold direct to consumers.

Poultry raising is an important and growing industry. The poultry consists mainly of chickens and turkeys, with a few ducks and geese. Some of the eggs are sold at local markets, and some are shipped out of the county. The sheep-raising and goat-raising industries are not extensively developed in the county, but apparently are increasing in importance. Horses and mules also seem to be receiving increasing attention, especially the latter.

The wheat grown in the county is largely disposed of at a flour mill at Abilene, and the flour is sold earlier than that from northern-grown wheat. Early harvested oats are sometimes shipped out of the county in carload lots to northern markets and sold at good prices, while later in the season northern-grown oats are shipped into the county at much lower prices.

It is the expressed opinion of persons within the county who have given the matter some study that too great an acreage is given to the cotton crop, and that it would be better, under normal conditions, to reduce the cotton acreage about one-half or more, and grow instead more of the proved drought-resistant feed crops, such as kafir, milo, and feterita, and hay and forage crops such as Johnson grass, Sudan grass, and sorghum, in order to extend the live-stock industry. At the same time it is suggested that the farmer might well grow enough small grains, fruits, and vegetables to supply all home needs, extending only in some special cases the acreage in small fruits and garden vegetables where these can be advantageously irrigated and disposed of as money crops at convenient markets.

The topographic features of Taylor County exercise a marked influence on the character of agriculture. The higher or plateau areas are locally characterized as "dry, stony pasture land." These lands are largely used for grazing live stock of various kinds, a relatively small area being used in growing field crops. On the other hand, the lower country, locally characterized as "farm lands," is practically all that is well suited to cultivation; at present about one-third is used for growing farm crops and the remainder for grazing.

At present the type of farming practiced is not determined by the character of the soil, crops being grown on all the soils. However, it is recognized that the sandy soils have a somewhat greater drought-resisting power than the heavier textured soils, and that the stony areas and creek-bottom lands more or less subject to overflow are better adapted to pasturage, though considerable areas of land well suited to cultivation are still used for grazing.

It is difficult to grow leguminous crops because of the generally unfavorable distribution of the rainfall. It is also considered unsafe to turn under coarse manure or matured vegetation, owing to the danger of drying out of the soil. The plowing under of green crops for manure, however, is considered a safe method of adding organic matter to the soil, as this vegetation soon rots and forms a part of the soil without causing much loss of moisture. The common practice of planting row crops, such as cotton, corn, grain sorghums and some others, in listed trenches gives good results, as it seems to insure greater certainty of germination, while subsequent intertillage, gradually filling the furrows, leaves the roots some depth beneath the surface where the moisture conditions are favorable.

As soon as possible after harvesting an annual crop, the better farmers plow or disk the land, and subsequently harrow it at intervals until planting time for the next crop, in order to conserve the moisture by keeping down weeds and maintaining a soil mulch. This practice is especially important on the soils of heavier texture, which have a strong tendency to bake and crust after heavy rains. The cultivation of fallow land is not extensively practiced, but row crops are quite generally cultivated frequently, with a view to saving all available soil moisture for crop growth.

Many native grasses and weeds grow in the pastures in early spring, and afford green pasturage until June or later, according to the amount and distribution of the rainfall. The weeds grow first, and are followed by the grasses, commonly called mesquite grass. These grasses cure on the root in early summer and furnish dry grazing until the following spring, unless overgrazed. Fall and winter pasturage on these grasses is supplemented by the green leaves of the mesquite and live-oak trees, and also by the mesquite seed pods, while in some years the various oak trees supply large quantities of acorns, which are eaten by hogs, and by some other stock when other food is not available.

The water supply for live stock and household use and even for city and town use is rather limited. Only a few of the streams heading in the plateaus are permanent, springs are rare, and deep bored wells giving good water are scarce. Most of the water supply is from "tanques," or open excavations in the ground or dammed catchment basins in which surface waters are collected. In unusually dry seasons the water supply in these tanques gets very low or, in some instances, disappears.

Most of the farms are apparently well equipped with modern implements suitable for growing and handling the staple crops commonly grown in the county, including both walking and riding plows of moldboard and disk type, disk and spike-tooth harrows, riding

and walking cultivators, seed planters and grain drills, mowing machines, and grain binders. Two-horse to six-horse teams are commonly used, according to the size and character of the implements and the character of the soil. The tractor engines are rarely used, except in connection with a few thrashing outfits in the county.

The farmhouses for the most part are well built and well suited to present needs, but the barns or sheds are generally inadequate for sheltering the live stock in inclement weather, and periods of severe weather usually are followed by more or less loss. There is also a general lack of outbuildings for storing crops and farm machinery.

There are about 30 silos in the county, and more are being built. About 10 of these are near Abilene, 6 are located in the Bradshaw district, and the remainder are scattered through other sections. Most of the farmers, especially the dairymen, favor the use of the silo. The silage consists mainly of the grain sorghums. It is used as supplemental feed in both winter and summer for carrying stock through periods of scanty pasturage. It also is pen fed to range cattle as well as to dairy cattle.

The land for summer crops usually is prepared in January and February. Plowing usually is shallow, as unfavorable results are likely to follow deep plowing if the season should prove dry. The better practice is not to plow deeply oftener than every other year and then to deepen the furrow not more than an inch or so. Such crops as milo, kafir, feterita, and corn usually are planted in March, while cotton is planted in April, though any of these crops may be planted earlier or later, depending on weather and labor conditions. Cotton is picked in September to December, or even later. Two seed crops are sometimes obtained from the grain sorghums, but they are all harvested as a rule by August or September. Johnson grass, although not seeded, grows throughout the county and is utilized for hay and pasturage. Usually it is cut for hay in early summer and again in the fall, being pastured in midsummer. Sorghum is sometimes similarly used.

Wheat usually is seeded in October or November and harvested the following May. Oats are sometimes fall seeded also, but to a large extent this crop is sown from January to the middle of February and harvested the last of May or the first of June. In favorable seasons, when soil-moisture conditions seem to warrant such practice, the small-grain crops are followed by July plantings of millet and sorghum as catch crops, which are used for hay or pasturage.

Systematic crop rotation is not followed in the county, though on some farms there is a tendency in that direction. The following four-year rotation is suggested by the county agricultural agent. It includes crops commonly grown and is adapted to the practices gen-

erally followed in the county. (1) Cotton, the land plowed in the fall and winter, the seed planted in April, and the crop picked September to December; (2) oats, the land fall and winter plowed, the seed planted January to the middle of February, and the crop harvested the last of May or early June following; (3) intertilled crops, the land plowed or disked in fall or winter, the seed—milo, kafir, or feterita—planted in April or May, and the crop harvested in August or September; (4) wheat, the land early fall plowed and well harrowed, and the crop seeded in October or November and harvested the following May or June. The crops named in this rotation are to be grown as major annual crops, while catch crops of millet and sorghum may be used occasionally, as now, in case of failure of a major crop, and when the soil-moisture condition would seem to warrant.

Commercial fertilizers are not in general use in the county.

The 1910 census shows an expenditure of \$139,221 for labor on the 1,020 farms reporting. Farm laborers are paid about \$20 to \$25 per month with board, or \$30 to \$35 without, though in the latter case a house may be furnished. Day laborers are paid from \$1 to \$1.50 with board.

The 1910 census reports 2,404 farms in Taylor County of an average size of about 195 acres. About 81 per cent of the land area is reported in farms, and of the land in farms 43 per cent is reported improved. There are a few ranches in the county of about 1,000 to 5,000 acres. About 43 per cent of the farms are reported as operated by their owners and practically all the remainder by tenants. The farm lands are leased mainly on a share basis. Where the owner furnishes housing, work stock, and implements he receives one-half the crop. When the owner furnishes only the land he receives one-third the corn or other grains and one-fourth the cotton.

In the plateau division of the county land values range from about \$4 to \$8 an acre, while in the lower division, or "farm land" section, values range from about \$15 to \$35 an acre. The census of 1910 gives the average assessed value of farm land as \$23.87 an acre. Near Abilene, Merkel, and other towns and in locations with oil prospects speculative prices ranging from \$50 to \$60 or more an acre obtain.

SOILS.

As stated in the description of the area, Taylor County comprises remnants of a former high plateau, covering about one-fourth of its area, and a lower plain covering the remainder, except that small part occupied by the streams and their valleys. Figure 2 shows the distribution of these different physiographic divisions.

The rock strata composing the plateau remnants consist of an upper nearly horizontal layer of grayish limestone, 10 to 50 feet or more thick, composed of several layers of various degrees of hardness and purity and an underlying horizontal bed consisting of alternate layers of reddish, fine-grained sandstone, shales, and siliceous pebbly conglomerate of an aggregate thickness of many feet.

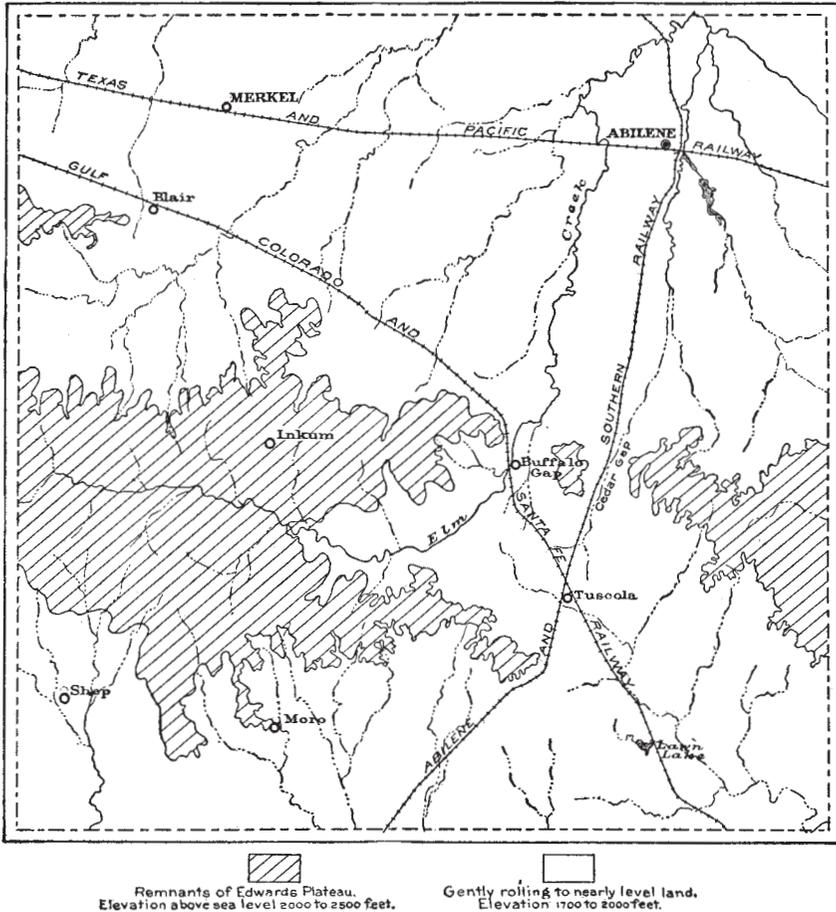


FIG. 2.—Sketch map showing topographic divisions.

The limestone probably is the Edwards formation, while the underlying material apparently correlates with the Permian Red Beds.

The agencies which have operated to remove the thick beds of rock from nearly three-fourths of the area of Taylor County are weathering, or the disintegration of exposed rock surfaces, and the removal of the residual material through erosion by running water and wind.

Not all the lower plainlike section of the county, however, shows surface exposures of the original beds, for the greater part is now

covered with deposits, 2 to 15 feet or more thick, of water-laid material, transported as outwash material from the slowly receding front of the old plateau by stream action and sheet erosion. The deposits may be considered as valley-filling material or as a stream-built terrace plain, the work of streams which probably shifted their channels from place to place. Material of this character gives rise to soils of the Miles and Abilene series.

About one-fourth of the area of the plainlike section of the county has surface exposures of the original strata, or of residual material derived from the original strata. This material forms the soils of the Brackett and Vernon series, which occur mainly in an irregular zone skirting the plateau remnants, though also in small outliers farther out in the area of transported soil material.

The plateau areas include large exposures of the original limestone and some sandstone, shale, and conglomerate, as well as residual material derived from these strata. These materials give rise to soils of the Brackett and Crawford series and to Rough stony land.

The material in the first bottoms of streams consists of recently deposited alluvium, which is being added to by each overflow. That on the second bottoms consists of older alluvium, which generally is no longer overflowed.

All the soils of the county are derived directly, as in the case of the residual soils, or indirectly, as in the case of the stream-bottom, terrace, and terrace-plain soils, from limestone, shale, sandstone, and conglomerate rocks. Of the residual soils within the terrace-plain section, those from limestone, placed in the Brackett series, are less extensive than those from sandstone, shale, and conglomerate, classed with the Vernon series. On the plateaus and their slopes the soils are almost entirely residual from limestone.

Gravel in variable quantities is associated with practically all the soils within the lower terrace-plain section, but true rounded gravel is almost entirely absent in the plateau remnants. The gravel consists of well-rounded fragments of quartz, chert, and other rocks.

In the older water-laid or terrace-plain materials the gravel occurs on the surface, in the soil, and in the subsoil. In the stream-terrace soils, such as the Bastrop, gravel is rarely present within the 3-foot section, although it occurs, at least in places, in the substratum. Practically the same condition exists in the case of the recent-alluvial soils, the Miller and Frio.

Many of the soils are calcareous in the first and second foot depths, effervescing in hydrochloric acid, while in the lower depths such reaction almost invariably is obtained. In the older outwash or terrace-plain types the subsoils frequently contain soft, whitish highly calcareous material, and in many places lime has cemented the soil

materials into hardpan layers, which often include enough gravel of quartz, chert, and limestone to form a conglomerate. In the stream-terrace and first-bottom soils the lime-cemented hardpan is not encountered, although in places there is some whitish calcareous material and small lime nodules. Often no lime is visible, though shown to be present by the acid test. The residual soils—Brackett, Crawford, and Vernon—are calcareous, the Brackett being highly so.

Owing to the relatively dry climate, the soils of Taylor County have not been subjected to as much leaching as the soils in more humid regions, and this largely accounts for the relatively high content of lime, and apparently, of other soluble mineral constituents. The soluble salt content, however, seldom is excessive, except in a few relatively small alkali spots in catchment basins.

Since the various rock strata within the area supplying the soil material are largely of fine texture, the resulting soils consist largely of fine-textured types. The fine sands and fine sandy loams and loams, clay loams, silty clay loams, and clays, represent lands which are mainly favorable for cultivation; the remainder of the county is mainly rough and stony land.

Twenty-six types of soil, exclusive of Rough stony land, are mapped in Taylor County. These types represent 9 soil series, the Crawford, Brackett, Vernon, Miles, Abilene, Bastrop, Simmons, Miller, and Frio.

The Crawford series includes soils of reddish-brown to dark-brown color, underlain by dull-red to deep-red, rather stiff, compact clay. The substratum in places is clay, but is mainly limestone. This series is of residual origin, being derived from limestone, and is more or less calcareous. The topography is level to gently rolling. The Crawford series is represented in this county by a single type, the silty clay loam.

The types included in the Brackett series have whitish to brownish-gray surface soils and gray to pinkish-gray subsoils. The subsoil grades into whitish chalky material, which in turn is underlain by limestone at depths of 2 to 3 feet or more. These soils are residual from limestone and are highly calcareous. They occupy fairly steep slopes and level or gently rolling areas. The series is represented in Taylor County by four types—the stony loam, gravelly loam, fine sandy loam, and loam.

The surface soils of the types included in the Vernon series are chocolate-red to chocolate-brown in color, and are underlain by a red to deep-pinkish or Indian-red clay subsoil. The subsoil in places contains thin layers of limy material or lime nodules, the material as a whole being rather strongly calcareous in the lower subsoil. The

soils of this series are residual from sandstone, shale, and pebbly conglomerate of the Permian Red Beds formation. They occupy steep eroded slopes and moderately sloping to gently rolling lands. The Vernon gravelly clay loam, fine sandy loam, and clay are mapped in this county.

The Miles series includes chocolate-brown or reddish-brown soils with reddish-brown to pinkish compact clay subsoils, frequently containing gravel and powdery or hardened lime in the lower part. In places the surface material contains some quartz, chert, and other gravel. Gravel is frequently present in the lower subsoil and substratum; here it is bedded in the clay as a clay-gravel hardpan or cemented with lime into a conglomerate hardpan. The latter is seldom more than 4 to 8 inches thick, and occurs usually within the second or third foot. The substratum consists mainly of reddish clay, carrying variable quantities of gravel. The series owes its origin to weathering of the waterlaid or outwash-plain material. The topography varies from level to gently undulating. The series includes four types—the gravelly clay loam, fine sandy loam, loam, and silty clay loam.

The surface material of the soils included in the Abilene series ranges from dark reddish brown or chocolate brown to almost black. The subsoil ranges from reddish brown to chocolate brown and consists of compact clay, carrying varying quantities of small gravel and white powdery or hardened lime in the lower part or in the substratum. In places gravel of quartz, chert, and other rocks is present on the surface. Beds of clay, gravel, cemented calcareous hardpan, or limestone conglomerate occur. Soils of the Abilene series are derived from waterlaid, outwash-plain materials. The topography varies from level to gently undulating. The Abilene loam and silty clay loam are mapped in this county.

The surface soils of the Bastrop series are reddish brown and are underlain by dark chocolate red to pale reddish brown clay, the depth of color depending on the quantity of light-colored calcareous material present. In places white streaks of limy material occur in the lower subsoil. Lime is also present in the form of small nodules or concretions. In general the subsoil material effervesces strongly with hydrochloric acid. A few quartz, chert, and other gravel particles occur within the 3-foot section, and larger amounts occur in the substratum, which in places at lower depths is composed of beds of gravel. The material from which these soils are derived consists of old alluvium, and was deposited when the overflows reached higher levels than at present. The surface is level or very gently undulating. Four members of the Bastrop series are mapped—the fine sand, fine sandy loam, loam, and silty clay loam.

The Simmons series includes types with very dark brown to black soils and dark-drab or brownish-drab to black clay subsoils. The subsoil is generally calcareous, compact when dry, and very sticky when wet. In places scattered quartz and chert gravel occurs within the 3-foot section, but the lime-cemented gravel beds found in the soils of the Abilene and Miles series do not occur, as a rule, within the 3-foot section, though they may be present in the substratum. The soils of this series are derived from outwash plains deposits. In general, the surface is level and the drainage imperfect. In places the surface is hummocky or hog-wallowy, the soil of the hummocks being brownish and that of the depressions black, so that plowed fields have a spotted appearance. In this county the Simmons series is represented by two types—the fine sandy loam and clay.

The types included in the Miller series have reddish-brown to chocolate-brown soils, and a chocolate-red clay subsoil. The substratum usually consists of clayey material similar to the subsoil, interbedded with strata of gravel. The lower subsoil in places is calcareous, but less so than the subsoil of the Bastrop and Simmons series. The Miller soils are derived from recent alluvium containing considerable wash from the Permian Red Beds. The surface varies from level to billowy. The series in Taylor County includes four types—the Miller fine sandy loam, loam, silty clay loam, and clay.

The types included in the Frio series have dark-brown to black soils, and a compact to moderately friable, dark-drab to brownish or grayish clay subsoil. Stratified gravel is present in the deep substratum, at least in some places, but gravel is seldom encountered within the 3-foot section. The lower subsoil in places is calcareous. The material giving rise to the Frio series apparently includes wash from all the upland soils of the region, except the Vernon. At least there is not enough Vernon material present to impart a reddish color. The Frio soils occur in the first bottoms of streams, and are subject to overflow. The surface varies from flat to billowy. The series in Taylor County is represented by two types, the loam and clay.

Rough stony land includes steep, stony areas, mainly the scarps of the plateau remnants, consisting chiefly of exposures of fragments of limestone, sandstone, shale, and conglomerate.

The following table gives the name and actual and relative extent of each soil type mapped in Taylor County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Abilene silty clay loam.....	54,464	12.9	Miller silty clay loam.....	17,600	3.0
Deep phase.....	20,608		Vernon fine sandy loam.....	16,512	2.8
Brackett stony loam.....	68,032	11.7	Vernon clay.....	15,360	2.6
Bastrop silty clay loam.....	33,984	7.3	Brackett loam.....	12,864	2.2
Heavy phase.....	8,448		Miles fine sandy loam.....	11,712	2.0
Rough stony land.....	32,064	5.5	Frio loam.....	11,456	2.0
Simmons clay.....	29,952	5.2	Crawford silty clay loam.....	8,576	1.5
Abilene loam.....	18,112	5.0	Frio clay.....	6,784	1.2
Deep phase.....	10,944		Brackett fine sandy loam.....	5,696	1.0
Miles loam.....	28,352	4.9	Miller fine sandy loam.....	3,008	.9
Miles silty clay loam.....	26,048	4.5	Light phase.....	2,112	
Vernon gravelly clay loam.....	23,616	4.1	Miller loam.....	4,864	.8
Bastrop fine sandy loam.....	22,720	3.9	Simmons fine sandy loam.....	1,920	.3
Brackett gravelly loam.....	22,400	3.9	Bastrop fine sand.....	896	.2
Miles gravelly clay loam.....	21,696	3.7			
Bastrop loam.....	21,568	3.7			
Miller clay.....	18,752	3.2	Total.....	581,120

CRAWFORD SILTY CLAY LOAM.

The Crawford silty clay loam in its typical development in this county consists of a reddish-brown to chocolate-brown friable silty clay loam, underlain at a depth of 5 to 8 inches by a dull-red or chocolate-red clay which becomes quite stiff in the lower part of the 3-foot section. Included patches too small to map separately have a dark-brown to black surface soil and a dark-brown subsoil with only a slight reddish tinge. The substratum consists of massive limestone, which is encountered at a depth of about 2 to 3 feet or more. Between the subsoil and massive limestone there is usually a layer of several inches of friable chalky material. The material is residual from limestone, and is increasingly calcareous with depth.

The Crawford silty clay loam occurs on the top of the plateau remnants of the county, as gentle slopes, and in flat to gently rolling areas. The natural drainage is generally good.

This type, though not very extensive as compared with other soils, is quite important in the agriculture of the county. It lies in the section where the soils for the most part are stony and better suited to grazing than to crop production, and includes the greater part of the tillable land of the high plateaus. The type therefore is especially important in the production of stock feed.

The principal crops grown are cotton, the grain sorghums, such as milo, kafir, and feterita, and corn, oats, and wheat. Corn is considered a more certain crop on these high plateau lands than on the soils of the lower eroded plain section of the county, the hot winds

of May and June apparently being less injurious at the higher elevations. Wheat and other small grains also are said to produce better on this soil.

Cattle seem to lead in the live-stock industries, though horses, mules, sheep, goats, and hogs are produced. The dairy products are mainly used at home. The cattle and other live stock are raised on the native pasturage, supplemented with forage crops fed in pens. The animals are sold at maturity, being shipped as a rule in carload lots from several local shipping points. Live stock, cotton, and wheat are the principal market products for the type.

According to estimates of farmers, the yields of cotton range from about one-fifth to three-fourths bale per acre, the returns depending largely on the season. Corn yields from about 5 to 25 bushels, grain sorghums 10 to 30 bushels, wheat 5 to 20 bushels, and oats about 10 to 30 bushels per acre.

Much of the work of preparing the land for summer crops is done in the winter months, especially in February. Corn and the grain sorghums are planted in March and cotton for the most part in April, though planting may take place earlier or later, being dependent on weather or labor conditions. Wheat and oats usually are seeded in October, though sometimes oats are sown in February or March. The preparation of the seed bed in most cases consists of preliminary shallow plowing or disking, with such subsequent harrowing as may be deemed necessary. Commercial fertilizers are not used. A green crop of some kind is plowed under occasionally to increase the supply of organic matter.

This type is valued at about \$15 to \$25 an acre. By reason of its association in many places with lower priced stony land, the price of a given tract varies in accordance with the proportion of the Crawford silty clay loam to that of the stony land sold with it.

Owing to the rather frequent low yields of cotton, due to the boll weevil and other pests and to the uncertain rainfall, this crop is apparently less desirable on this land than the forage crops. The large areas of stony land surrounding the type afford pasturage, and if grazing is supplemented by pen feeding the live-stock industry could doubtless be extended with profit. The grain sorghums, milo, kafir, and feterita, and Sudan grass and Johnson grass, all seem to withstand the dry conditions as well as, if not better than, cotton. They are comparatively free from insects and other pests, and if grown in support of the live-stock industry would no doubt give greater returns than cotton.

This type includes a number of stony areas which are indicated on the soil map by stone symbols. These differ from the main type in that the bedrock is encountered at much less depth than in typical

areas, usually at 5 to 36 inches, and slabs of limestone are scattered over the surface.

Although of a dry, stony nature, these areas are not without considerable importance in that they afford valuable grazing. Large areas of this stony land are without tree growth, except for a scattering of live oak, mesquite, cedar, and shin oak. In the spring, except when the season is very dry, weeds and grass make a dense growth, affording excellent pasturage. In summer the grass cures on the root and affords grazing the remainder of the year, except where overgrazed or when dry seasons prevent. In places there is quite a dense growth of live oak, mesquite, shin oak, and various thorny bushes, cactus, dagger grass, etc.; but there is also more or less undergrowth of weeds and grass, while leaves and acorns from the trees and brush afford some additional food.

These areas are used chiefly for grazing cattle. Such land is valued at about \$4 to \$8 an acre, depending on location, available water supply, character of the pasturage, and available sources of forage.

BRACKETT STONY LOAM.

The surface material of the Brackett stony loam consists of a brownish to dark-gray loam to silty clay loam, grading into whitish, calcareous material, and underlain at depths varying from about 2 to 20 inches by limestone. In most places angular fragments of limestone and chert are very abundant, and there are occasional exposures of limestone. There are also some small included areas of shallow silty clay loam comparatively free from stones. In places the texture is that of a clay, and the material is grayish and dries out to an ashy color.

This type is found on the tops of the plateau remnants occurring as gentle slopes and relatively flat to gently rolling areas. The natural drainage is good to excessive.

Characteristically this land supports a scattered growth of cedar, live oak, mesquite, and shin oak. It affords good pasturage in favorable seasons, and is largely used for raising cattle. It is not used for cultivated crops.

Land values range from about \$4 to \$8 an acre, depending on such local conditions as available water supply, amount and quality of native pasturage, and available sources of field-grown stock feed.

BRACKETT GRAVELLY LOAM.

The Brackett gravelly loam consists of brownish to light-gray loam, silty clay loam or clay, underlain at about 3 to 10 inches by whitish, chalky material consisting of soft, partially decomposed limestone. In places yellowish clay is present in the subsoil. Small and moderately large angular fragments of limestone and chert are

abundant over the surface and are present throughout the soil section. In places rounded chert, quartz, and other gravel and cobbles and fragments of hardpan conglomerate are plentiful. Bedrock of limestone or a mass of rock fragments frequently is reached within the 3-foot section. Limestone exposures, as well as large limestone fragments, are of common occurrence. In some places considerable reddish material is present.

The type is found in considerable extent at or near the base of the Rough stony land escarpments. Other areas, some of them quite large, occur farther from the base of the scarp, mainly in the eastern part of the county. This type, in common with the other soils of this series, lies largely within the lower eroded plain country. The surface in places is very rough and eroded over the greater part. However, the areas consist of fairly steep slopes to slopes of easy gradient that merge with the plainlike country. The natural drainage is good and in some cases excessive.

Nearly all this type is used for grazing, to which purpose it seems as well adapted as any soil in the county. A mixed livestock industry has developed on this soil. The stock consists largely of cattle, but some horses, mules, sheep, goats, and hogs are produced, and dairying is carried on to some extent. Increasing interest is being taken in the raising of hogs. The pasturage includes the various weeds and grasses common to the region, the leaves of live oak, mesquite and other brush growths, the pods of the mesquite, and the acorns of the live oak, of which the last two constitute important feed for fall and winter. This pasturage is supplemented by feeding forage crops produced on adjoining soils more favorable for cultivation. This type ranges in price from \$4 to \$8 an acre.

BRACKETT FINE SANDY LOAM.

The Brackett fine sandy loam consists of grayish-brown fine sandy loam, underlain at a depth of 8 to 12 inches by gray to yellowish-gray, calcareous clay of fairly compact structure. The surface material varies from rather loose fine sand to rather compact fine sandy loam. The subsoil in places is somewhat sandy, and in places it has a pinkish hue. The surface material includes small limestone fragments, and quartz, chert, and other gravel. The substratum consists of massive limestone and soft, or "rotten," limestone, which is encountered at depths of 1 to 2 feet or more.

This type occurs almost exclusively at or near the base of the Rough stony land escarpments of the plateau areas. It occupies fairly steep to long, gentle slopes. The areas are never very large, and the aggregate area of the type is relatively small. The natural drainage is generally good, but few areas are excessively drained.

Possibly one-half or more of the type is in cultivation, the remainder being largely in pasture. Much of the land is covered with cat-claw, cedar, and shin oak, and grasses. The principal crops are cotton and the grain sorghums, with some corn and small patches of garden crops.

This soil warms up earlier in the spring than do the heavier textured types, and crops mature somewhat more quickly, though owing to the character of the crops grown at present this feature is of no particular importance. The type withstands drought better than the heavier soils.

The crop yields on the Brackett fine sandy loam are approximately one-fifth to three-fourths bale of cotton and 10 to 30 bushels of sorghum grain per acre. The minor crops produce correspondingly variable yields, the returns depending largely on the amount of rainfall.

The land for summer crops is prepared usually in February, or earlier in the winter, and corn and grain sorghums are planted in March. Cotton, as a rule, is planted in April. Wheat and oats usually are seeded in October, though sometimes oats are sown in February or March. The preparation of the seed bed in most cases consists of shallow plowing or disking, followed by harrowing. Commercial fertilizers are not used, but a green crop is plowed under occasionally to supply organic matter, in which the type is usually deficient.

In sections in which the Brackett fine sandy loam occurs land values range from about \$15 to \$35 an acre.

Under present conditions of low average yields of cotton it would seem better to grow grain sorghums, such as milo, kafir, and feterita, and grasses such as Sudan grass and Johnson grass, in connection with stock raising. Elsewhere under almost identical climatic and soil conditions, peanuts and artichokes are grown and utilized as hog pasture.

BRACKETT LOAM.

The Brackett loam consists of a grayish-brown to dark ashy gray loam, underlain at about 6 to 8 inches by grayish to yellowish brown clay, which, in turn, passes into grayish-yellow or whitish, chalky, highly calcareous material. The surface material in places is somewhat sandy, being influenced by colluvial wash from sandy types, and in places it includes an admixture of small limestone fragments and quartz, chert, and other pebbles.

Some small areas of silty clay loam, rather darker in color on the whole than the typical Brackett loam, are included with the type because of their small extent. This silty clay is somewhat more difficult to cultivate under extreme wet or dry conditions than the loam,

but in the main the same classes of crops are grown with about the same results.

The Brackett loam occurs almost exclusively at or near the base of the Rough stony land escarpments. The surface varies from gently sloping to nearly level. The total area of the type is not large. The natural drainage is ordinarily good, and in dry seasons may be excessive.

Possibly one-half or more of this type is in cultivation, the remainder being largely included in pastures, used mainly for cattle. The principal crops are cotton, the grain sorghums, and hay or forage crops, such as Johnson grass and sorghum. Relatively small quantities of wheat, oats, corn, and garden crops are grown, mainly for home and local use. The pasture plants are those mentioned for other types of the series.

Owing to its rather light, friable structure, the greater part of the type is easy to work. The soil warms up earlier than the heavier textured soils, and crops mature earlier. Crop yields are about the same as those obtained on the Brackett fine sandy loam, and the land is handled in about the same way. The Brackett loam is valued at about \$15 to \$35 an acre.

Under present conditions the best use of this type apparently is for the protection of grain sorghums, for use largely in support of the live-stock industry, and for growing garden crops and small grains for home use.

VERNON GRAVELLY CLAY LOAM.

The Vernon gravelly clay loam consists of chocolate-red clay loam, underlain at 5 or 6 inches by deeper chocolate red clay of a stiffer nature, with some whitish, powdery, limy layers and lime nodules in the subsoil. Rounded chert and quartz gravel, and angular fragments of red shale and sandstone are thickly scattered over the surface, and to a less extent through the soil. The more stony areas are indicated on the map by stone symbols. Bedrock of the parent shale, sandstone, and conglomerate is present within the 3-foot section in places. There are some included patches of the Vernon gravelly clay. Some areas are quite stony, large fragments of sandstone and sandstone conglomerate being present.

This type adjoins the base of the plateaus and occurs also as detached areas throughout the terrace-plain section. It occupies steep slopes, low ridges, and some rather large level areas. The aggregate area is fairly large, constituting 4.1 per cent of the area of the county, and the type is important in the agriculture of the county. The natural drainage is good, the run-off being so rapid as to cause erosion in places, and a part of the type is marked by deep gullies on some of the slopes.

Practically all this soil is used for pasture, and the land is now carrying about as many animals as it will safely support. The stock consists mainly of beef cattle, with a few dairy cows, some horses, mules, sheep, goats, and hogs. Increased interest is being taken in hog raising. The Vernon gravelly clay loam ranges in value from about \$4 to \$8 an acre.

VERNON FINE SANDY LOAM.

The Vernon fine sandy loam consists of reddish-brown to brownish fine sandy loam, 8 to 20 inches deep, underlain by red or chocolate-red, rather compact fine sandy clay to stiff clay. There are some included areas of loamy fine sand and also eroded spots of clay loam. In places small, angular fragments of limestone and chert, and occasionally rounded gravel, are present. Some outcrops of sandstone occur; these are shown on the soil map by symbol. Bedrock of sandstone, shale, and conglomerate is encountered at depths of 2 to 3 feet or more. The type is calcareous in the lower part, the limy material showing in places as white streaks and as small concretions.

Under normal moisture conditions this type is loose and friable when cultivated. The soil is inclined to become compact in uncultivated areas, resembling in this respect a heavier soil. There are some included patches of loam or silt loam.

The Vernon fine sandy loam occurs along the base of the plateaus. It occupies slight knolls, ridges, and slopes, though there are some fairly flat areas. The areas are not large, and the total area of the type is relatively small. The natural drainage is good.

Possibly one-half or more of the area of Vernon fine sandy loam is in cultivation, the remainder being used as pasture or not conveniently located for cultivation. Uncleared areas support a growth of catclaw, prickly pear, scrub oak, and various grasses and weeds. The principal crops are cotton, grain sorghums, and some corn. The type withstands drought better than the heavier soils. Cotton yields from about one-fifth to three-fourths bale and the grain sorghums from 10 to 30 bushels per acre.

Preparation of the land and seeding of crops on this type do not differ from the practice on the soils already described. The type is generally deficient in organic matter. The Vernon fine sandy loam is valued at about \$15 to \$35 an acre.

The growing of grain sorghums and grasses such as Sudan grass and Johnson grass, for use as supplementary feed for stock, is profitable.

VERNON CLAY.

The Vernon clay consists of a chocolate-red or reddish-brown clay about 5 to 10 inches deep, underlain by chocolate-red clay of rather compact structure. When dry the surface usually is compact and

hard, and when wet the soil is sticky, though under normal moisture conditions the cultivated soil is rather mellow. Some areas included in the type have a heavy clay texture, and others are more friable and silty than the typical soil. In places small, angular fragments of limestone and chert are abundant on the surface, and some gravel is present, though seldom in sufficient quantity to interfere with cultivation. The lower subsoil is calcareous.

This type occurs near the base of the plateaus, occupying slight knolls, ridges, and slopes. The drainage is well established.

About one-third of the Vernon clay is in cultivation. The principal crops are cotton, milo, kafir, feterita, and Johnson grass. Some wheat, oats, and corn also are grown. Cotton yields from less than one-fifth to three-fourths bale, grain sorghums from 5 to 30 bushels, and Johnson grass from 1 ton to 3 tons per acre. Wheat and oats, which are of minor importance, yield from 5 to 25 bushels per acre. The variation in yields is due mainly to varying conditions of rainfall, the soil being naturally strong and productive. Much of the land is used as natural pasture. The Vernon clay is valued at about \$15 to \$35 an acre.

The type seems quite well adapted to all the crops commonly grown, but under present conditions can probably be most profitably used in growing the forage crops. Owing to its heavy character, the soil requires deeper plowing and more thorough cultivation than the lighter textured soils. The depth of plowing should be increased gradually, however, and probably in the end should not exceed 6 or 8 inches.

MILES GRAVELLY CLAY LOAM.

The Miles gravelly clay loam consists of a reddish-brown gravelly clay loam 6 to 10 inches deep, overlying reddish-brown to pinkish, gravelly, stiff clay. Gravel claypan or a calcareous conglomerate usually is reached at about 20 to 30 inches. The soil contains in places such large accumulations of quartz, chert, and other noncalcareous gravel that cultivation is impracticable, while in other places little gravel occurs.

Some small included areas consist of gravelly loam about 2 to 10 inches deep, underlain by red to pinkish, compact gravelly clay, or limestone conglomerate hardpan. In places the lime-cemented material is exposed at the surface. The greater part of this gravelly loam is not well suited to cultivation, but is better adapted to grazing.

The Miles gravelly clay loam is encountered in scattered areas within the terrace-plain portion of the county. It includes steep slopes, low knolls, and ridges, with occasional areas of relatively flat to gently sloping surface. The natural drainage is generally good, and in some places rather excessive.

This type is of relatively small extent. Only about 10 per cent of its area is in cultivation. Cotton, grain sorghums, and Johnson grass are the principal crops.

Nearly all the uncultivated area is used for pasture, but owing to the small extent of the type it contributes little to the support of the live-stock industry.

The conditions on this type are comparable with those on the Miles fine sandy loam, except of course, that the gravelly clay loam is in general more difficult to cultivate. Where well handled the crop yields compare favorably with those on the other Miles soils.

MILES FINE SANDY LOAM.

The soil of the Miles fine sandy loam consists of reddish-brown fine sandy loam or loamy fine sand about 8 to 20 inches deep, underlain by reddish-brown to pinkish, compact fine sandy clay to clay, with frequently considerable included gravel and white, powdery to compact lime layers in the lower subsoil. Some quartz, chert, and small limestone fragments are present in the surface soil of some areas. In the subsoil or substratum gravel is frequently present as a hardpan or heavier material, forming the common "concrete" beds. It is also present in places in a layer of tough clay. The lime-cemented hardpan is seldom more than 4 to 8 inches thick and occurs usually at 2 or 3 feet below the surface.

This type is mapped in scattered areas in the lower plain section of the county, where it forms low knolls and ridges and relatively flat to gently sloping areas. The natural drainage is adequate and for the most part is not excessive.

Though inextensive, this type is relatively important and a desirable agricultural soil. Like the other sandy soils, it is better able to withstand drought than the heavy-textured soils and therefore to be valued highly under existing climatic conditions. Probably two-thirds of the type is in cultivation. Cotton, grain sorghum, and Johnson grass are the chief crops, with relatively small acreages in wheat and oats. The production of live stock, including cattle, horses, mules, some dairy cows, sheep, goats, and hogs, is important on this soil. Increasing attention is being given to hog raising. This soil warms up earlier in the spring than do the heavier soils, and crops mature somewhat quicker. Cotton yields from about one-fifth to three-fourths bale per acre and the grain sorghums about 10 to 30 bushels.

The methods of seed-bed preparation and of cultivation commonly followed in the county are practiced on this soil. The type seems for the most part to be deficient in organic matter. In some exposed areas the surface material drifts. This condition could be alleviated

by incorporating organic matter. The Miles fine sandy loam is valued at about \$15 to \$35 an acre.

Suggestions for handling this soil would not differ essentially from those made in connection with the types already described.

MILES LOAM.

The Miles loam consists of a reddish-brown, rather mellow loam, 6 to 10 inches deep, underlain by reddish-brown to pinkish, compact clay which becomes stiffer with increasing depth. Like the other Miles soils, this type in many places contains lime conglomerate hardpan in the subsoil. In some areas a gravel claypan is present. A whitish chalky material is also encountered in the subsoil.

The Miles loam is found in some fairly large areas scattered through the terrace-plain portion of the county. It occupies low ridges and relatively flat to gently rolling country. The natural drainage is good and for the most part not excessive.

The type has some of the desirable features of the lighter textured soils; it withstands drought well and is easy to cultivate. Possibly three-fourths of it is under cultivation, the remainder being mainly in pasture. The common crops of the county are grown. Cotton, according to local estimates, yields about one-fifth to three-fourths bale per acre, and the grain sorghums about 10 to 30 bushels of grain. Beef cattle are important, and some horses, mules, sheep, goats, and hogs are raised. A few dairy cows are kept.

Land values, methods of handling the soil, and possibilities for improvement on this type are about the same as on the Brackett fine sandy loam.

MILES SILTY CLAY LOAM.

The Miles silty clay loam consists of reddish-brown, compact silty clay loam, underlain at an average depth of about 6 inches by brownish-red or reddish-brown to pinkish, stiff clay. At about 24 inches a whitish lime hardpan, or mortar-bed layer, containing gravel in places, or a reddish gravel claypan and whitish chalky material is encountered. As mapped, the type includes patches of both the Miles clay and clay loam.

The type is quite extensively distributed throughout the terrace-plain section of the county. The surface is for the most part level to gently undulating. The natural drainage is adequate, but seldom excessive.

This type is one of the most extensive members of the series, and has an important place in the agriculture of the county. Probably one-third or more of it is in cultivation, the remainder being largely used for grazing. The common staple crops, cotton, milo, kafir, feterita, and Johnson grass are grown, with some wheat and oats.

Cattle, hogs, sheep and goats, horses, and mules are raised, ranking in importance in the order named. There are relatively few dairy cows on the type, though increased interest is being shown in dairying. In some seasons a second growth of grain sorghum and a second crop of Johnson grass are harvested in the fall. Johnson grass is sometimes used for midsummer pasturage, in which case a second cutting of hay is not ordinarily obtained. According to statements of farmers, the yield of cotton ranges from about one-fifth to three-fourths bale per acre, depending mainly on the rainfall. The grain sorghums yield from 10 to 30 bushels, wheat 5 to 20 bushels, and oats about 10 to 30 bushels per acre. Much of the work of preparing the land for summer crops is done during the winter months, especially in February. The soil compacts after heavy rains and the maintenance of a good supply of organic matter is necessary to keep the soil in good tilth. The plowing should be gradually increased to a depth of only 6 or 8 inches, the deeper plowing suitable for more humid regions being inadvisable here.

The Miles silty clay loam is valued at \$20 to \$35 an acre.

ABILENE LOAM.

The Abilene loam consists of dark reddish brown to dark-brown or chocolate-brown, friable loam, underlain at about 6 to 8 inches by dark reddish brown to chocolate-brown clay, which passes below into slightly reddish to dark yellowish brown or chocolate-brown, tough clay. At about 24 to 36 inches hardpan or whitish chalky material is encountered. The hardpan is of two kinds; a limestone conglomerate and a claypan frequently containing gravel. Included in the type as mapped are some small areas in which the lime hardpan lies near the surface or is exposed.

This type is found in scattered areas in the lower or terrace-plain part of the county. The surface is flat to gently undulating or gently sloping. The natural drainage is good.

About one-half the type is in cultivation, and the remainder mainly in pasture. Cotton, milo, kafir, feterita, and Johnson grass are the principal crops, and some wheat and oats are grown. Cattle, hogs, sheep and goats, horses, and mules constitute the greater part of the live stock, ranking in importance in the order named. Live stock of various kinds is produced. Increased interest is being shown in dairying and in the raising of poultry and hogs.

According to statements of farmers, the yields of cotton range from about one-fifth to three-fourths bale per acre. The grain sorghums yield about 10 to 30 bushels, wheat 5 to 20 bushels, oats 10 to 30 bushels, and Johnson grass from about 1 ton to 3 tons of hay per acre.

The Abilene loam is valued at \$20 to \$35 an acre.

This type, although loamy, becomes rather compact after heavy rains. A good organic-matter content would make the material mellow and more absorptive of water. The plowing under of green vegetation is a good method of supplying organic matter. Better results would likely follow an increase in the depth of plowing. Increased production of live stock, especially beef cattle and hogs, should prove profitable.

Abilene loam, deep phase.—A deep phase of the Abilene loam is separated on the soil map. This phase differs from the typical only in that the lime-cemented hardpan is not reached within the 3-foot section.

ABILENE SILTY CLAY LOAM.

The Abilene silty clay loam consists of dark reddish brown to dark-brown silty clay loam, underlain at about 6 to 10 inches by dark reddish brown to brown clay, which passes into dark yellowish brown or chocolate-brown, tough clay. The lime hardpan or gravel claypan of the series is usually reached at about 24 inches. In some places only the whitish chalky material is encountered within the 3-foot section. In places gravel of quartz, chert, and other rocks is present on the surface, but not in quantities sufficient to interfere with cultivation.

The Abilene silty clay loam is quite extensively distributed throughout the plainlike, lower part of the county. The surface is flat or undulating to gently sloping. The natural drainage is for the most part adequate, though seldom excessive.

This is the most extensive type of the Abilene series, and with its deep phase the most extensive soil in the county. Because of its heavy texture it is more or less subject to drought, but injury from this cause can be materially reduced by proper cultivation. The type is valuable for the production of the staple crops, especially the valuable forage and feed crops. Possibly one-third or more of the type is in cultivation, and most of the remainder is used for pasture.

Cotton, milo, kafir, feterita, Johnson grass, and sorghum cane are the principal crops. Some wheat and oats also are grown. According to estimates of farmers, the yield of cotton ranges from about one-fifth to three-fourths bale per acre. The grain sorghums yield about 10 to 30 bushels, wheat 5 to 20 bushels, and oats 10 to 30 bushels, while the yield of Johnson grass ranges from about 1 to 3 tons per acre. Crop yields vary according to the rainfall. This type is valued at about \$20 to \$35 an acre.

It would seem advisable on this soil to grow more of the drought-resistant stock-food crops, such as milo, kafir, feterita, Sudan grass,

sorghum cane, and, where it is already on the land, Johnson grass, in conjunction with an increased production of live stock, particularly beef cattle and hogs. The soil is inclined to compact, and to ameliorate this condition deeper fall or early winter plowing and the addition of organic matter should be resorted to. In adding organic matter plowing under green vegetation or well-rotted manure has been found more satisfactory than the addition of coarse dry litter.

Abilene silty clay loam, deep phase.—A deep phase of the Abilene silty clay loam is shown on the soil map. The phase differs from the main type only in that hardpan material does not occur within the 3-foot section.

BASTROP FINE SAND.

The Bastrop fine sand consists of pale yellowish brown to light reddish brown, loose fine sand 10 to 15 inches deep, underlain by yellowish to reddish, loose fine sand. Some included areas show a fine sandy clay in the lower part of the 3-foot section. In the vicinity of Abilene there are some areas having a mottled red and yellow, stiff, plastic subsoil which, if they had been large enough, would have been mapped as the Shawnee fine sandy loam. A few scattered quartz and chert gravel particles occur in the 3-foot section, and bedded gravel is encountered in places in the substratum.

The Bastrop fine sand occurs in a few scattered areas of relatively small total extent on the old stream terraces. The surface varies from hummocky to nearly level. The natural drainage is thorough, though for the most part not excessive.

Though of small extent, this type is of importance in the production of peaches and vegetables, especially near Abilene. In other localities it is used for the production of cotton, corn, grain sorghums, and other crops commonly grown in the county.

The Bastrop fine sand is retentive of moisture. Some trouble is caused by drifting, which at times makes replanting necessary. This tendency to drift can be combated by applying well-rotted manure or by plowing under green cover crops. This would also increase the productiveness of the type, by supplying a constituent in which it is at present deficient.

The Bastrop fine sand is valued at about \$20 to \$35 an acre. Part of the type is held at higher prices because of its location near Abilene and its adaptation to special crops.

BASTROP FINE SANDY LOAM.

The Bastrop fine sandy loam consists of brown to reddish-brown loamy fine sand or fine sandy loam, passing at 6 to 10 inches into deeper reddish fine sandy loam, which is underlain at about 15 to 24

inches by a moderately friable, chocolate-red sandy clay, becoming stiffer with increase in depth. In places the chocolate-red clay is reached at 5 to 8 inches. Small gravel particles of flint and quartz are present in the subsoil in some places.

This type is widely distributed over the stream terraces of the county. The surface is level to gently undulating. The natural drainage is adequate and seldom excessive.

The Bastrop fine sandy loam is one of the desirable soils of the county. Owing to its naturally friable structure it is easily cultivated, and by reason of its ability to absorb and conserve water crops seldom suffer from drought. Probably one-half or more of the type is in cultivation, and the remainder mainly in pasture. Cotton, milo, kafir, feterita, Johnson grass, sorghum cane, wheat, oats, and corn are the important crops. In places, as near Abilene and Merkel, vegetables are grown for local markets. The live stock consists chiefly of beef cattle, with some hogs, sheep, goats, horses, and mules. Poultry and hogs are receiving increasing attention.

Cotton produces from one-fifth to three-fourths bale per acre; the grain sorghums yield about 10 to 30 bushels, wheat 5 to 20 bushels, oats 10 to 30 bushels, and Johnson grass 1 to 3 tons of hay per acre, the yields of all crops depending mainly on the amount and distribution of the rainfall. As a whole, yields are somewhat more certain and larger than on the heavier textured types.

Land of this type is ordinarily valued at \$20 to \$35 an acre. Some of the type, because of location near towns, is held at higher prices.

The extension of the acreage devoted to forage crops in connection with the production of beef cattle and hogs would seem desirable. Peanuts, which do well on land of this kind, might be added to the present list of crops where hogs are raised. The soil is in need of vegetable matter such as can be supplied easily by plowing under green vegetation or adding well-rotted barnyard or stable manures.

BASTROP LOAM.

The Bastrop loam consists of a reddish-brown or chocolate-brown, mellow loam 6 to 10 inches deep, overlying chocolate-brown or dark reddish brown clay, which grades into brownish-red clay containing, frequently, some whitish chalky lime. In places there is some quartz and chert gravel on the surface and disseminated through the soil mass. In the deep substratum bedded gravel is of common occurrence.

This type occurs in several bodies on the old stream terraces, and in the aggregate the area is sufficient to have an important bearing upon the agriculture of the county. The surface varies from level to gently

undulating. The drainage is adequate and for the most part not excessive.

Cotton and the grain sorghums commonly grown in the county are the principal crops. Johnson grass, sorghum cane, oats, and corn also are grown. Beef cattle and hogs are important.

The soil is easy to work and to keep in a good condition of tith. It gives good yields of the crops grown. In general it is handled in the same manner and has about the same value as the Bastrop fine sandy loam.

BASTROP SILTY CLAY LOAM.

The Bastrop silty clay loam consists of reddish-brown or chocolate-colored silty clay loam, underlain at 6 to 8 inches by chocolate-red to chocolate-colored clay, which is rather stiff in the lower depths. In places whitish, chalky lime is present in the subsoil.

The type, which is extensive enough to have an important influence on the agriculture of the county, occurs in both large and small areas on the stream terraces. The surface varies from level to gently undulating, and the drainage is adequate though seldom excessive.

The Bastrop silty clay loam is the dominant type of the series. Probably one-third or more of it is in cultivation, the remainder being used mainly for grazing. Cotton, milo, kafir, feterita, Johnson grass, and sorghum for forage are the principal crops. Wheat, oats, and corn are of minor importance. The raising of beef cattle and hogs is important. The yield of cotton ranges from one-fifth to three-fourths bale per acre. The grain sorghums yield about 10 to 30 bushels, wheat 5 to 20 bushels, oats about 10 to 30 bushels, and Johnson grass from 1 to 3 tons per acre. The yields of garden crops are uncertain and variable, owing to the susceptibility of the type to drought.

The land is handled in about the same manner as the other soils of the county, being plowed in the winter as a rule and harrowed before seeding.

The Bastrop silty clay loam is valued at about \$20 to \$35 an acre.

The growing of more forage crops in order to increase the production of beef cattle and hogs should prove profitable on this type. It is advisable to plow under green vegetation or well-rotted manure occasionally to maintain an organic-matter supply sufficient to give the soil a mellow structure favorable to the retention of moisture.

Bastrop silty clay loam, heavy phase.—The Bastrop silty clay loam, heavy phase, differs slightly from the main type. The soil is heavier than the typical, consisting mainly of a clay. It is not so easy to handle as the silty clay loam, but is used for about the same purposes and has about the same agricultural value. The phase occurs in small areas associated with the typical areas.

SIMMONS FINE SANDY LOAM.

The Simmons fine sandy loam consists of dark-brown to dark-gray, friable fine sandy loam 6 to 10 inches deep, underlain by dark-drab or dark-brown, stiff clay. In the poorer drained situations the subsoil is bluish. After heavy rains, or in the absence of cultivation, the soil becomes compact, but with cultivation under normal moisture conditions it has a good tilth.

The Simmons fine sandy loam occurs in a few small areas within the lower or terrace-plain portion of the county, mainly in the eastern part. The surface is level to slightly depressed. The drainage is imperfect, although the soil quickly dries out so that it can be cultivated. The type is of relatively small extent and of little importance. Most of it is in cultivation, being used mainly for the production of staple field crops, although near Abilene considerable quantities of vegetables are grown on it. Ditching undoubtedly would improve the more poorly drained areas.

SIMMONS CLAY.

The Simmons clay consists of dark-brown to black clay, usually somewhat silty and friable at the immediate surface, but stiff and plastic below. Frequently there is little change in color throughout the 3-foot section, but ordinarily the lower subsoil is somewhat lighter brown or drab. There are in places spots of brown to dark-brown clay overlying a brown clay which becomes lighter colored below, changing with greater depth to chocolate brown or yellowish brown. Such lighter colored material is commonly found on the slight hummocks of the hog-wallow areas. The soil in the depressions between the hummocks is black and the plowed fields have a spotted appearance. When wet the soil is sticky, but when dry it is crumbly. The subsoil when wet is rather sticky and plastic. Small, rounded quartz and chert gravel is frequently present on the surface and is occasionally present throughout the 3-foot soil section. The lower subsoil frequently shows streaks of powdery lime carbonate, and also in places contains small lime concretions. Both soil and subsoil are usually calcareous. In places, as north of Potosi, small and large fragments of limestone occur on the surface, especially on and near the slopes, and in places greenish-yellow to grayish, soft, calcareous clay, apparently residual from the underlying limestone, is encountered in the lower subsoil. Over the typical soil no limestone fragments are present, either on the surface or in the soil section. The limestone fragments found in local areas would indicate a residual origin of such areas, yet they may have been brought to the surface by burrowing animals. The typical soil appears to consist of outwash-plain or terrace-plain material, corre-

sponding in origin to the Bastrop series, from which it differs in its darker color, the result of poor drainage.

The surface of this type is level and the natural drainage imperfect, although under existing climatic conditions the soil dries out sufficiently to permit its use for crop production. The Simmons clay is one of the more extensive soils of the county. About one-third of it is in cultivation. Cotton, milo, kafir, feterita, Johnson grass, and sorghum cane are the important crops. Wheat, oats, and corn are grown to some extent. A large proportion of the type is used for grazing cattle. Raising hogs is also an important interest.

The Simmons clay is a productive soil. Cotton produces from one-fifth to three-fourths bale per acre. The grain sorghums yield 10 to 30 bushels, wheat 5 to 20 bushels, and oats 10 to 30 bushels. The yield of Johnson grass hay ranges from 1 to 3 tons per acre. Garden crops give uncertain and variable yields, owing to the occurrence of droughts. The droughts also affect the yields of the field crops, as on other types. The Simmons clay is valued at about \$20 to \$35 an acre.

Owing to the tendency of this heavy soil to compact on drying and to form intractable clods if plowed when wet, care must be taken to plow when the material is in the most favorable condition as regards moisture. Heavy teams and implements are needed to plow the land properly. Plowing should extend to a depth of 6 to 8 inches. Frequent shallow cultivations must be given to prevent undue loss of moisture.

MILLER FINE SANDY LOAM.

The Miller fine sandy loam consists of reddish-brown to brown, friable fine sandy loam, 6 to 15 inches deep, underlain by brownish red clay. In places the subsoil consists of fine sandy loam.

This soil is limited to a few scattered areas within the alluvial bottoms. It occurs as low knolls and ridges and broad swells, lying slightly higher than the surrounding heavier textured types. It is well drained, and in normal seasons satisfactory crop yields are obtained. The type is subject to overflow, but crop injury from this source is of rare occurrence.

This is one of the desirable soils of the county, in that it is easily cultivated and has good drought-resisting qualities. It is of relatively small extent, but most of it is in cultivation, being used in the production of staple field crops and some truck crops. Through the addition of organic matter, as by plowing under a green cover crop occasionally, the productive capacity of the type could doubtless be improved. A wider variety of crops, including such crops as peanuts and artichokes for hog pasture, could probably be grown successfully.

Miller fine sandy loam, light phase.—The light phase of the Miller fine sandy loam consists of a reddish-brown or chocolate-brown loamy fine sand, which passes downward into looser, lighter reddish or salmon-colored fine sand, loamy fine sand or loamy very fine sand, with heavier included layers in places. The phase generally occurs near the banks of streams, usually in a position somewhat higher than that occupied by the associated heavier textured bottom soils, and drainage is rather excessive. The common crops of the region are grown.

MILLER LOAM.

The Miller loam consists of a reddish-brown to chocolate-brown, mellow loam, 6 to 10 inches deep, overlying brownish-red clay. The lower subsoil is a stiff clay, usually of a lighter shade of red than the upper subsoil.

This type occupies a few areas in the stream bottoms. The surface is generally level and drainage is good. The type is subject to occasional overflows, but injury to crops from this source is of rare occurrence.

The Miller loam, although not extensive, is one of the important types of the county. It is easy to cultivate and very productive. The greater part of it is in cultivation. Cotton, milo, kafir, feterita, and Johnson grass are extensively grown and sorghum for forage, wheat, oats, and corn to a less extent.

MILLER SILTY CLAY LOAM.

The Miller silty clay loam consists of a reddish-brown silty clay loam, underlain at 5 to 8 inches by brownish-red clay, which becomes compact and of light-red color in the lower part. In places the subsoil is calcareous.

Small areas of the Yahola silty clay loam, which differs from the Miller silty clay loam in having a lighter textured, looser, and lighter colored subsoil, occur near the stream banks. This soil is less retentive of moisture than the Miller and is perhaps somewhat less productive.

The Miller silty clay loam has a comparatively extensive occurrence in the overflowed bottoms. The surface is generally level, but the areas for the most part are well drained. Occasional overflows take place, but crops are seldom injured.

The Miller silty clay loam is an important soil in the agriculture of the county. Though the heavy texture makes cultivation somewhat difficult, the natural productiveness is recognized and possibly one-half of the type is in cultivation. Cotton, milo, kafir, feterita, Johnson grass, sorghum cane, wheat, oats, and corn are crops of more or less importance. Some alfalfa is grown.

The yield of cotton ranges from one-fifth to three-fourths bale, grain sorghums 10 to 30 bushels, wheat 5 to 20 bushels, oats about 10 to 30 bushels, and Johnson grass about 1 ton to 3 tons per acre. The yields of garden crops are uncertain, except where irrigated, owing to the susceptibility of these crops to drought. Apparently alfalfa could be given a more important place in the agriculture on this type.

A few scattered pecan trees occur near the streams in places. A smaller growth, consisting of various thorny shrubs and bushes, cactus, and coarse grass, occurs, but this is generally of little value for grazing. Beef cattle and hogs are raised to some extent.

The Miller silty clay loam is valued at \$20 to \$35 an acre. Some parts of the type have a higher value because of their location near markets.

MILLER CLAY.

The Miller clay is a reddish-brown or dark brownish red clay, somewhat silty and friable in the surface soil of some areas, but grading at a depth of 4 or 5 inches into brownish-red, stiff clay.

This is an important stream-bottom soil in the eastern part of the county. It forms large areas west of Abilene. It has a level surface favorable to cultivation, though its heavy texture makes tillage somewhat difficult, and heavy implements and teams are necessary.

Most of the Miller clay is in cultivation. Good yields of the various crops of the region are obtained. Alfalfa succeeds on it, and could profitably be grown more extensively.

FRIO LOAM.

The Frio loam consists of a dark-brown to black loam, 6 to 15 inches deep, underlain by brownish-colored to dark-drab clay. The lower subsoil in places is calcareous.

This soil forms a part of the bottom lands. The surface is ordinarily flat, though some areas include hummocks and broad swells. The soil in these is a fine sandy loam, and would have been mapped separately if of greater extent. The type is subject to occasional overflows, but otherwise the drainage conditions are good and crop injury from excess moisture seems to be of rare occurrence.

While of moderate extent, this is one of the more desirable soils of the county. It is easy to till, and with proper cultivation fairly retentive of moisture. The vegetation is similar to that on the Miller silty clay loam. Possibly one-half of the type is used for pasture. Cotton, milo, kafir, feterita, Johnson grass, sorghum for fodder, wheat, oats, and corn are the principal crops on the remainder.

Cotton yields from about one-fifth to three-fourths bale per acre, the grain sorghums about 10 to 30 bushels, wheat 5 to 20 bushels, and oats about 10 to 30 bushels. Johnson grass yields from about

1 ton to 3 tons per acre. Garden crops are uncertain, owing to the occurrence of drought, but they are grown in sufficient quantities for home and local use. The yields of all crops, and particularly of vegetables, vary according to the amount and distribution of rainfall. Alfalfa should prove successful on this soil.

Beef cattle and hogs are raised to some extent. The farm buildings usually are located on adjoining higher land or on higher parts of the type, which are not subject to overflow.

The Frio loam is valued at about \$20 to \$35 an acre.

FRIO CLAY.

The Frio clay consists of dark-brown to black clay, underlain at 1 inch to 3 or 4 inches by black or very dark brown, calcareous clay. The subsoil is lighter colored in the lower part, usually being brown.

This type is encountered in several areas within the stream bottoms. The surface is flat, with local variations consisting of hummocks, depressions, and long, low swells. Ordinarily the areas are well drained. Occasional overflows occur, but as a rule these are of short duration.

The Frio clay is of moderate extent. Cotton, milo, kafir, feterita, Johnson grass, sorghum cane, wheat, oats, and corn are the principal crops, together occupying about one-third of the total area. The native vegetation is similar to that on the Miller silty clay loam. Beef cattle and hogs are raised.

This is a valuable bottom-land soil, well suited to cultivation. The low-lying areas most subject to overflow or poor drainage are best used as native pasture, or, if cleared of their native growth, may be used for Johnson grass and other grasses for the production of hay and pasturage.

ROUGH STONY LAND.

Rough stony land includes the steep, stony scarps of the plateau remnants, consisting mainly of massive limestone exposures and rock fragment débris along their lower slopes; the exposures of massive sandstone, shale, conglomerate, limestone, and stony débris about the base of the plateaus; and detached outlying stone areas within the lower terrace plain.

These rough areas support a sparse growth of grass, weeds, and shrubs, with some live oak and mesquite trees, and are of less value for grazing than the stony soil types.

SUMMARY.

Taylor County lies just northwest of the center of the State of Texas. It is approximately 30 miles square and has an area of 908 square miles, or 581,120 acres.

The county includes remnants of a high plateau, 200 to 300 feet above a lower plain, lying from 1,750 to 2,000 feet above sea level. The plateau remnants occupy more than one-fourth of the area of the county and for the most part are stony pasture lands. The greater part of the plain section is well suited to cultivation.

The drainage of the county is complete, practically every portion being reached by some natural drainage way.

In the 1910 census the total population of the county is given as 26,293. Abilene, the county seat, is the largest town, with a population of 9,204. Practically all the towns and the greater part of the population are in the lower plain sections.

The plainlike section of the county is well supplied with railway facilities and for the most part with fairly good roads. Abilene and Merkel are important shipping points.

The annual rainfall—about 25 inches—is irregularly distributed, and long periods of drought occur. The temperature conditions are such that farm work can be carried on and crops of some kind grown throughout the year. The mean annual temperature is reported as 63° F.

In 1910 the area in farms was 81 per cent of the area of the county and 43 per cent of the land in farms was improved.

Cotton is the most important crop, followed by hay and forage, the grain sorghums, corn, oats, and wheat.

The raising of stock, mainly beef cattle and hogs, with some sheep and goats, horses and mules, is an important industry.

The farm practices seem well suited to local conditions, except that there is a general need for deeper plowing and more thorough cultivation to conserve soil moisture.

Twenty-six soil types, exclusive of Rough stony land, are mapped. These are grouped in nine soil series.

Heavy soils, the clay loams, silty clay loams, silty clays, and clays, occupying about 45 per cent of the county, and lighter soils, loams, fine sands, and fine sandy loams, occupying about 27 per cent, represent the lands that are mainly suited to cultivation. The sandy soils are recognized as more drought resistant than the heavier textured soils. The remaining 28 per cent of the area of the county comprises stony and gravelly lands that are best adapted to and mainly used for grazing.



[PUBLIC RESOLUTION—No. 9.]

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

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

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

Approved, March 14, 1904.

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

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