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DIVISION OF FARM AND RANCH ECONOMICS

IN COOPERATION WITH THE DIVISION OF FARM MANAGEMENT AND COSTS, BUREAU OF AGRICULTURAL ECONOMICS, U. S. DEPARTMENT OF AGRICULTURE

A DESCRIPTION OF THE AGRICULTURE AND TYPE-OF-FARMING AREAS IN TEXAS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
T. O. WALTON, President

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Texas is primarily an agricultural State. Approximately 40 per cent of the 5,824,715 people in the State lived on farms in 1930. Of the persons 10 years or older gainfully employed in the State, 38 per cent were engaged in agriculture, while only 17 per cent were engaged in manufacturing and mechanical industries, the second largest source of employment in the State.

The 34,766,166 acres of crop land in Texas in 1929 comprised 21 per cent of the total land area of 167,934,720 acres in the State and 28 per cent of the 124,707,130 acres included in the 495,489 farms operated that year. The remainder of the land in farms was used primarily for pasture. The 43,227,590 acres in the State not reported in farms were in forest lands, owned mostly by lumber interests and located principally in the southeastern part of the State; in a limited amount of waste land and land either not appropriated into farms or not reported to the census enumerators; and in land in cities, roads, rivers, etc.

Cotton, the leading crop, made up 61 per cent of the cash income from all crops during the 10-year period 1924-1933 and occupied approximately 55 per cent of the harvested crop land in 1929. Percentages of the crop land occupied by other crops were corn 14, sorghums harvested for grain and forage 13, wheat 10, oats 4, hay 2, while barley and vegetables harvested for sale each occupied approximately .6 per cent of the harvested crop land.

Cattle, which are second to cotton as a source of cash farm income, made up over half of all livestock kept on farms in 1930. Of the total animal units (cow equivalents), cattle comprised 55 per cent, mules 12 per cent, sheep 10 per cent, horses 9 per cent, and goats, hogs, and poultry approximately 3 per cent each.

The distribution of these various crop and livestock enterprises over the State and the proportions in which they are combined in each county are shown by means of maps and charts.

On the basis of differences in such physical characteristics as soils, surface, and climate, in the kinds and proportions of crops and livestock grown, and in the prevailing production practices, the State has been divided into 18 major type-of-farming areas, 11 of which are further divided into 30 sub-areas. It is the purpose of this bulletin to call attention to these areas, and to present descriptive material relating to the natural and economic factors contributing to their development so as to provide those interested in the agriculture of Texas with a general knowledge of the character of agricultural production in different parts of the State.

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A DESCRIPTION OF THE AGRICULTURE AND TYPE-OF-FARMING AREAS IN TEXAS

C. A. BONNEN[1] AND B. H. THIBODEAUX[2]

Texas Agricultural Experiment Station, Division of Farm and Ranch Economics, and Bureau of Agricultural Economics, Division of Farm Management and Costs, United States Department of Agriculture, Cooperating.

Texas is primarily an agricultural State. The 1930 census indicates that approximately 40 per cent of the 5,824,715 people in the State lived on farms and that approximately 38 per cent of the persons 10 years of age or older gainfully employed in the State were engaged in agriculture. This compares with 17 per cent of the working population engaged in manufacturing and mechanical industries, the second largest source of employment in the State. The estimated farm value of agricultural products in 1929 amounted to $933,235,000.

The agriculture of Texas is widely diversified, ranging from sub-tropical fruits and a wide range of vegetables in the southern tip of the State to specialized large-scale wheat production in the northwest, and from crop farming under humid conditions in the east to sub-humid farming and extensive livestock grazing in the west. This wide diversity in production is directly related to the wide differences in soils, climate, and surface in the different parts of the State through the influence of these factors on crops that can be grown and on the resulting kinds and numbers of livestock kept. Closely associated with these physical conditions are the biological considerations of insect pests and diseases. The choice of lines of production under these environmental limitations is also influenced by those numerous economic factors, including transportation facilities and charges, labor, available capital or credit facilities, expenses of production and prices received, etc., that determine the enterprises or combinations of enterprises that may return the most profits. The individual producer's aptitude and personal preferences also constitute a factor determining within limits the choice of lines of production on individual farms, but for an area as a whole this factor is not so important as are physical and economic considerations, unless these considerations permit a wide latitude in the enterprises that may profitably be kept. For example, physical limitations reflected in relative costs and incomes prevent the profitable production of citrus in Texas in sections other than in the southern part of the State.

This process of adapting production to the natural environment and to economic and social factors is a continuous one. Physical limitations at a given time may later be partly or entirely offset. For example, the development of drought-resistant varieties of crops or the adoption of production methods that lower costs so much as to permit profitable production despite low yields may result in the bringing into cultivation of land formerly considered suitable only for grazing. Changes in the agriculture of an area or region may also result from changes in the relative incomes from certain enterprises due to reductions in yields by insects and diseases or to changes in relative prices received.

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Furthermore, the agricultural areas are rare in which the utilization of agricultural resources is such as not to result in serious production problems which sooner or later are reflected in economic and social losses. In formulating production programs to obtain the greatest immediate benefit from farming operations, long-time considerations are often obscured by the larger returns obtainable from exploitation. In other cases, land of high potential productivity is idle or used for extensive purposes when its highest economic use would be realized only if it were put into crops. These conditions of maladjustment often can be corrected only through the experience of producers themselves, or through careful experimentation and observation.

This publication deals with the first phase of a comprehensive study of agricultural adjustments in Texas, and is a revision of Texas Agricultural Experiment Station Bulletin No. 427, Type-of-Farming Areas in Texas. There is presented herein a graphic picturization of Texas agriculture and of some of the principal factors that have contributed to its development. Written material is limited to the minimum to permit even a hasty examination to yield a broad understanding of the varied lines of agricultural production in the State. There is presented first a brief historical sketch of the development of Texas agriculture from 1836, when Texas became independent of Mexican rule, to 1935. This is followed by a graphic presentation and explanatory discussion of the major factors that influenced the present development of Texas agriculture. This in turn provides the background for a series of charts showing the geographic distribution of the various crop and livestock enterprises in the State and of certain related developments such as earnings, tenancy, farm power, etc. Lastly, the State is divided into so-called type-of-farming areas in which the farm organizations and production methods are highly uniform, and a brief description is given of each area.

This part of the study of agricultural adjustments in Texas is primarily descriptive in nature and serves only incidentally to point out the reasons for and the problems connected with the present utilization of land and other agricultural resources. The latter considerations will be covered in later phases of the study, now under way, in which the various type-of-farming areas in the State will be studied with reference to the agricultural resources in the area as a whole, the systems of farming followed, the economic and other problems arising from the present production patterns, and the adjustments needed to utilize most effectively the agricultural resources so as to maintain or increase the well-being of farm families.

A large part of the information used in this publication is derived chiefly from the reports of the United States Census of 1930. These data are more representative of the agriculture of the State than the 1935 census data now available. The latter data pertain to 1934, a year of unprecedented drought and consequent serious agricultural dislocations. The Agricultural Adjustment Administration reduction programs of 1934 also affected the relative proportions that otherwise would have prevailed as between various enterprises. In 1934, the harvested crop acreage in the State was 17 per cent less than in 1929. The acreages in cotton and wheat in 1934 were 34 and 12 per cent lower, respectively, than the average acreages in these crops during the 5-year period 1928-1932.

HISTORICAL BACKGROUND OF TEXAS AGRICULTURE[1]

During the Spanish occupancy of Texas, lasting from Coronado's first formal claim of the Texas territory for the Spanish crown in 1540 until 1821, the State was undeveloped agriculturally, except for the small efforts made by the early religious missions. Only negligible progress was made at colonization. The immediate returns yielded by the precious metals found in Mexico and South America held more attraction for the Spaniards than the uncertain gains of developing agriculture and commerce in the Indian-inhabited wilderness that lay to the north. The sporadic efforts at colonization were not aggressively sponsored or aided by the Spanish Government. Of the twenty-five presidios and missions established by the Spaniards, only three remained at the time Anglo-Americans began to arrive in the early part of the nineteenth century. Although a few extensive titles to land had been granted by the Spanish crown, these were not developed agriculturally.

With the overthrow of Spanish rule and the acquisition of Texas by Mexico in 1821, colonization was given an impetus through the work of impresarios, or promoters, who contracted with the Mexican Government to bring in specified numbers of settlers in return for grants of land. Largely through the efforts of these men, the population increased from an estimated 7,000 whites and civilized Indians in 1806 to 20,000 whites in 1831, and 30,000 in 1836. Including the relatively small number of titles issued under Spanish authority, 26,280,000 acres had been granted for settlement by the close of 1835. At the time of the Texan declaration of independence from Mexico in 1836, the settlers had attained a degree of agricultural prosperity that gave promise of the large opportunities in the still relatively undeveloped territory.

As an independent republic and later as a state, Texas resorted to her vast land area as a source of revenue to meet her public debt and to finance governmental functions. As distinguished from other states, Texas retained the ownership of her public lands after she became one of the United States in 1846. She was thus able to benefit both from the initial disposal of land and, with its subsequent improvement, from the taxes that it later provided. In 1850, approximately 67,000,000 acres outside of the present state boundaries were sold to the United States for $10,000,000, an amount sufficient to retire the State public debt and to provide a surplus of $5,000,000 in the State Treasury. The present State Capitol was constructed by a business syndicate in return for 3,000,000 acres of land in the northwestern part of the State. Although additional direct land transfers for cash in the form of sales of land certificates or scrip amounted to only 1,329,200 acres, large grants of state land were made to individuals, impresarios, railroads, and other internal improvement companies, and to educational and eleemosynary institutions. By 1910 the legislature had disposed of practically all of the public land in Texas.

[1]References used include History of Texas, by John Henry Brown; A History of Texas and Texans, by Frank W. Johnson; History of Texas and the North Mexican States, by H. H. Bancroft; and Public Land System of Texas, by Reuben McKitrick.

Table 1. Rural and urban population, railroad mileage, agricultural land use, value of farm land per acre, acreages in specified crops, and numbers of various classes of livestock on farms and ranches by census periods, Texas, 1860-1935. (U. S. Census data unless otherwise specified.)

Item	Unit	1860 (June 1)	1880 (June 1)	1900 (June 1)	1920 (Jan. 1)	1930 (April 1)	1935 (Jan. 1)	1950
Total population	1000 persons	604	1,592	3,049	4,663	5,825		7,695
Persons engaged in all occupations (10 years and over)	1000 persons	105[1]	522	1,033	1,719	2,207		
Persons engaged in agriculture (10 years and over)	1000 persons	62[1]	359	642	788	842		
Proportions of persons in all occupations engaged in agriculture (10 years and over)	Per cent	59[1]	69	62	46	38		
Railroad mileage, exclusive of yard track and sidings[2]	100 miles	3	32	99	160	169	164[3]	
Total number of farms	1000 farms	43	174	352	436	495	501	
Land in farms	1000 acres	25,344	36,292	125,807	114,021	124,707	137,597	
Average size of farms	Acres	591	208	357	262	252	275	
Proportion of total land area in farm land	Per cent	15	22	75	68	74	82	
Improved farm land[4]	1000 acres	2,651	12,650	19,576	31,228	45,923	43,296	
Proportion of total land area in improved land	Per cent	2	8	12	19	27	26	
Land irrigated	1000 acres	[5]	[5]	50	586	785		
Value of farms (includes land, fences, and buildings)	1000 dollars	88,101	170,469	691,774	3,700,173	3,597,407	2,573,705	
Production of specified crops:								
Cotton	1000 bales	341[6]	805[6]	2,585[7]	2,972[7]	3,793[7]	2,306[7]	
Corn	1000 bushels	16,501	29,065	109,970	108,377	66,251	38,018	
Wheat	1000 bushels	1,478	2,568	12,266	36,427	44,078	26,298	
Rice (rough)	1000 bushels	1	2	259	5,306	5,159	5,498	
Oats	1000 bushels	986	4,893	24,191	63,989	27,260	32,013	
Grain sorghums	1000 bushels	[5]	[5]	482	36,456	23,768	9,642	
Numbers of specified classes of livestock on farms and ranges:								
Horses and mules (all ages)	1000 head	389[8, 9]	938[8, 9]	1,793	1,847	1,809	1,576	
Cattle	1000 head	3,536[8, 9]	4,895[8]	9,428	6,157	6,603	7,222	
Sheep	1000 head	753[8, 9]	3,652[8]	1,889	2,573	7,021	7,027	
Goats	1000 head	[5]	[5]	627	1,753	3,142	[5]	
Swine	1000 head	1,372[9]	2,450	2,666	2,226	1,561	1,384	
Chickens	1000 head	[5]	3,128[10]	13,562[11]	18,063	21,526[11]	[5]	

[1] All ages.
[2] Data from 1860 through 1890 obtained from Texas Almanac, and for subsequent years from Railroad Commission of Texas.
[3] Preliminary, from Railroad Commission of Texas.
[4] Includes all land regularly tilled or mowed, land in pasture that has been cleared or tilled, land lying fallow, land in gardens, orchards, vineyards, nurseries, and, except in 1930 and 1935, land occupied by farm buildings.
[5] No reports.
[6] 500-pound-bale equivalents.
[7] Running bales.
[8] Excludes spring colts, lambs, and calves.
[9] Excludes range horses and mules, cattle, sheep, and swine.

Following the annexation of Texas by the United States and the final settlement of the Mexican claims with the termination of the United States-Mexican War in 1848, tremendous increases were made in population numbers and in the concurrent development of natural resources in the State. The first formal census enumeration, made in 1850, showed a total population, excluding Indians, of 212,592. There were approximately 11,398,337 acres of land in farms, of which approximately 639,117 acres were improved. Between 1850 and 1860, the population of Texas was nearly trebled, and the land in farms had increased to 25,344,000 acres, of which 2,651,000 acres were improved. This rapid development was made possible by the construction of transportation facilities and by the gradual settling of the Indian question.

The Civil War impoverished the State and disrupted its agriculture, but following the reconstruction period the sharp upward trend in population, production, and related factors was resumed. The nature and extent of agricultural production and data on certain related factors such as population and railroads are shown in Table 1.

FACTORS INFLUENCING THE AGRICULTURAL DEVELOPMENT OF TEXAS

Physical and Biological Factors

Land and its attributes of soil, surface, and climate constitute the physical factors that influence the kinds and amounts of agricultural production. The operation of these factors is usually well understood because of the easily discerned changes in vegetative covering or in the kinds of crops that are associated with changes in the physical environment.

The climatic conditions of temperature and moisture determine the range of crops that may successfully be grown. These conditions vary widely within the State but their influence from one climatic zone to the other is manifested only gradually. More sharp are the changes in kinds of crops caused by differences in soil types and surface features. Although a variety of crops may be grown under a given set of climatic conditions, the specific localization of these crops will depend largely on soil and surface differences. Certain soil types are better suited to cotton, for example, than to other crops because of the relatively higher cotton yields obtained. Other soils of relatively lower productiveness or on slopes too steep for the successful production of cultivated crops may be used primarily for grazing. This is well illustrated by the distinct change from the intensively cropped land in the lower part of the fertile, gently rolling Black Waxy Prairie to the grazing lands in the roughly surfaced Edwards Plateau immediately to the west.

The biological factors of insect pests and diseases also affect the character of agriculture and may cause changes in the crops grown and livestock kept. Biological factors are usually more subject to control, however, than the physical conditions discussed above. Unfortunately, data are not available on the extent to which insects and diseases affect agricultural production in the various parts of the State. Figures 1 to 9 pertain, therefore, to the physical factors that influence agricultural production in Texas. A brief explanatory discussion is shown at the bottom of each chart.

Figure 1.—Texas, comprising approximately 167,934,720 acres, may be subdivided into 12 natural geographic areas on the basis of differences in surface features, related soil types, and native vegetation. These 12 areas may be further subdivided into 39 sub-areas in which the principal soil series are closely related. The types of soils in Texas range from dune sands in parts of western and southwestern Texas to heavy clays in the central and coastal prairies. Sharp differences in soils often result in wide differences in cropping systems even when surface and climatic conditions are similar. Note, for example, the soil differences and resulting sharp demarcation of the wheat from the cotton areas in the High Plains. (Figures 1, 35, and 39.)

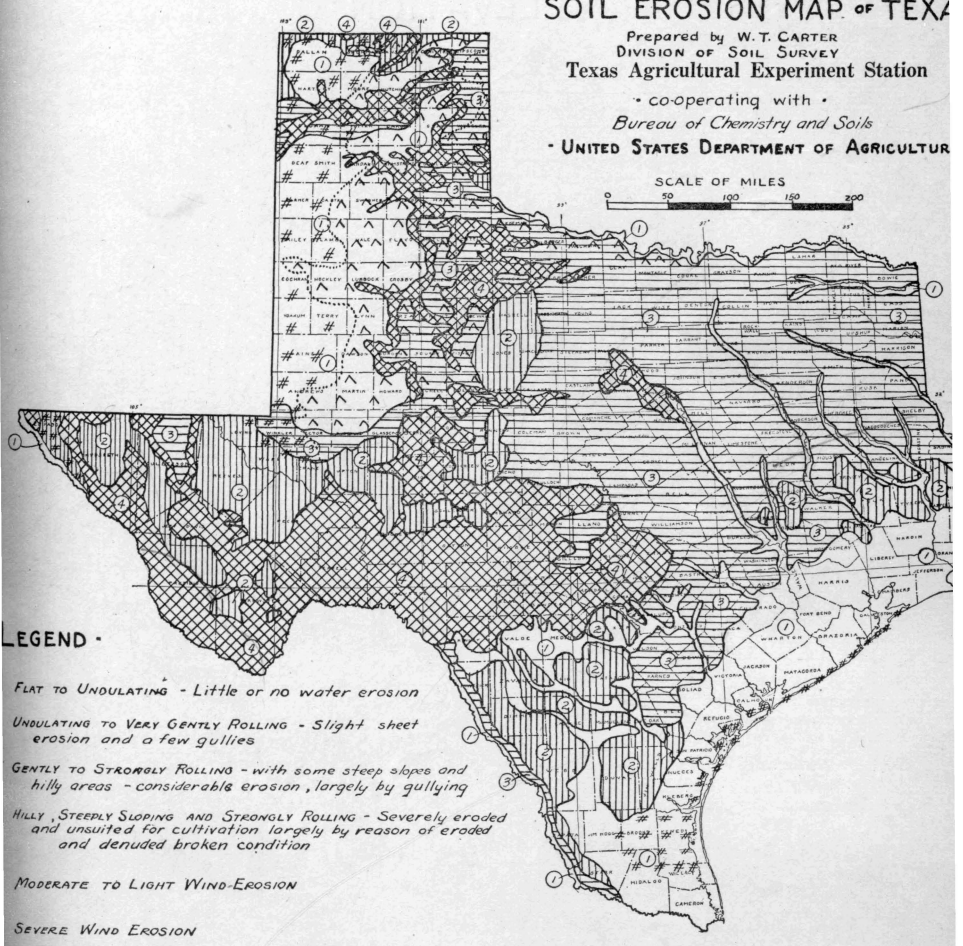


Figure 2.—Soil erosion in Texas presents a problem of vast importance because of the physical handicap it places upon agricultural production. As indicated on the map, there are large areas in the State that are in serious need of conservation practices that will halt the loss of top-soil now in process of being washed or blown away. Another aspect of the soil conservation problem that is not generally recognized is the more effective utilization of available moisture through the control of run-off water in areas of limited rainfall.

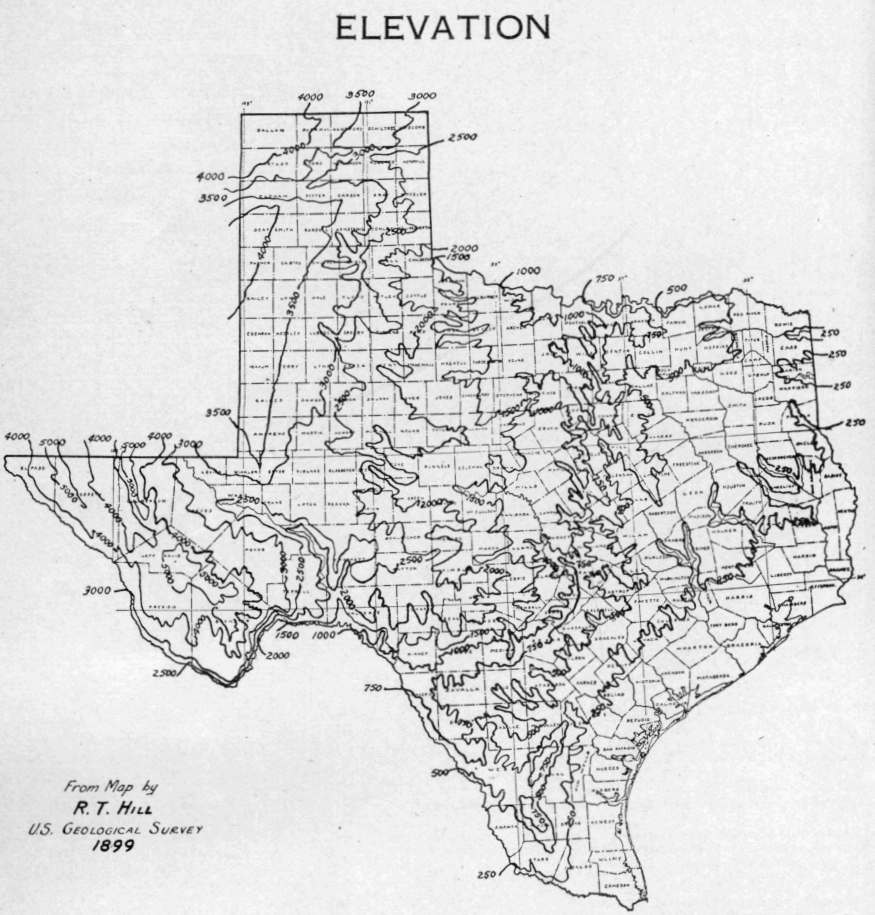


Figure 3.—Approximate location of lines of equal elevation in Texas. The State slopes from the northwest to the southeast, ranging from more than 4,000 feet in elevation in the Panhandle Area to near sea level in the Gulf Coast Area, in large parts of which drainage is a serious problem. Differences in elevation are closely related to differences in the length of growing season. (Figure 6.)

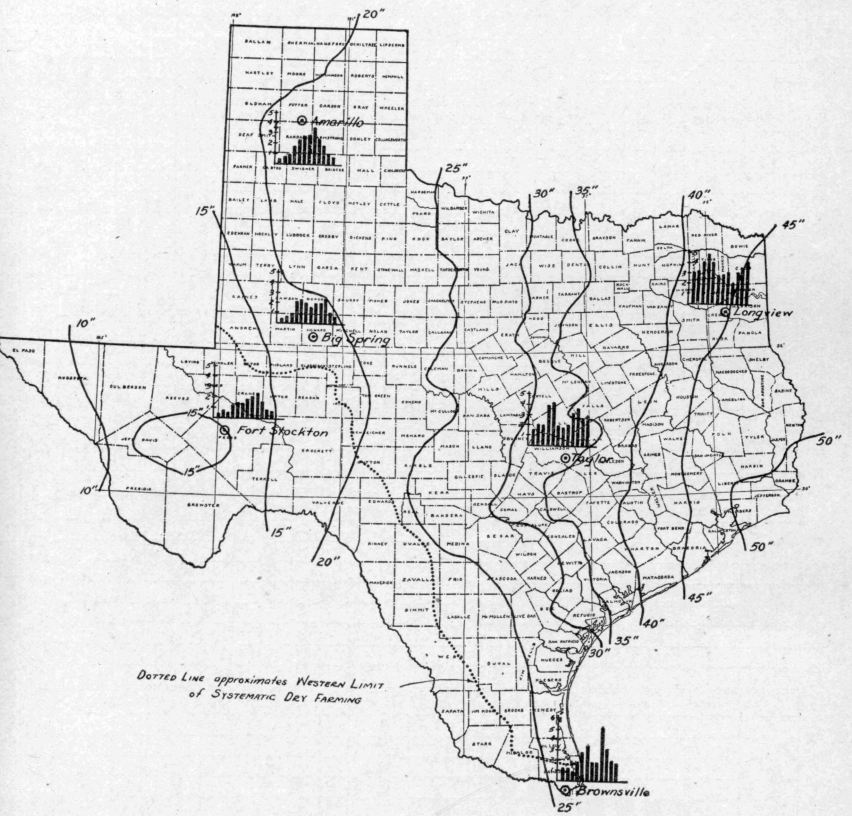


Figure 4.—**Average annual rainfall, in inches, and average monthly distribution of rainfall at selected stations in Texas.** (U. S. Weather Bureau.) The annual rainfall in Texas ranges from 50 inches in Orange and Jefferson Counties in the easternmost section of Texas to less than 10 inches in the extreme western part. Note the dotted line designating the approximate western limit of dry farming. An example of the effect of rainfall on the production of dry-farmed crops in Texas may be noted from the geographic distribution of the acreages in corn and grain sorghums. Corn is the principal feed-grain crop east of the 25-inch rainfall line but west of that line it is relatively much less important than grain sorghums. (Figures 4, 36, and 37.)

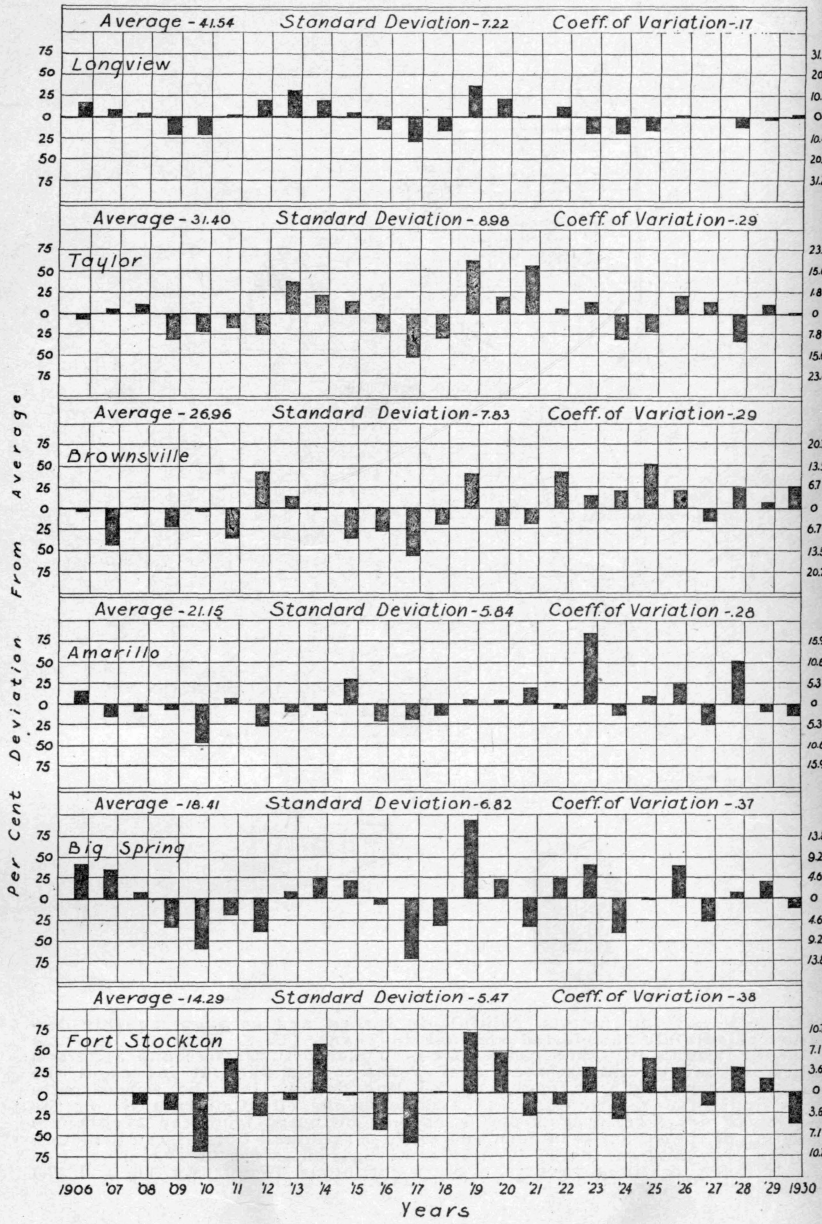


Figure 5.—**Yearly variations from average annual rainfall at selected stations in Texas, in inches and in percentages, for the period 1906-1930.** (U. S. Weather Bureau.) Standard deviation expresses the limits of variations, above and below the average, within which approximately two-thirds of the years at a single station will fall. The coefficient of variation furnishes, on the other hand, a measure of variability as between stations. The variability of annual rainfall and the probability of droughts become increasingly great from east to west in Texas.

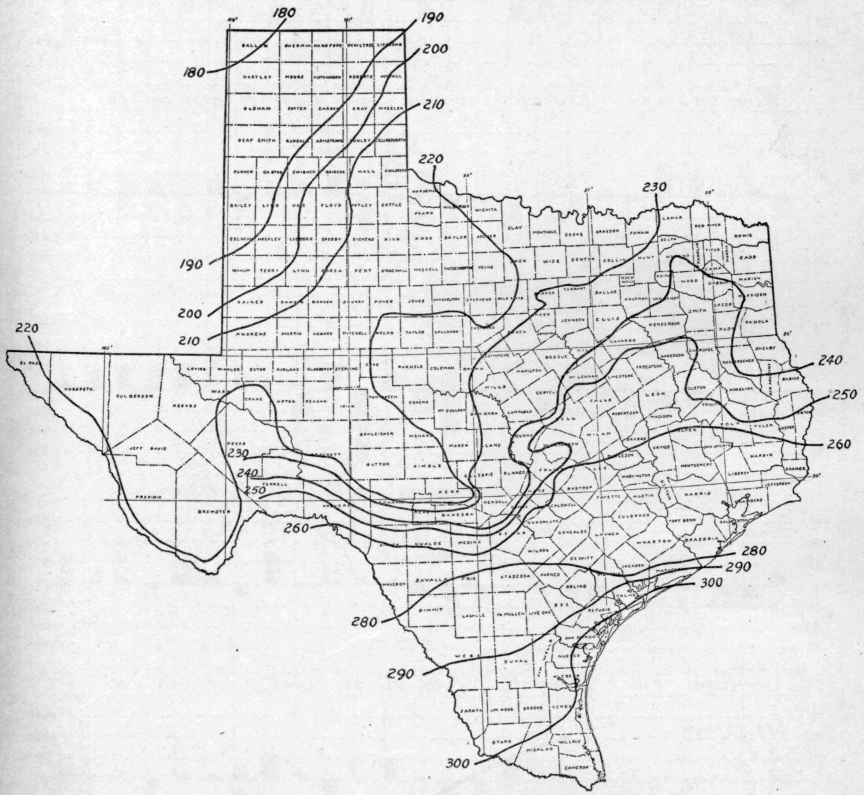


Figure 6.—**Average length of growing season in Texas, measured by the number of days between the last killing frost in spring and the first killing frost in autumn.** (U. S. Weather Bureau.) The length of growing season is affected both by elevation, as pointed out in connection with Figure 3, and by latitude. The average length of growing season in Texas ranges from 300 days and over in the vegetable-citrus area of southern Texas to 180 days and less in the northwestern limits of the State. Relatively little cotton is grown at present in territory with a growing season of less than 190 days. (Figure 35.)

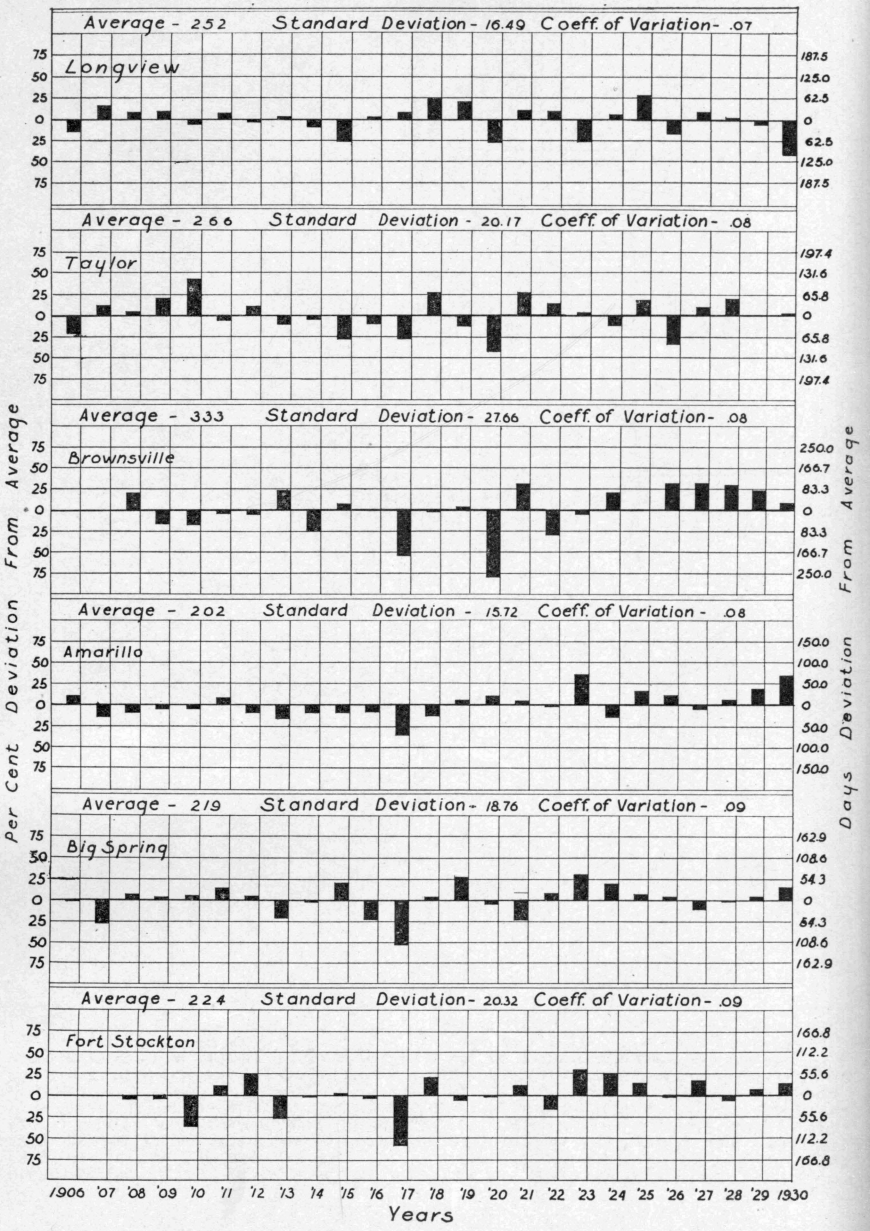


Figure 7.—**Yearly variations from average length of growing season at selected stations in Texas, in days and in percentages, for the period 1906-1930.** (U. S. Weather Bureau.) As in Figure 5, the standard deviation expresses the limits of variation, above and below the average, within which approximately two-thirds of the years at a single station will fall. The coefficient of variation furnishes, on the other hand, a measure of variability as between stations.

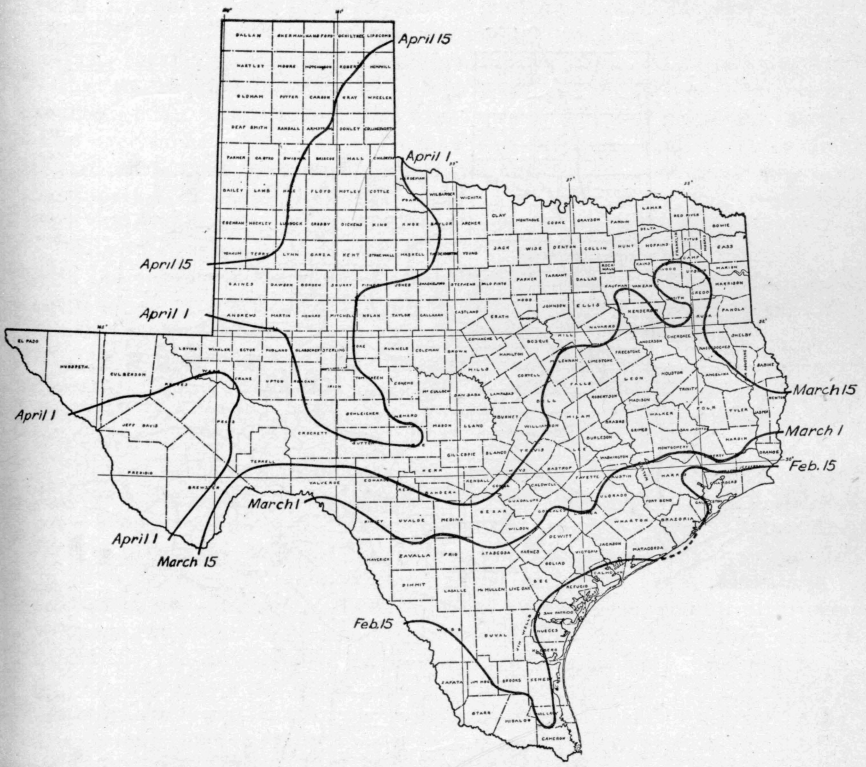


Figure 8.—**Average date of last killing frost in spring in Texas.** (U. S. Weather Bureau.) This figure together with Figure 9 serves to indicate the approximate beginning and ending of the growing season in Texas. The effects of spring temperatures on the time of planting a particular crop in the different parts of the State are readily detectable by a casual observer. Cotton harvesting in the Lower Rio Grande Valley is often under way in late June and early July, when the crop in the High Plains Area is still in the early stages of cultivation.

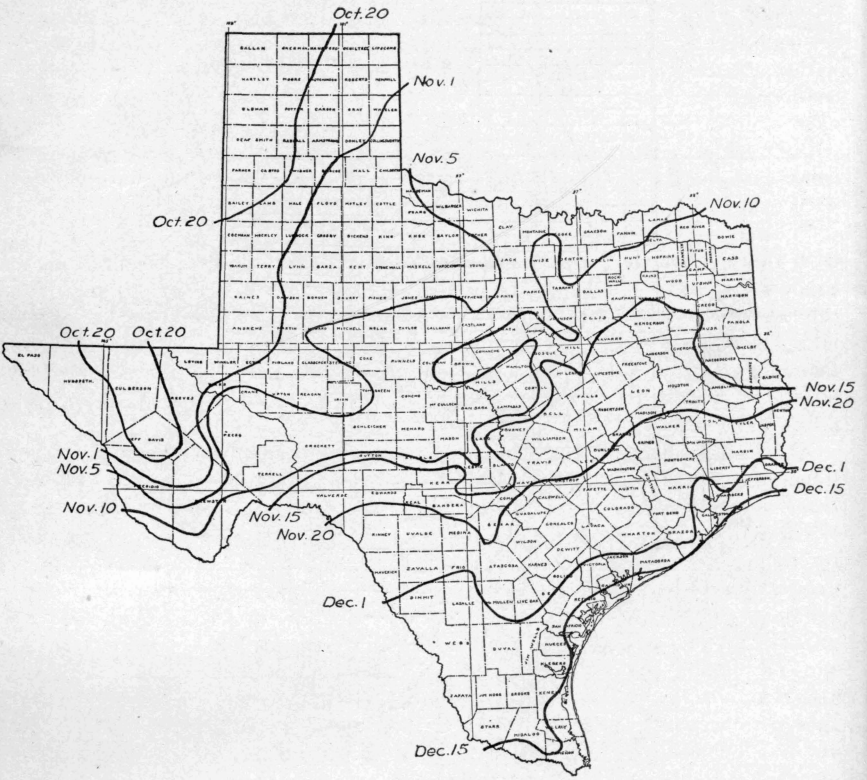


Figure 9.—**Average date of first killing frost in fall in Texas.** (U. S. Weather Bureau.) The northern limits of the successful production of some crops in Texas are established by the average date of the first killing frost in fall. In the northwestern limits of cotton production in Texas, for example, an occasional early frost before cotton is matured results in the production of low-grade "bollie" cotton.

Economic and Social Factors

The influence of economic forces in determining the choice of farm enterprises is usually not so apparent as that exerted by physical factors, but it is evident none the less. As agriculture became increasingly commercialized in Texas the economic considerations of relative costs and returns became primary factors influencing the choice of farm enterprises within the range established by the physical factors discussed in the preceding section. Market demands expressed in terms of price took precedence over home needs, and the production of commercial farm products within each area tended to become specialized in one enterprise or a combination of enterprises that yielded the greatest profit as compared with other enterprises adapted to the area.

The economic considerations of costs and returns are closely interrelated with the physical factors of soils, climate, and surface in determining the commercial enterprises in the State and in its component areas. The relative profitableness of various adapted enterprises in an area is determined by the relative yields or production obtained; by the relative amounts of land, labor, and materials needed to produce a given unit of products; and by the relative costs incurred and prices received for the products.

At given prices in central markets, the prices that farmers pay for cost items and the prices they receive for products sold depend on the distance from market, because of differences in the transportation and handling charges involved. As the distance from market increases, prices received for farm products decrease, whereas prices paid for market items used in production are increased. Because of the lower value per unit of product produced, wages also decrease with increased distance from urban centers, unless the use of extensive production methods yields a production per worker that offsets the lower price per unit of product. These conditions also result in lower land values as distance from market increases. All of these things point towards the practice of an extensive type of agriculture, yielding products of high value in relation to weight, at the outer limits of market areas. As the market is approached, there is a shift toward more intensive types of agriculture yielding bulkier or more perishable commodities with relatively high carrying charges. This factor of economic location is affected, of course, by changes in transportation methods and costs. Improvements in transportation facilities that result in a more economical movement of perishables or bulky products from distant points decrease the relative advantage of location near markets and permit the introduction or expansion of such commodities in areas in which physical or natural conditions are more favorable to their production. This is well illustrated by the expansion of the truck crop industry in the lower Rio Grande Valley and other parts of South Texas following the improvement of transportation facilities and the use of refrigerated cars.

Over a period of time, changes in the relative profits from different products may induce changes in the proportions or kinds of enterprises in an area. These changes in relative profits may be caused by one or more of a number of factors that may affect yields, prices paid and received, and

production methods. The operation of these factors is well illustrated in the development of the large-scale cotton areas in western Texas. A widespread shift from cattle grazing to cotton farming occurred following the relatively low cattle prices and high cotton prices of the early 1920's. This shift was made possible and was sustained by the development of drought-resistant crops and by the use of large-scale, low-cost production methods.

Despite the tendency towards specialization induced by the joint operation of physical and economic factors, there is no extensive area in Texas in which the most profitable farm enterprise is the only one. It is usually found desirable to include other farm-use enterprises of a complementary nature, despite relatively low returns, in order to utilize labor and equipment when these are not being used on the main enterprise, or to provide a rotation for soil maintenance or improvement. In other cases, secondary commercial enterprises may be included in the farm organization to provide an income to supplement that obtained from the major enterprise.

Lastly, the agricultural development of Texas and the choice of enterprises on individual farms in the State is affected by the human factor of the farm people themselves and by the economic and social forces and institutions associated with them. Personal preferences and aptitudes are important, within limits, in causing variations in the choice of farm enterprises. Custom and tradition likewise are important. Tenancy in some cases is both a cause and an effect of the type of farming followed. Relatively high real estate values and taxes, mortgage indebtedness, and associated factors may necessitate the following of a type of farming that may be too exploitative in nature to safeguard the continued productivity of the land.

Figures 10 to 25, inclusive, portray some of the important economic and social factors that have operated in conjunction with physical and biological conditions to shape Texas agriculture into its present pattern. It was not possible, however, to assemble all the data needed to furnish a complete explanation of the factors affecting the geographic distribution of agricultural enterprises in the State. For example, no data are available at present as to the average farm prices of cost items and of sales products in the different parts of the State. This and other discrepancies can be corrected, at least in part, only by means of detailed studies in each type-of-farming area.

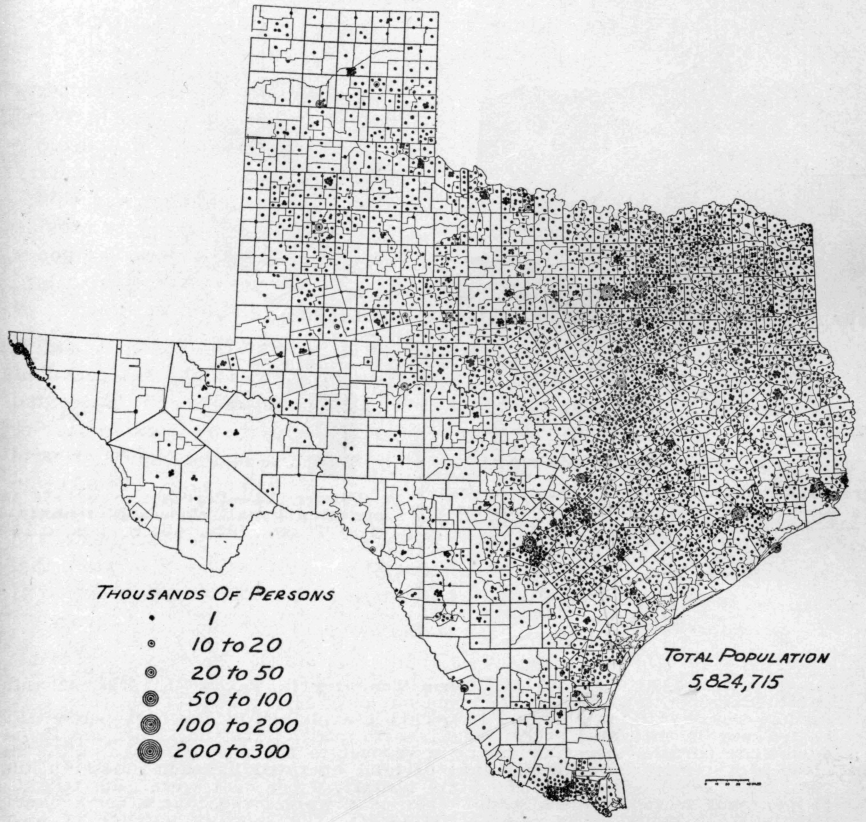


Figure 10.—**Geographic distribution of population in Texas, 1930.** (U. S. Census.) Agriculture is the leading industry in Texas in terms both of the number of people engaged in it and of the gross value of products. Of a total population of 5,824,715 persons in 1930, 2,342,553, or 40 per cent, were classed as farm population. Of a total of 2,207,118 persons 10 years old and older engaged in gainful occupations, 842,001, or 38 per cent, were engaged in agriculture. Note the close relationship between the distribution of population on this map and the distribution of crop land shown in Figure 26.

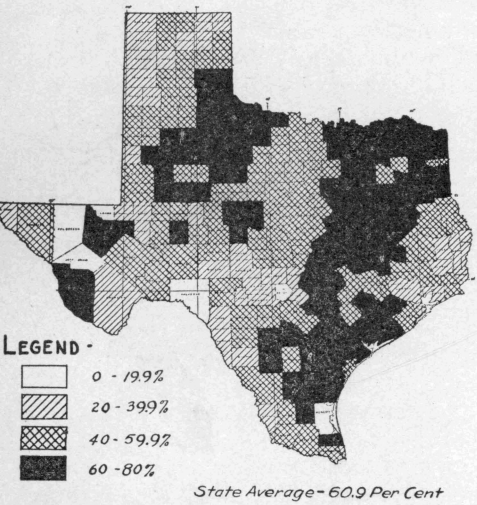


Figure 11.—Percentage of all farms operated by all classes of tenants, by counties, Texas, 1929. (U. S. Census.)

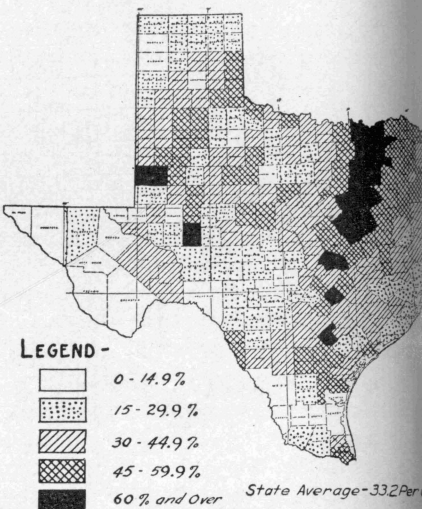
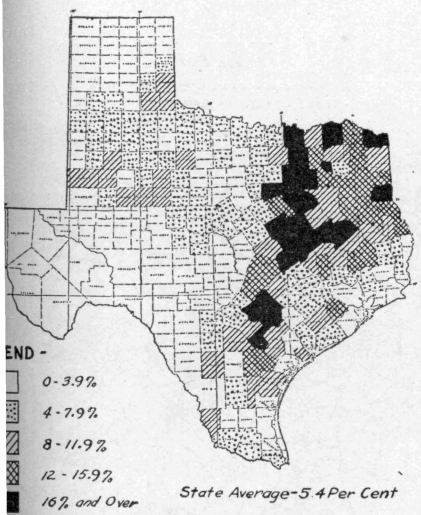


Figure 12.—Percentage of all farm operated by all classes of tenants, by counties, Texas, 1929. (U. S. Census.)

Figures 11, 12, 13, and 14. **Farm Tenantry in Texas.** In 1929, tenants operated 61 per cent of all the farms but only 33 per cent of the total farm land in Texas. (Figures 11 and 12.) This is explained by the high percentage of tenancy in intensively cropped areas in which farm units are small. A somewhat parallel situation exists in respect to the proportions of different classes of tenants and the amount of land operated by each class. Of the total number of tenants in the State in 1929, 6 per cent were cash tenants, 35 per cent were croppers, and 59 per cent were classed as other tenants, mostly "third-and-fourth" share tenants. On the basis of acreage of farm area operated by all tenants, however, 29 per cent was operated by cash tenants, 16 per cent was operated by croppers, and 55 per cent was operated by other tenants, mostly "third-and-fourth" tenants. (Figures 13 and 14.) The relatively small number of cash tenants in the State are found principally in the extensive livestock-grazing areas, in which a large acreage is operated per person. (Figure 20.) Croppers, on the other hand, are found largely in the eastern cotton-producing areas in which the acreage per worker is relatively small. Other tenants occupy an intermediate position between these two in respect to acreage operated per person and are found largely in the large-scale cotton areas in the western part of the State as well as in the eastern cotton sections. Owner-operation is most common in the ranching areas; in the large-scale cotton, rice, and wheat areas in which the acreage and production per person are relatively large; and in the specialized truck and fruit areas in which a high degree of skill in operation is required.

A share cropper (or "half-hand") in the cotton areas in Texas usually furnishes all of the labor and one-half of the expenses for fertilizer, poison,



ure 13.—Percentage of all farm land
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(U. S. Census.)

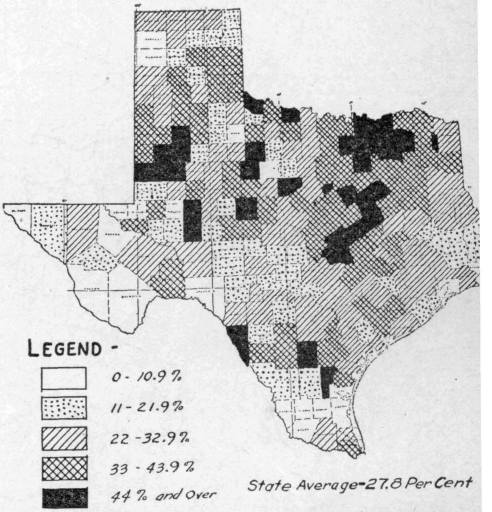


Figure 14.—Percentage of all farm land operated by tenants other than croppers, by counties, Texas, 1929. (U. S. Census.)

and ginning in return for one-half of the crops he produces. A crop-share tenant in these areas usually receives two-thirds of the feed crops and three-fourths of the cotton lint and seed produced by him, and furnishes the labor, workstock and equipment, seed, and three-fourths of the operating expenses such as fertilizer, poison, and ginning. In the wheat areas, the prevailing practice is for the tenant to receive two-thirds of the wheat and other crops produced and to furnish the labor, workstock and equipment, seed, and materials used in crop production. Share croppers approximate wage hands and are usually closely directed and supervised, whereas share tenants, particularly in the western part of the State, approximate more nearly the status of independent operators. However, there are wide variations.

The proportion of farms and of farm land operated by share tenants and croppers is highest in the better farming areas in which cotton production predominates. In the Black Waxy Prairie, one of the areas most intensively cropped to cotton and one in which relatively high yields are obtained, the percentage of tenancy in 17 of the 24 counties in the area ranges from 70 to 80 per cent. This high percentage of tenancy in the better farming areas is related to the productivity of the land and to the system of farming followed. Land that is so productive of income as to yield a surplus over operating and living expenses permits the accumulation by the thriftier and more successful farmers of additional land, or presents desirable opportunities for investment. The planting of an intensive crop such as cotton may necessitate the hiring of labor. Whether this labor be employed on a share or on a cash-wage basis is determined in part by sociological factors such as custom, tradition, and type of people hired, but more largely by economic considerations bearing on the mutual interests of employer and employee.

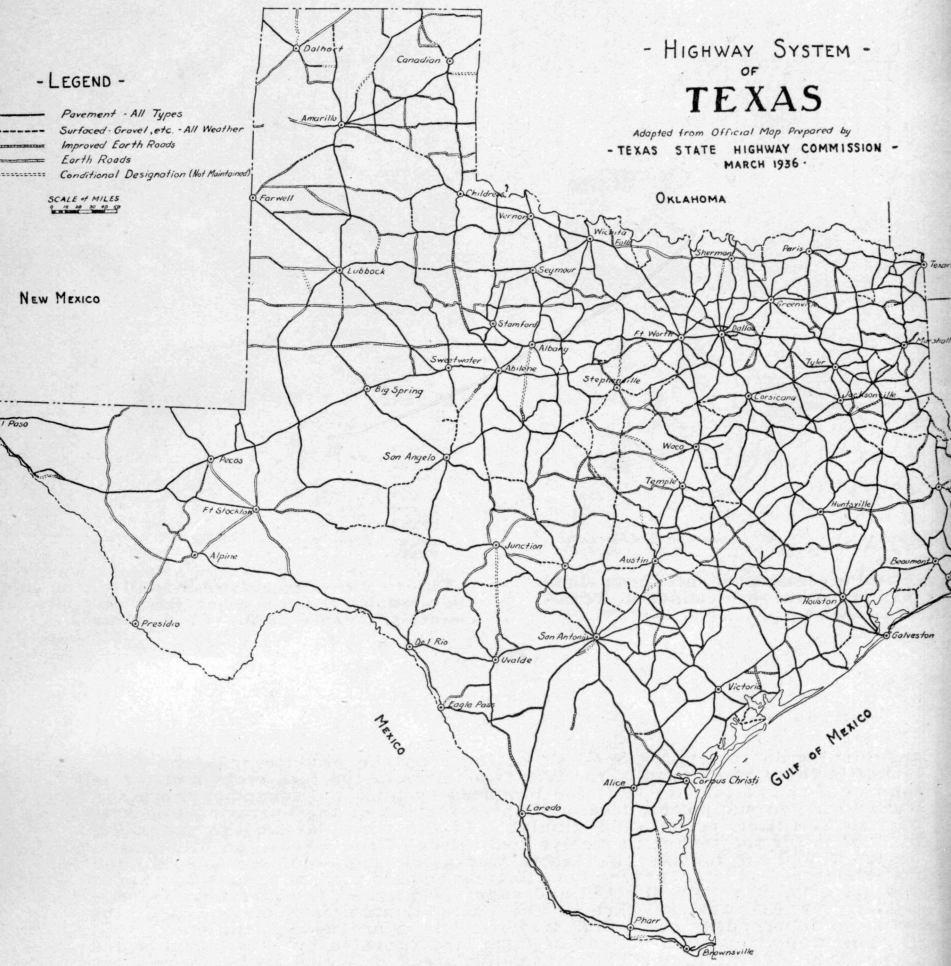


Figure 15.—Texas has an extensive highway system that is under constant improvement. Many "country roads" that connect farms with markets exist in addition to the State and Federal highways shown in the map. Of the total number of 495,489 farms in Texas in 1930, 5 per cent were located on hard-surfaced roads, 13 per cent on gravel or sand-clay roads, 41 per cent on improved dirt roads, and 41 per cent on unimproved dirt and other roads. The construction of improved roads and the development of rapid transportation facilities have been important factors influencing the kinds and amounts of agricultural production in the various areas in Texas.

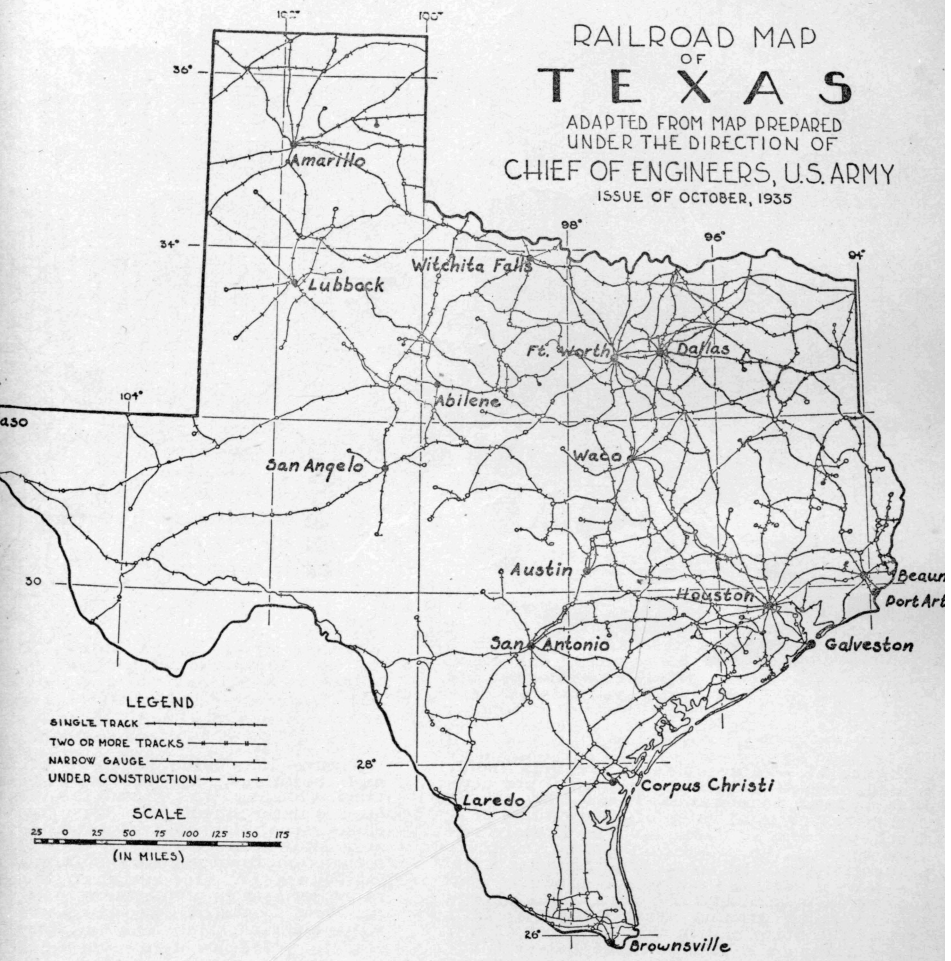


Figure 16.—The first railroad in Texas was built in 1851-1854 and extended from Harrisburg west to Stafford, a distance of 20 miles. In 1934, a total of 16,398 miles of railroad, exclusive of sidings and yard track, was reported to the Railroad Commission of Texas. The construction of railroads into the interior of Texas facilitated rapid settlement beyond the limited reaches of inland water transportation and brought the vast agricultural resources of the State into contact with the markets of the United States and of the world.

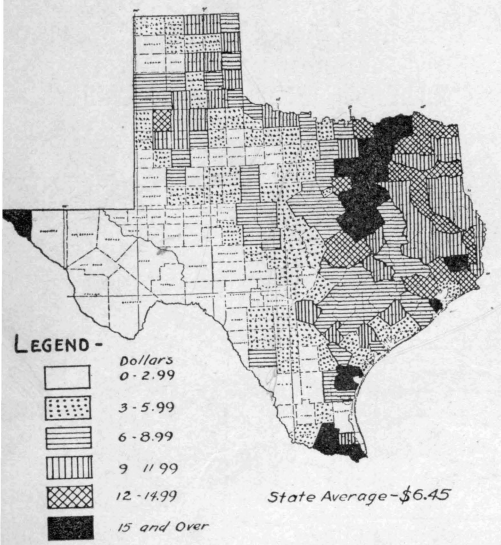


Figure 17.—**Value of farm products (sold, traded, or used by operator's family) per acre of farm land, by counties, Texas, 1929.** (U. S. Census.) The total value of all products produced per acre of farm land is directly related both to the utilization and to the total productivity of the land. The counties with the lowest average value of products per acre of farm land in 1929 were in the extensive livestock grazing areas in the western part of the State and in the Gulf Coast Area. The differences in the average per-acre returns obtained in these counties was largely a reflection of differences in the carrying capacities of the native pastures, and in the proportions of the land area in crops. (Figures 57 and 26.) The highest average per-acre values of farm products were in the intensively cropped areas such as the Black Waxy Prairie, the Corpus Christi Area, and the irrigated sections, in which yields, production, and values are relatively high.

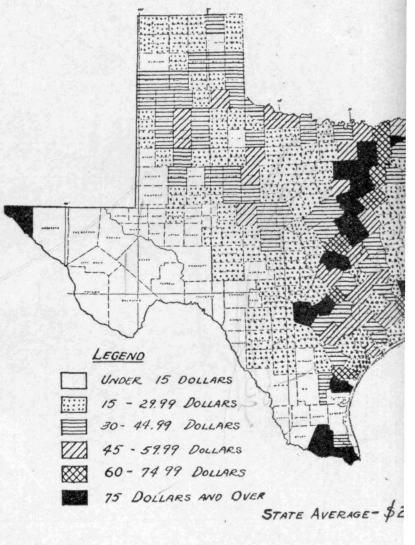
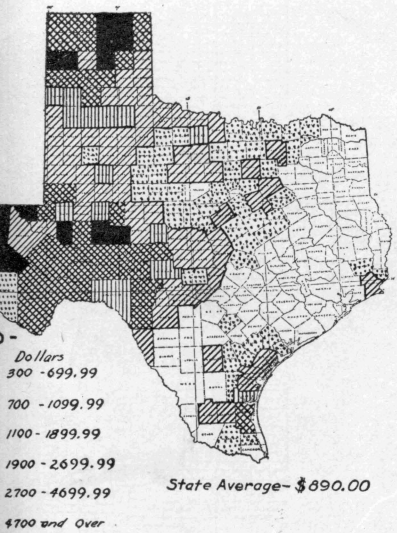


Figure 18.—**Value per acre of far and buildings, by counties, Texas** (U. S. Census.) In general, the value land is determined by its earnings. N close association of average land val acre shown in this chart with the returns obtained per acre of farm land in Figure 17. In much of the ex ranching area in which the returns fro products averaged less than $3 per a value of farm land and buildings a less than $15 per acre. On the othe in many counties in the better areas in which the total value o products averaged $15 or more per a value of farm land and buildings a $75 or more per acre.



e 19.—**Value of all farm products**
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e reverse of that shown in Figure 17
when farm earnings are expressed on
orker instead of a per-acre basis.
it was shown that the highest per-
urns from farm products are ob-
the eastern part and in the irrigated
of Texas, the returns per agricul-
rker in the western dry-farming and
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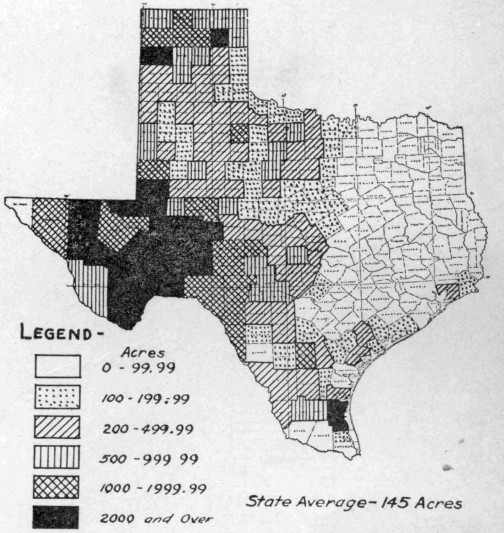

Figure 20.—**Number of acres of crop and pasture land operated per person 10 years old and older gainfully employed in agriculture, by counties, Texas, 1929.** (U. S. Census.) As stated in the discussion of Figure 19, the low average returns per acre of farm land in the livestock-grazing and western dry-farming areas are so offset by the large acreage operated per person as to result in a higher average income per worker in these areas than in the eastern crop-farming areas of the State. The striking differences in the acreages of farm land operated per person in the eastern and western parts of the State are shown in the above figure. With the exception of the Gulf Coast Area, in which livestock grazing and rice production predominate, less than 100 acres of farm land are operated per worker in the eastern part of the State. The extreme contrast to this is in the extensive-grazing areas in the western part of the State, in which more than 2,000 acres, ranging up to more than 10,000 acres, are operated by one person with seasonal help. Intermediate to this are the farm units in the sub-humid areas of the State in which large-scale farming is practiced. The causes of these differences in the acreages of farm land operated per person and the resulting effect on average sizes of farms in the various parts of the State are explained in the discussion of Figure 21.

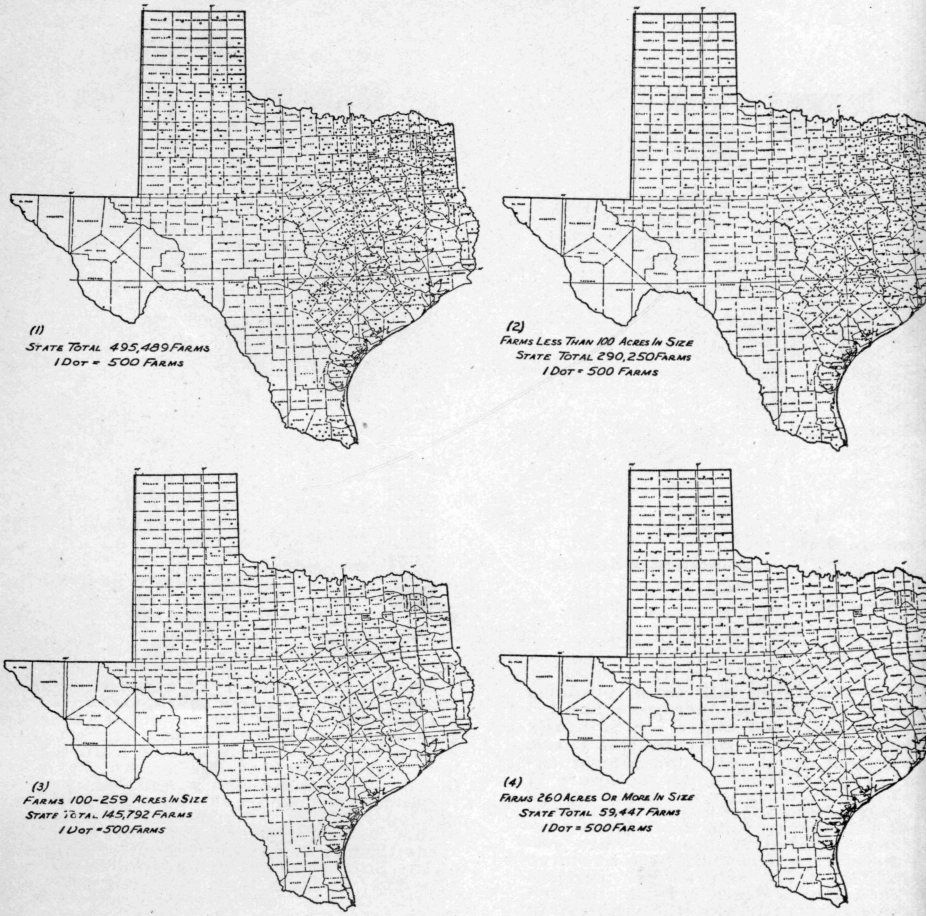

Figure 21.—Geographic distribution of all farms, and of farms according to size measured in acres, Texas, 1930. (U. S. Census.) On the basis of the Census Bureau policy of classifying the land operated by each tenant and cropper ("half-hand") family as a separate farm, Texas is predominantly a small-farm State. Approximately 59 per cent of all the farms in the State in 1930 were less than 100 acres in size, 29 per cent ranged from 100 to 259 acres, and 12 per cent were more than 259 acres in size. Livestock ranches are included in these data. The relative frequency of different-sized farms in the various parts of the State is determined by the general type of land utilization and of farming followed (i.e., forestry, extensive livestock grazing, crop production, etc.) and by the number of acres that the average farm worker or farm family finds it possible and economical to operate under the production conditions in each area. (Figure 19.) The farms in the eastern part of the State are predominantly small because of the large amount of labor required to produce an acre of cotton, the principal crop grown. (Section (2) above.) This in turn is caused by the abundant weed growth resulting from the heavy rainfall and, in part, by the physical difficulties of using large-scale machinery. These conditions become less pronounced in the central and western parts of the State, in which intermediate-sized farms of 100-259 acres predominate. (Section (3) above.) Large farms are most numerous in the western part of the State in which the low rainfall and consequent small weed growth necessitate very little hand labor in cultivation, and in which the level surface and easily tilled soil of much of the crop land permits the fullest use of large-scale machinery. (Section (4) above.) The largest operating units are in the extensive-livestock-grazing areas, in which individual ranches often comprise thousands of acres.

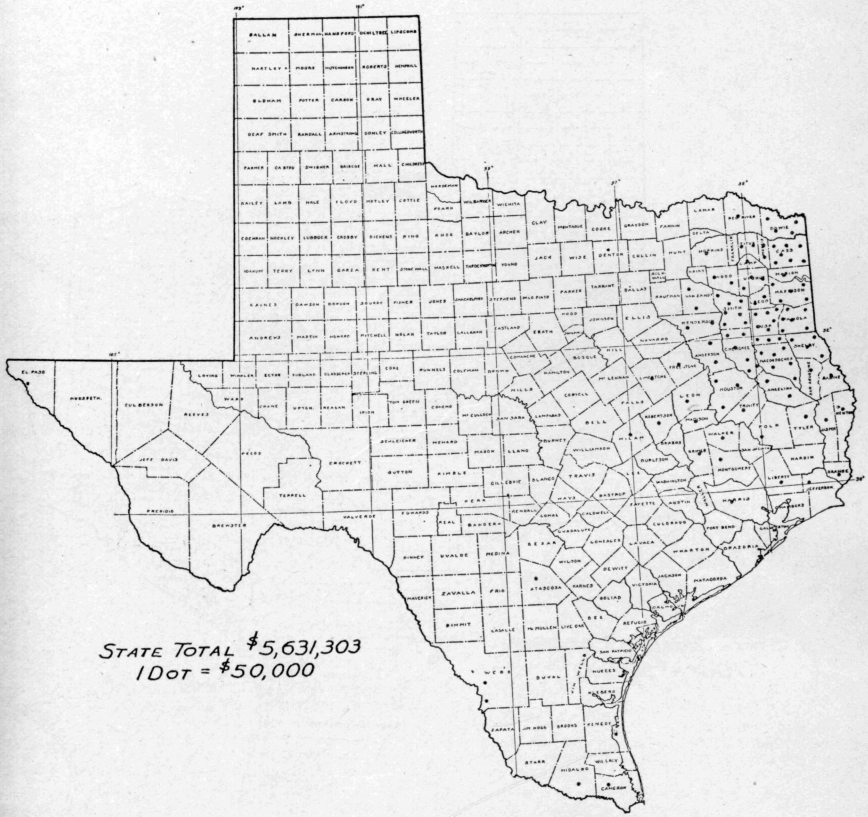

Figure 22.—Farm expenditures for fertilizer in Texas, 1929. (U. S. Census.) Fertilizer is not used in significant quantities in Texas except in the eastern part of the State in which the average annual rainfall exceeds 38 to 40 inches, and in which the soils are of low natural fertility but respond well to fertilizer treatment. Fertilizer is not used in the remainder of the State either because of the natural fertility of the soil or because of the lack of response to fertilization. Limited amounts of fertilizer are used in the irrigated truck-crop areas.

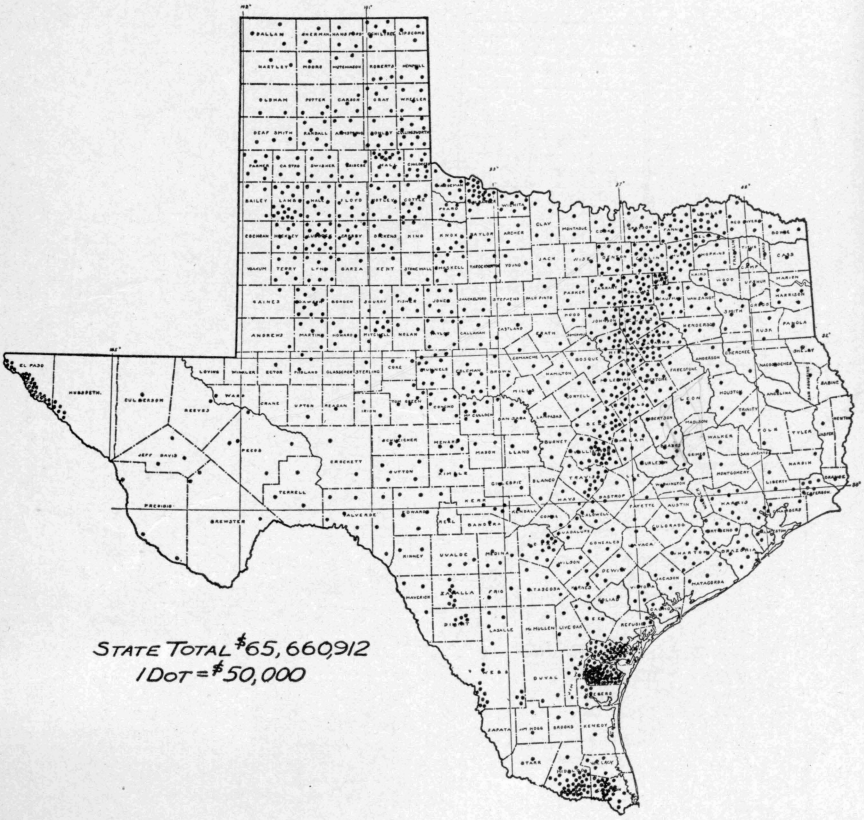

Figure 23.—**Cash expenditures for farm labor in Texas, 1929.** (U. S. Census.) Labor constitutes the largest cash item in the farmer's operating expenses in Texas. This cash expense would be increased tremendously, of course, if the housing facilities provided the laborers and the shares of farm products received by tenants and croppers for their labor were converted into cash equivalents. The areas with the largest cash expenditures for labor in Texas are the intensive cotton-producing areas and the irrigated areas. In both these groups of areas, the seasonal labor requirements of the crops grown are such that large amounts of labor additional to the regular farm force are needed periodically. In the major cotton areas, notably the Black Waxy Prairie, the Corpus Christi Area, and the High Plains and Rolling Plains Areas, one man usually grows a larger cotton acreage than he can harvest alone, and large amounts of labor, largely Negro and Mexican, are hired for this operation.

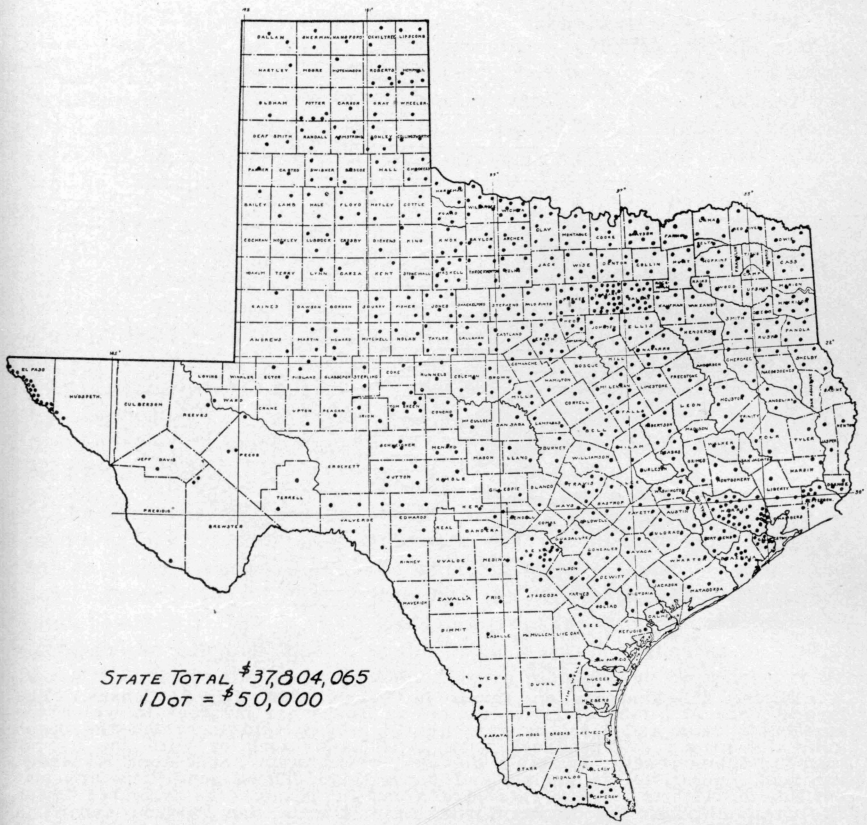

Figure 24.—**Farm expenditures for feed in Texas, 1929.** (U. S. Census.) The heaviest farm expenses for feed in Texas are in the areas adjacent to the larger cities. These purchases are made largely by specialized dairy, poultry, and truck farmers who dispose of their products locally and, to a lesser extent, by commercial feeders of livestock for slaughter. Other feed purchases are distributed rather generally throughout the State, with some tendency toward a concentration in the areas in which cash crops such as wheat, cotton, and truck crops occupy a major proportion of the cultivated land. It should be borne in mind that the data on farm feed expenses charted above pertain to feed purchased from neighboring farmers in the State as well as to feed purchased from out-of-State sources.

Figure 25.—Tractors on farms in Texas, 1930. (U. S. Census.) The largest concentrations of farm tractors in Texas are in areas in which the surface is open and level or only gently rolling, and in which the crops generally grown are produced with little hand work or with the use of seasonal labor readily available during periods when hand labor is needed for such operations as hoeing and harvesting. These conditions are met entirely or in part in six extensive areas in Texas: the irrigated lower Rio Grande Valley; the Corpus Christi Area (Nueces, San Patricio, and parts of Jim Wells and Kleberg Counties); the Gulf Coast Area northeast of San Patricio County; the specialized wheat area in the northern High Plains Area; the cotton-grain sorghum areas in the southern High Plains and in the Rolling Plains; and the Black Waxy Prairie. For representative groups of counties in each of these areas, the number of tractors per 10,000 acres in crop land in 1929 were 66, 33, 23, 21, 9, and 8, respectively.

The number of tractors per unit of crop land is not entirely representative of the relative importance of tractor use in different areas, because of the differences in the acreage handled per machine or per horse in the different parts of the State. When the rough measure of one tractor being equal to six horses is used as the basis for estimating the proportion of the farm power furnished by tractors, the relative order of the areas as given above is changed. On this basis, the specialized wheat area in the northern High Plains ranked first, with an estimated 51 per cent of its crop land operated with tractors in 1929. The other areas and the estimated proportion of their crop land worked with tractors in 1929 were the irrigated lower Rio Grande Valley, 39 per cent; the Corpus Christi Area, 36 per cent; the Gulf Coast Area, 15 per cent; the southern High Plains and Rolling Plains cotton-grain sorghum areas, 14 per cent; and the Black Waxy Prairie Area, 9 per cent. Some of the considerations affecting the use of tractor power and large field machinery in the various parts of the State are discussed in connection with the description of individual areas beginning on page 74.

Although horses and mules are by far the most important source of motive power on farms in Texas, these data indicate the large use that is being made of tractors in areas in which physical and other conditions favor their adoption. Information obtained from studies and observations indicates a sharp increase in tractors, particularly in 1935, following the curtailed feed supplies and relatively high feed prices caused by the widespread drought in 1934.

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LAND UTILIZATION AND CROP DISTRIBUTION IN TEXAS

The 34,766,166 acres of crop land in Texas in 1929 comprised 21 per cent of the total land area of 167,934,720 acres in the State and 28 per cent of the 124,707,130 acres included in the 495,489 farms operated that year. The remainder of the land in farms was used primarily for pasture. The 43,227,590 acres in the State not in farms were in forest land owned mostly by lumber interests and located principally in the southeastern part of the State; in a limited amount of waste land and land either not reported to census enumerators or not privately appropriated into farms; and in land in cities, roads, rivers, etc.

The use of land is determined by the pressure of economic and human forces and by the physical nature of the land itself. The geographic aspects in Texas of certain of the major elements in these two groups of factors are presented and discussed in the two preceding sections. As already noted, economic, social, and biological factors change rapidly and differ in their effect on the use made of land at one period as compared with another. In Texas, the net result of the operation of these factors has been chiefly in the direction of shifting the agricultural use of land from extensive livestock grazing to crop production and of clearing woodland for cultivation.

The charts in this section pertain to the general subdivisions of the land area of Texas into crop land, woodland, and pasture in 1929, and to the geographic distribution of the acreages in the major crops grown that year. Figures 26, 27, and 28 illustrate the distribution of the total crop land, the relative values of the principal crops in 1929, and the long-time trend in the number of acres in the principal crops. Figures 29 and 30 serve to indicate the areas in which future increases in crop acreage are most likely to occur. Figures 31 and 32 pertain to the total pasture land and to the kinds of native grasses and other vegetation found in different parts of the State. The extent of various dominant types of tree covering is shown in Figure 33, and the location and extent of irrigated areas in Figure 34. Figures 35 to 43, inclusive, portray the distribution of the principal crops grown in the State.

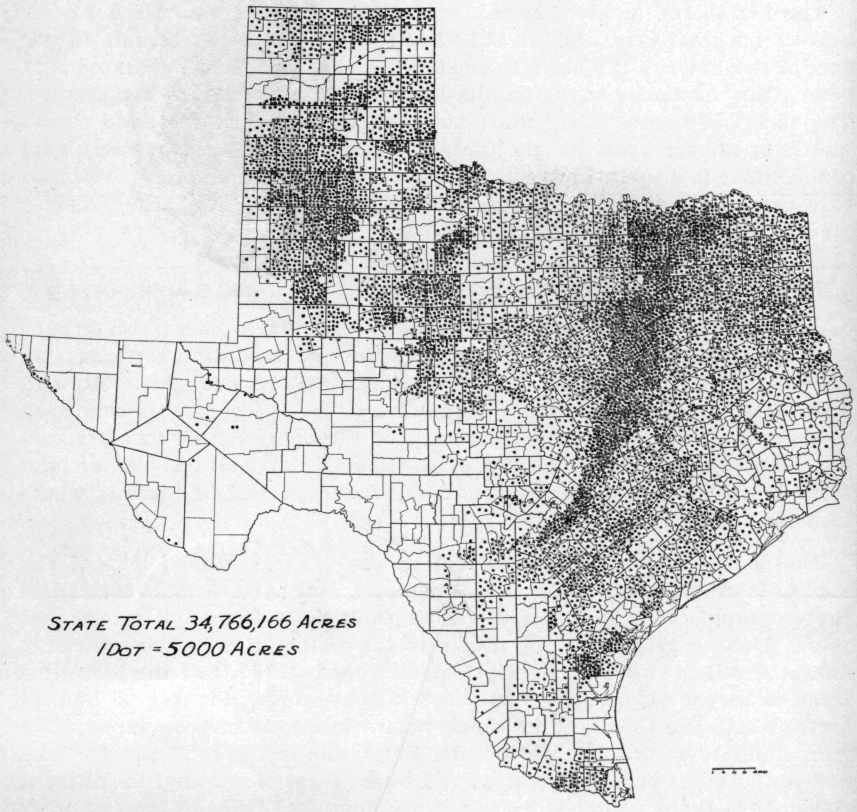


Figure 26.—**Acreage of crop land in Texas, 1929.** (U. S. Census.) The largest concentrations of crop acreage are in the areas in which land adapted to intensive crop production could be put into and maintained in cultivation at the least cost, i. e., with little or no clearing, drainage, or irrigation. Note the large concentrations of crop acreage, for example, in the Black Waxy Prairies, the Corpus Christi Area, the more level areas in the Rolling Plains, and the parts of the High Plains north and south of the Canadian River. Many parts of these areas were plowed without any preliminary work of clearing. In 1929, these areas contained approximately 54 per cent of the total crop acreage in the State. A considerable addition could be made to the crop land in the State through the drainage of wet lands and the utilization of tillable pastures, as discussed in connection with Figures 29 and 30. There are available no basic estimates of the amount of additional land that could be put into crop production through irrigation.

With the exception of relatively small irrigated sections, a vast area in the semi-arid and arid southwestern part of the State is devoted almost exclusively to grazing. The dotted line in Figure 4 indicates the present approximate western limit of systematic dry farming. Extensive grazing areas are also found in the Edwards Plateau, in the Rio Grande Plains in the southern part of the State, on the rougher phases of the land lying east of the High Plains to the Black Waxy Prairie, and in the Canadian River bottoms. The greater proportion of the land in these areas is so rough and broken as to make impossible the economical production of crops at present. Considerable grazing is also done on the Gulf Coast prairies in areas in which crop production usually is not possible without drainage.

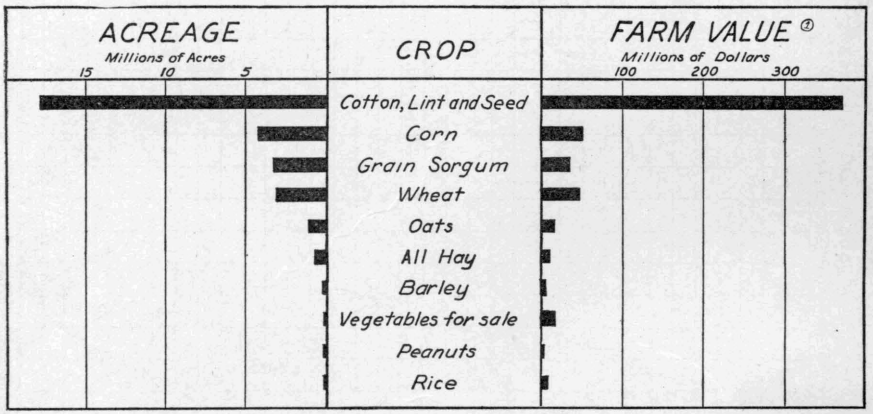


Figure 27.—**Harvested acreages and farm values of the principal crops in Texas, 1929.** (Data on vegetables for sale from U. S. Census of 1930; all other data from Bureau of Agricultural Economics.) Cotton is by far the leading crop in Texas, in terms both of the acreage occupied and of the returns obtained. In 1929, cotton occupied approximately 55 per cent of the harvested crop land in the State. The combined acreages of the next four most important crops that year—corn, grain sorghum, wheat, and oats—amounted to 71 per cent of the acreage in cotton, whereas the combined farm values of these four crops amounted to only 41 per cent of the value of cotton and cottonseed. During the 10-year period 1924-1933, the cash income from cotton and cottonseed in Texas amounted to 61 per cent of the cash returns from all crops and 247 per cent of the cash returns from livestock. (For relative numbers and farm values of livestock, see Figure 44.) During the 10-year period 1921-1930, an average of 32 per cent of the United States cotton crop was produced in Texas.

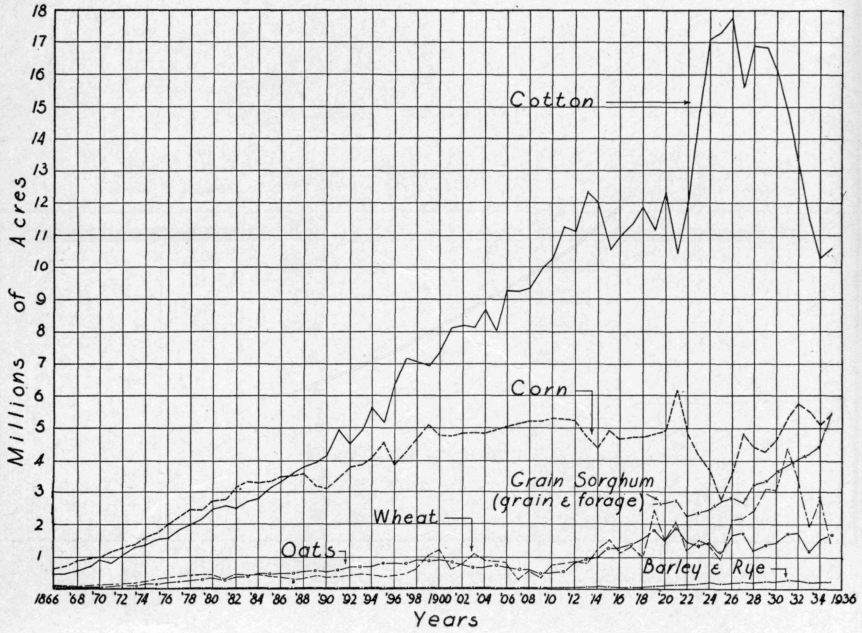


Figure 28.—**Acres in cotton, corn, grain sorghums, wheat, oats, and barley and rye in Texas, 1866-1935.** (Bureau of Agricultural Economics, U. S. Department of Agriculture.) The area in the leading cash and cultivated feed crops in Texas increased from 1,291,000 acres in 1866 to 30,746,000 acres in 1931, an average increase of 453,154 acres annually. This rapid increase in crop acreage was closely associated with the extension of transportation facilities into the interior of the State. (See Table 1.) Cotton acreage increased much more rapidly than the acreage in other crops. The acreages in cotton and corn increased approximately at the same rate until 1887, with the acreage in corn slightly more than that in cotton. With increased specialization in cotton production, particularly in the Black Waxy Prairie, and with the expansion of production into the western and southern parts of the State, the acreage in cotton soon outstripped that in other crops. In 1926, the peak cotton year, the acreage in cotton was 62 per cent higher than the combined acreages in the other crops shown in the chart. After 1930 and 1931, the acreages in cotton and wheat decreased abruptly under the pressure of low prices and as a result of the adjustment programs of the Agricultural Adjustment Administration. On the other hand, increases occurred in the acreages in corn, grain sorghums, and other crops used primarily for feed and food.

Note the rapid increase in grain sorghum acreage since 1919, the first year for which annual data are available. Grain sorghums are the chief feed crop in the western and southern parts of the State in which the average annual rainfall is less than 25 inches. (See Figure 37.)

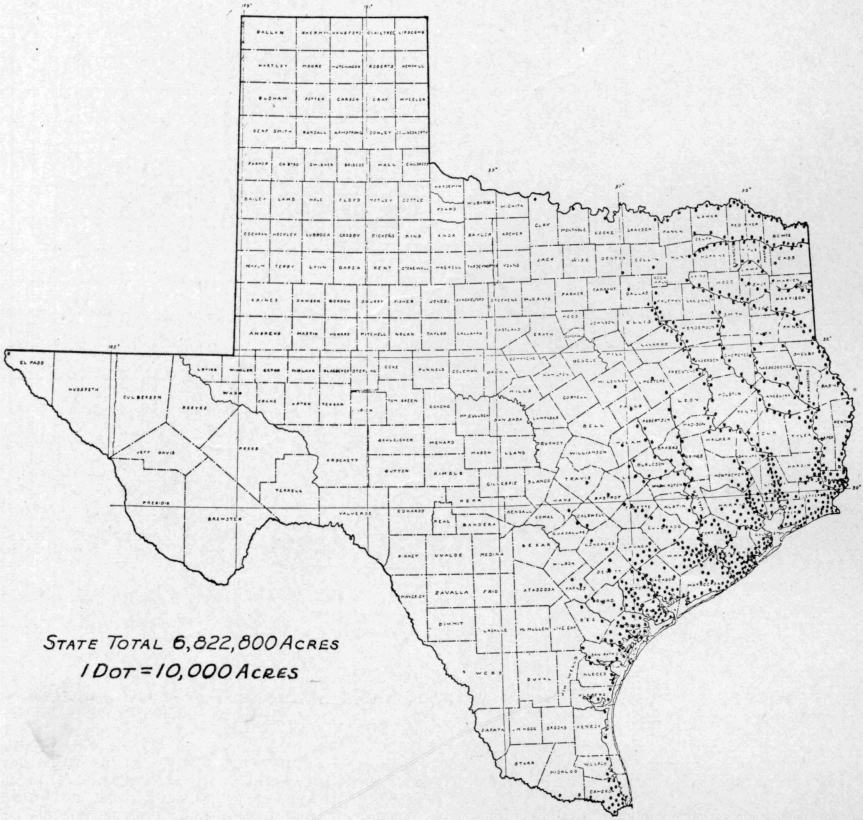


Figure 29.—**Wet lands in Texas that are cultivable if drained, 1919.** Although recent estimates on this are not available, there were approximately 6,823,000 acres of drainable wet land in Texas in 1919. Some of this land has been brought into cultivation since 1919, but the bulk of it still constitutes potential crop acreage that may be farmed when demand conditions justify. Practically all of this wet land is in the river valleys and Gulf Coast prairies of eastern Texas. (Based upon data prepared by F. J. Marschner, Bureau of Agricultural Economics, and L. A. Jones, Bureau of Public Roads, U. S. Department of Agriculture.)

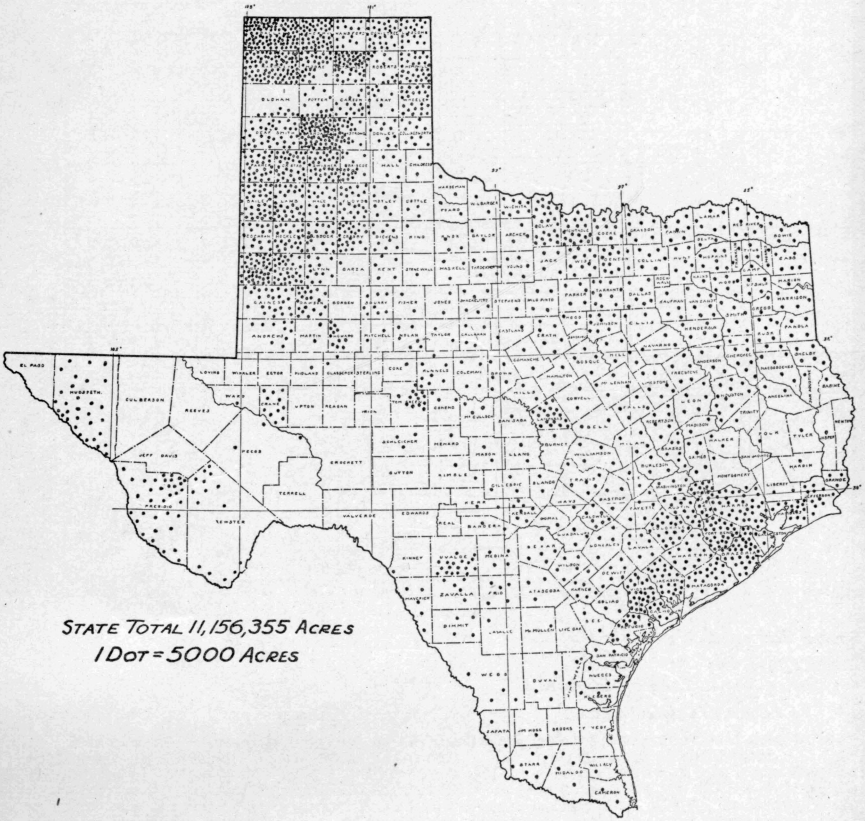


Figure 30.—**Plowable pasture in Texas, 1929.** (U. S. Census.) Approximately 11,156,000 acres of land in Texas farms in 1929 could have been plowed and used for crops without clearing, drainage, or irrigation. The areas with the largest acreages of such land are the wheat and cotton areas in the High Plains section of western Texas, the ranching-cotton-rice area in the Gulf Coast section, and a ranching-farming area in the north-central part of the State. Prior to the reduction program of the Agricultural Adjustment Administration, the trend in crop acreage in these areas was definitely upward, particularly in the High Plains section. Relatively high prices for farm products will probably cause this upward trend to be resumed at an accelerated rate.

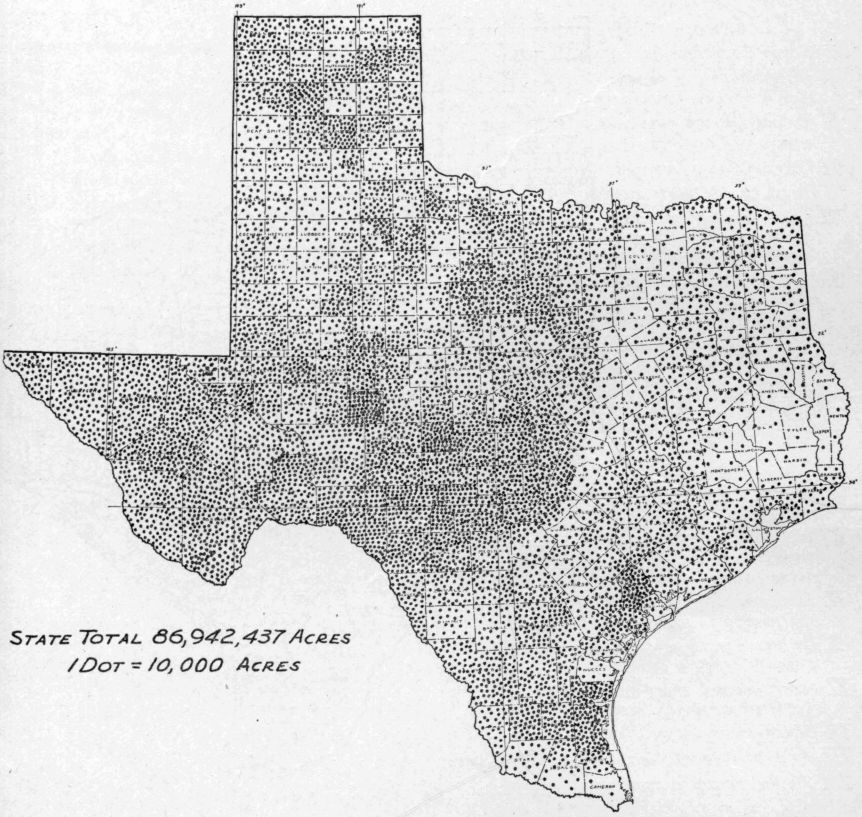


Figure 31.—**Total pasture land in Texas, 1929.** (U. S. Census.) Approximately 70 per cent of the total area in farms in Texas in 1929 was used for pasture. Of the area in pasture, approximately 13 per cent was classed as land that could be plowed without clearing, draining, or irrigating (Figure 30); 17 per cent as woodland pasture; and 70 per cent as other pasture. In 1929, the total area in pasture exceeded the total area in crop land by 150 per cent. This chart and Figure 26, together with Figure 46, serve to distinguish the predominantly farming areas from the areas in which livestock grazing is the leading enterprise. The distribution of cattle, sheep, and goats is not in direct proportion to the distribution of pasture acreage, of course, because of the wide differences in the kinds and character of native vegetation and the resulting wide differences in the carrying capacities of pastures in the different parts of the State. (Figures 32 and 57.)

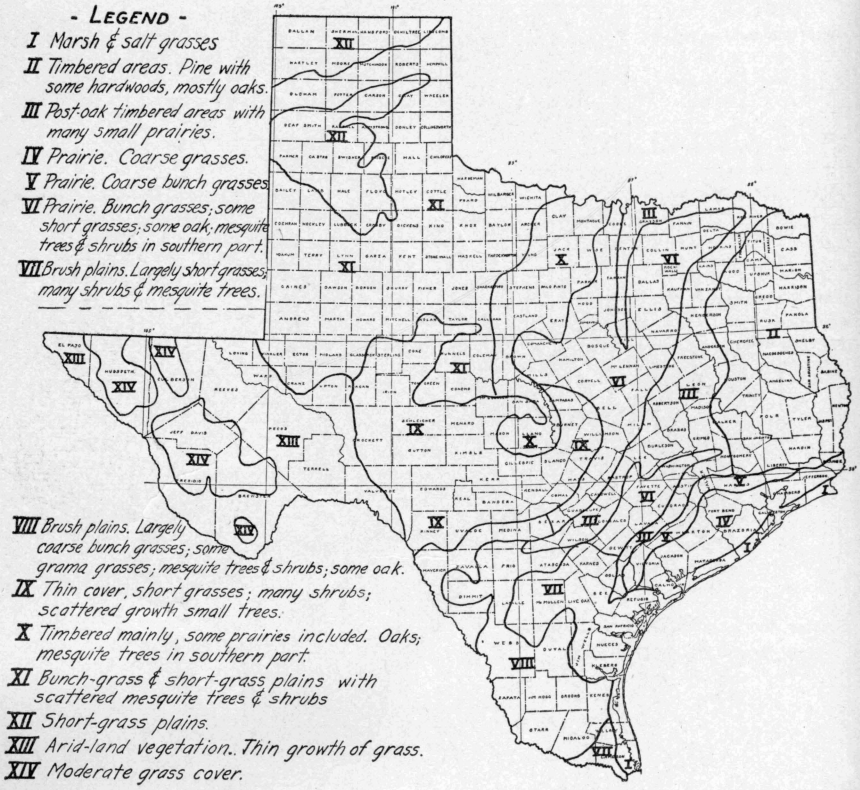


Figure 32.—**The native vegetation in Texas.** (Adapted from Texas Agricultural Experiment Station Bulletin No. 431, The Soils of Texas, by W. T. Carter.) Differences in native vegetation in the various parts of the State are closely associated with differences in soils and climate, as may be noted from a comparison of this map with Figures 1, 4, and 6. The type and character of growth of native vegetation influences the carrying capacity of native pastures (Figure 57) and also the cost and rapidity with which additional land may be brought into cultivation. The areas most rapidly developed for crop production in Texas have been those in which little or no clearing was necessary.

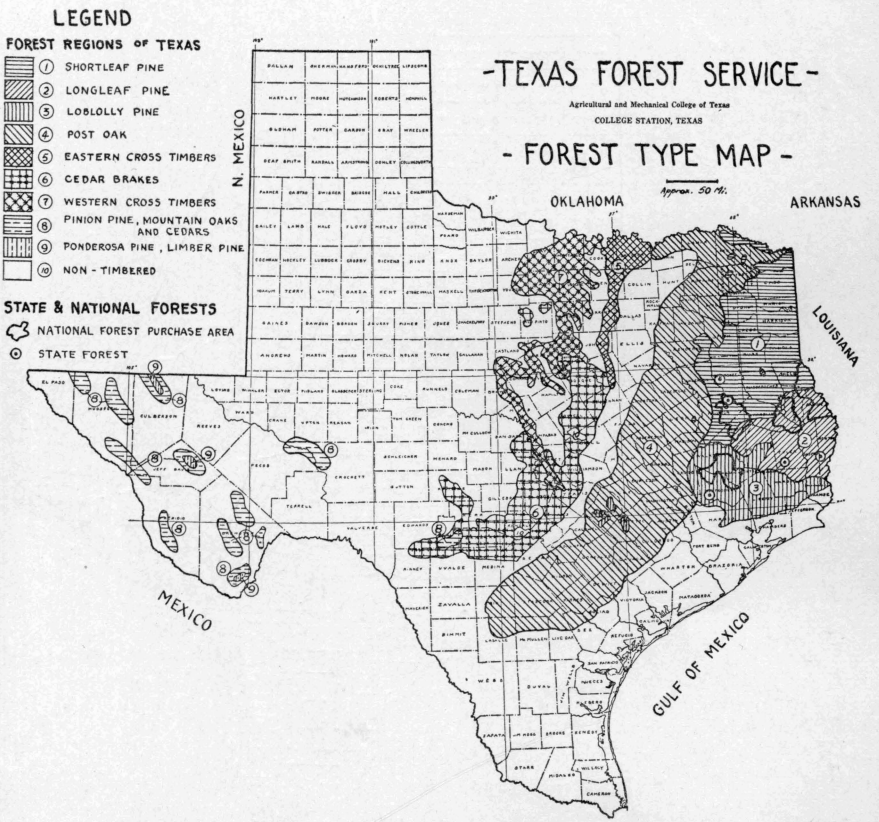


Figure 33.—The pine forests of eastern Texas are the most valuable timber resource in the State and furnish a basis for commercial lumbering operations as well as for a substantial portion of the farm income of that section. The forest types west of the pine area include post oak, cedar, and other areas of lesser importance. The forest region ends in the approximate zone in which the average annual rainfall ranges from 25 to 30 inches. (Figure 4.) It is estimated that the forest areas of Texas comprise approximately 9,422,000 acres.

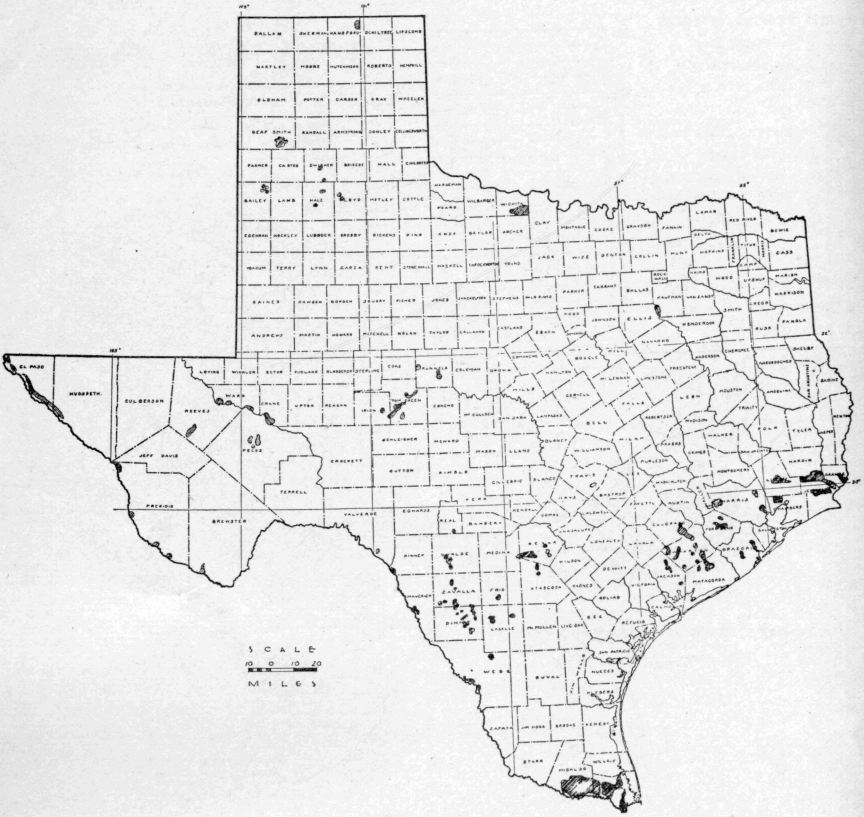


Figure 34.—Irrigated areas in Texas, 1929. (U. S. Census.) Aside from the irrigated rice area in the Gulf Coast section of southeastern Texas, the production of irrigated crops is largely confined to the sub-humid and arid parts of the State in which moisture deficiency is a problem. Approximately 798,917 acres of land were irrigated in Texas in 1929, with an estimated value of harvested products of $33,220,965. Listed in order of importance according to acreage harvested, the principal crops grown under irrigation in Texas in 1929 were cotton; rice; vegetables harvested for sale, principally cabbage, spinach, tomatoes, and dry onions; orchard crops, principally citrus; corn; hay crops, principally alfalfa; and sorghums for grain and forage.

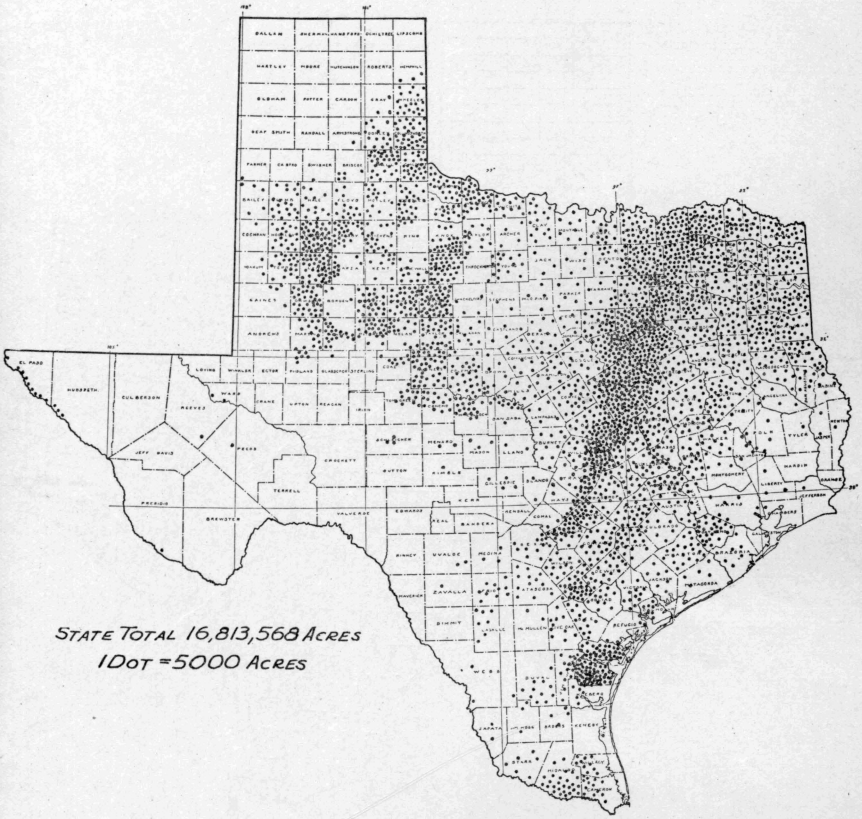


Figure 35.—**Cotton acreage harvested in Texas, 1929.** (U. S. Census.) Cotton production in Texas does not extend at present beyond the approximate limits of territory with a growing season of 190 days or more and, except under irrigation, with an annual rainfall of approximately 18 inches or more. (See Figure 6 for length-of-growing-season zones and Figure 4 for rainfall zones.) Within these limits, cotton acreage is distributed over the State roughly on the same basis as is crop land. (Figure 26.) The areas of heaviest concentration of cotton acreage are on the fertile soils of the Black Waxy Prairie and Corpus Christi Areas, and in the High Plains and Rolling Plains in which low-cost production methods are practiced. (Areas 14a, 14b, 14c, 10, 3, 4a, and 4c in Figure 55.)

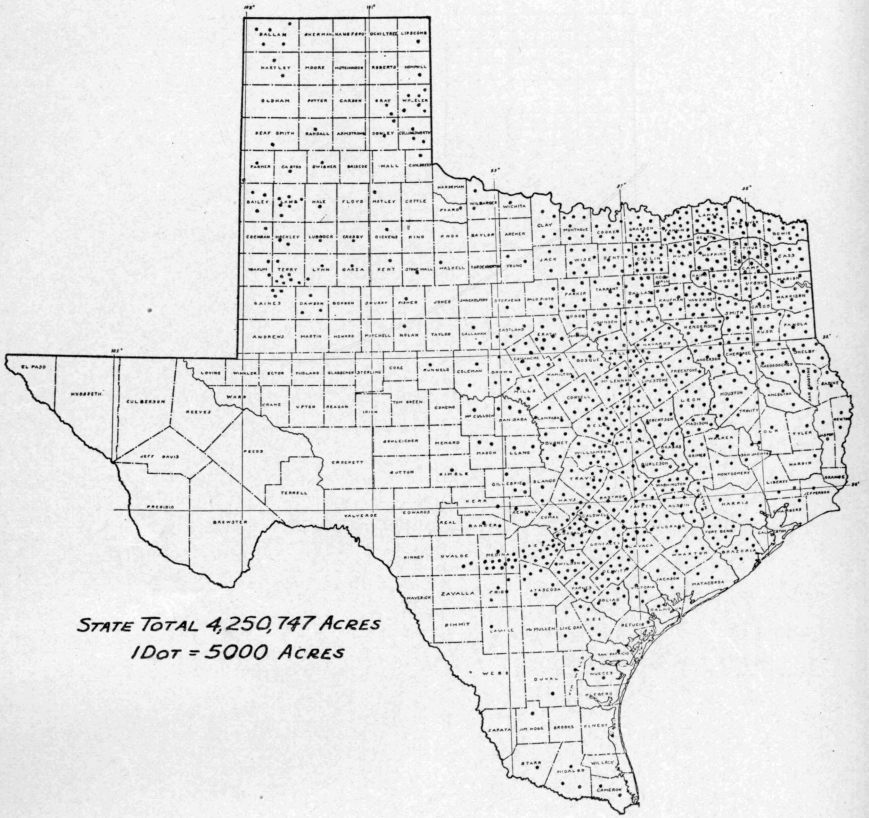


Figure 36.—**Total corn acreage in Texas, 1929.** (U. S. Census.) The 4,251,000 acres in corn in Texas in 1929 comprised approximately 14 per cent of the harvested crop land in the State. Corn requires plenty of moisture for satisfactory production. The bulk of the corn acreage in Texas is found in territory with an average annual rainfall of 25 inches or more. (Figure 4.)

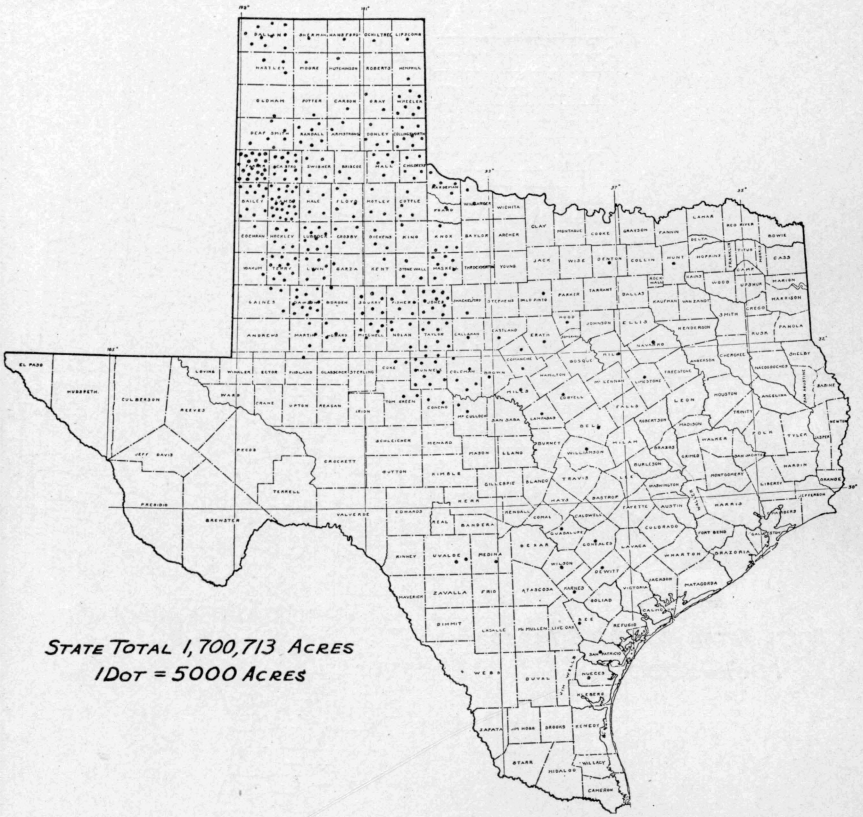


Figure 37.—**Sorghums harvested for grain in Texas, 1929.** (U. S. Census.) Grain sorghums are efficient users of moisture and constitute the main source of farm-produced feed grains in the farming areas in Texas in which the average annual rainfall is less than 25 inches. The 1,701,000 acres in sorghum harvested for grain in Texas in 1929 comprised approximately 6 per cent of the harvested crop land in the State.

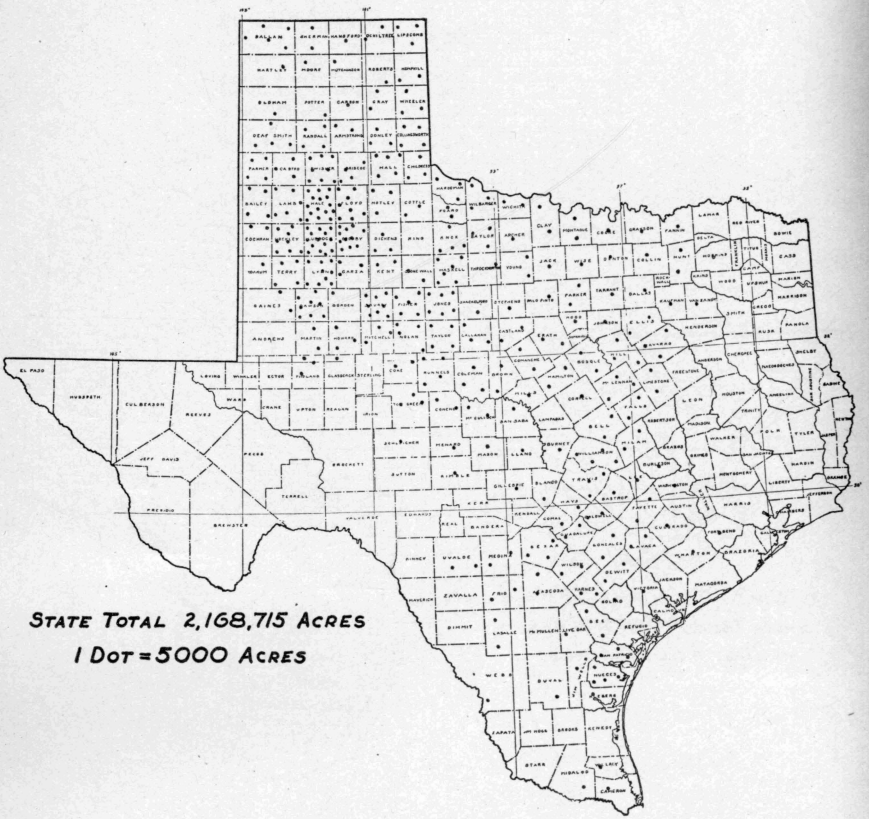


Figure 38.—**Sorghums harvested for silage, hay, or fodder in Texas, 1929.** (U. S. Census.) The sorghums are the principal forage crop in Texas. They are substituted for hay crops on the great majority of farms from the Black Prairie west. Sorghums harvested for silage, hay, or fodder occupied 2,169,000 acres or approximately 7 per cent of the harvested crop land in the State in 1929.

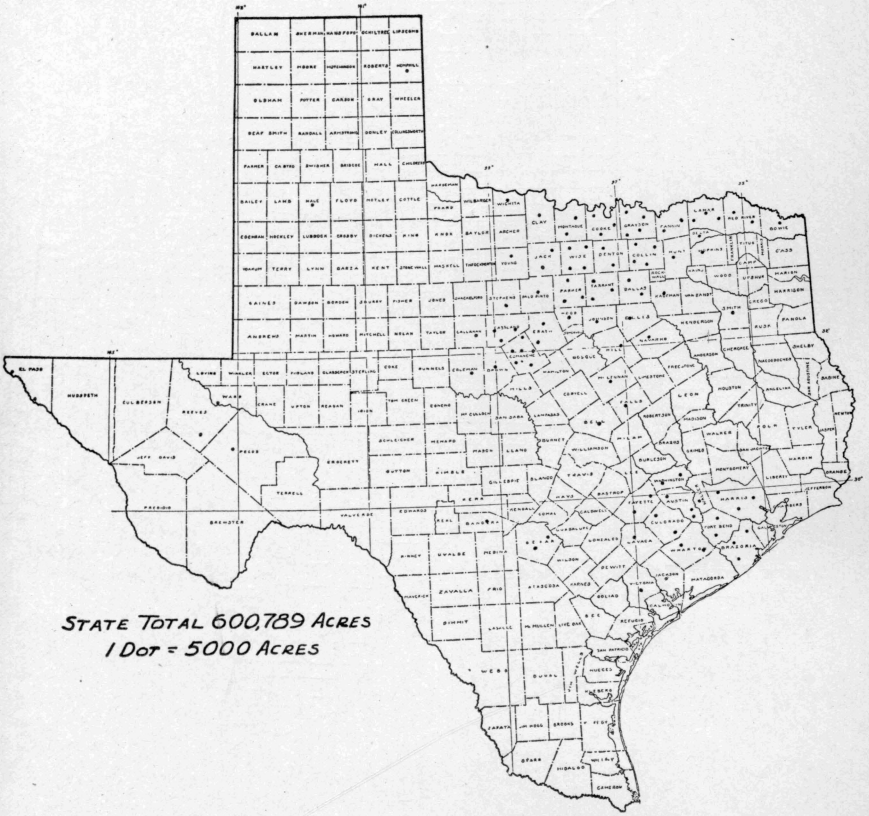


Figure 39.—**Acreage in hay crops in Texas, 1929.** (U. S. Census.) The acreage in hay crops in Texas is relatively small. The principal hay production areas in the State are in the Gulf Coast Area between Houston and Victoria and in north-central Texas. The principal hay crops harvested in the State in 1929 were, in order of extent of area, tame grasses, wild grasses, annual legumes, small grains, and alfalfa.

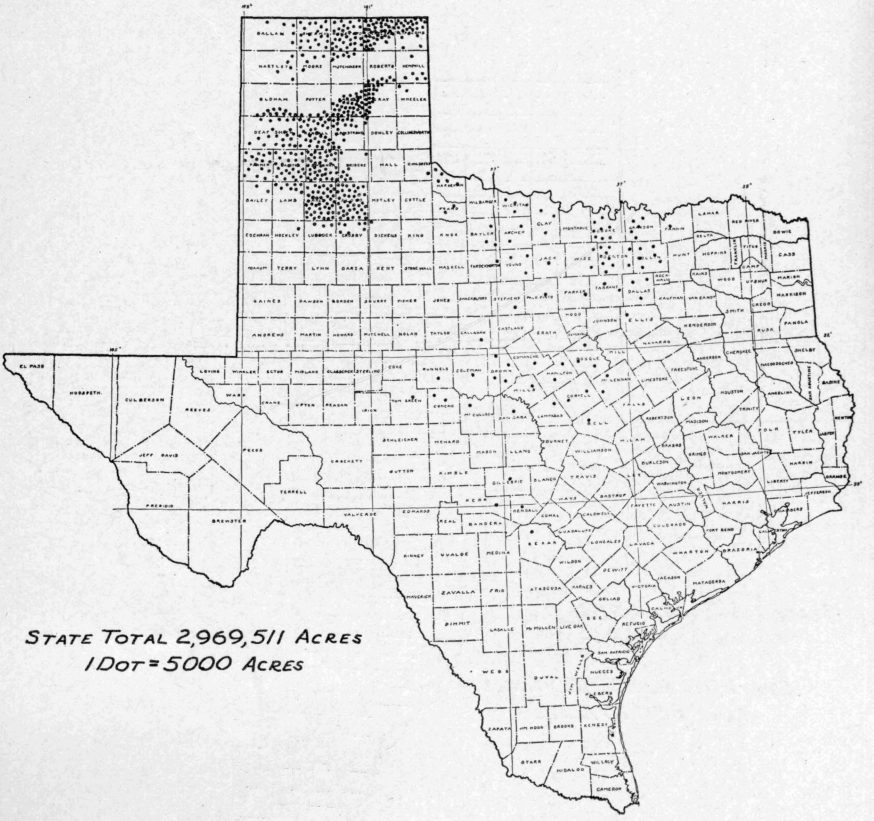


Figure 40.—**Acreage in wheat threshed in Texas, 1929.** (U. S. Census.) Wheat is the fourth most important crop in Texas in terms of acreage occupied and the third most important in terms of farm value. (Figure 27.) The 2,969,511 acres and 44,077,764 bushels harvested in the State in 1929 constituted approximately 5 and 6 per cent, respectively, of the United States totals. Wheat, associated with grain sorghums for feed, is the dominant commercial farm enterprise on the heavy, dark-colored soils in the northern part of the High Plains. (Figure 1.) Cotton, also associated with grain sorghums for feed, supplants wheat as the leading commercial farm enterprise on the sandier, reddish soils in the southern part of the High Plains and the Rolling Plains to the east, in which the length of growing season exceeds 190 days. (Figure 35.) Some wheat and other small grains are produced on heavier soils as far east as the eastern edge of the Black Waxy Prairie, with the southern limit of wheat production approximately at the line of 240 days or less in the growing season. (Figure 6.)

Figure 41.—**Acreage in oats harvested in Texas, 1929.** (U. S. Census.) Oats are the fifth most important crop in Texas in terms of acreage occupied and of farm value. (Figure 27.) In general, the production of oats and wheat is located in the same general territory, i. e., on the heavy soils in the northern part of the High Plains and on the heavier soils of north-central and central Texas as far east as the eastern edge of the Black Waxy Prairie. (Figure 1.) However, in northwestern Texas, the acreage in oats is relatively small compared with the wheat acreage; whereas the reverse holds true in the north-central and central part of the State. In the former area, wheat and grain sorghums are grown in preference to oats because of the greater returns from these crops under the low rainfall conditions that prevail. In north-central and central Texas, on the other hand, the heavier rainfall and longer growing season result in increased wheat-rust damage, and oats are of greater relative importance than wheat. A large proportion of the oats in north-central and central Texas is grown on the shallower, less fertile soils on which cotton yields are low compared with those on the deeper, more fertile soils in the area. The present southern limit of oat production in Texas is the zone in which the length of growing season is approximately 250 to 260 days. (Figure 6.)

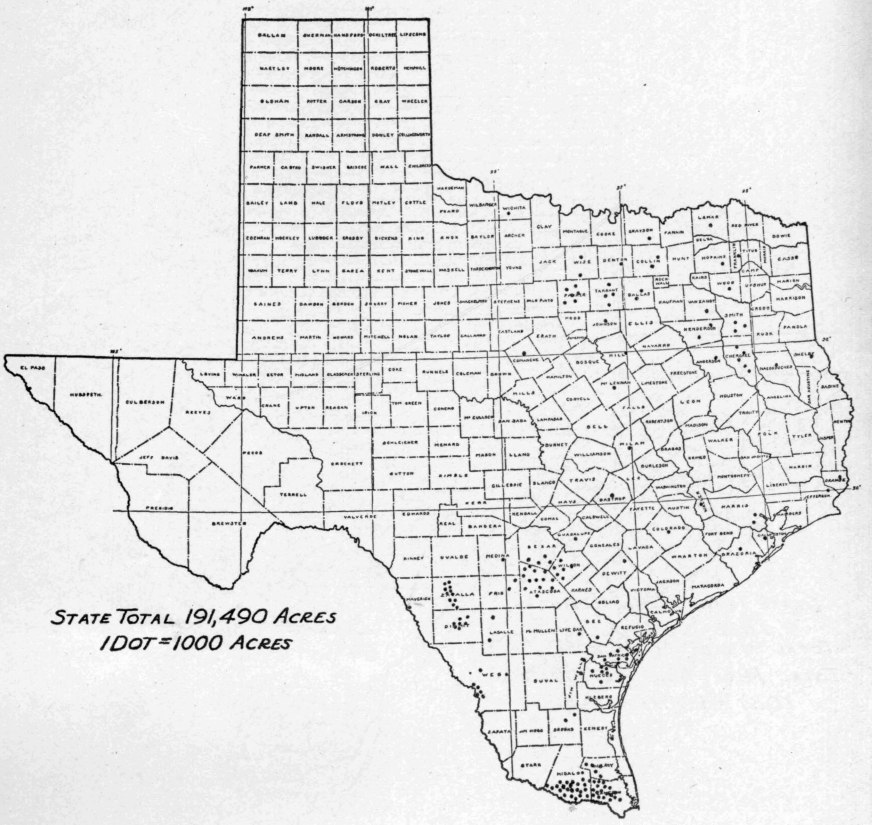


Figure 42.—Acreage in vegetables harvested for sale, Texas, 1929. (U. S. Census.) The value of vegetables harvested for sale in Texas in 1929 amounted to $14,125,151, or an average of almost $74.00 per acre. Listed in order of importance according to acreage occupied, the leading vegetable crops in the State in 1929 were watermelons, tomatoes, dry onions, cabbage, and spinach. There are six important commercial vegetable areas in the State: The mixed vegetable area in the lower Rio Grande Valley, mostly irrigated; the dry onion-spinach area in the Winter Gardens area in Zavalla, Dimmit, and Webb Counties, mostly irrigated; the watermelon-green corn area south of San Antonio, largely in Wilson, Atascosa, and Bexar Counties; the dry onion-cabbage area around Corpus Christi; the tomato and watermelon area in northeastern Texas; and the watermelon area in north-central Texas. Other areas of less importance are scattered throughout the eastern, humid part of the State, particularly near cities or large towns in which ready local markets for fresh vegetables are available.

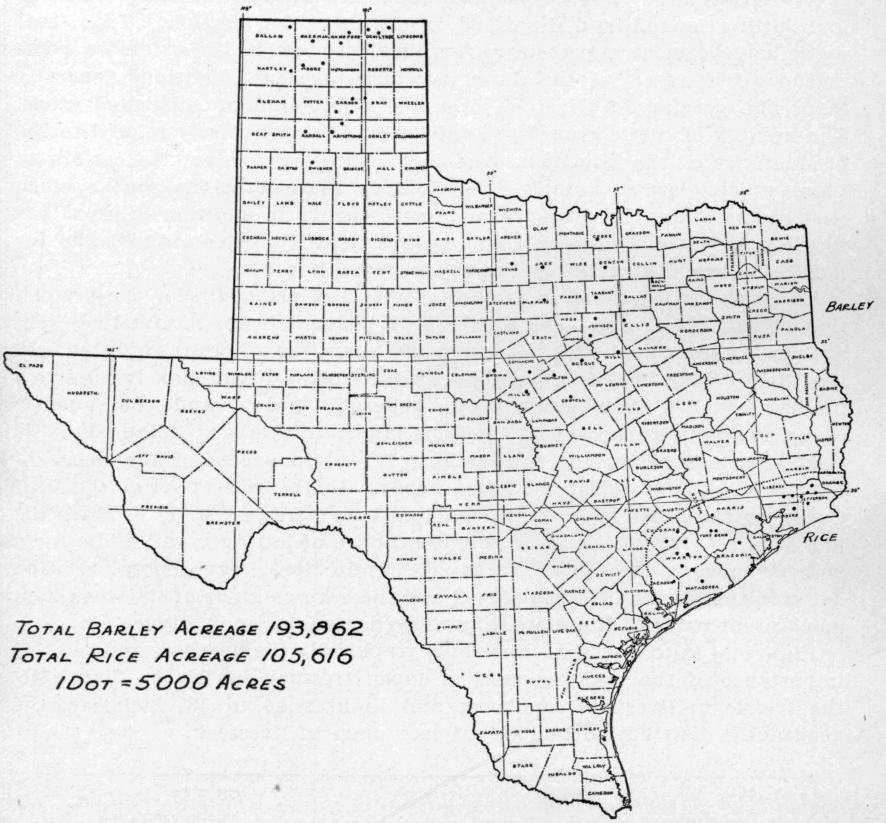


Figure 43.—**Barley and rice acreage harvested in Texas, 1929.** (U. S. Census.) Barley in Texas is found in the same general areas as are wheat and oats, i. e., on the relatively heavy soils of northwestern, north-central, and central Texas. (Figures 40, 41, and 1.) The area in barley is relatively unimportant compared with the acreages in wheat and oats.

During the 5-year period 1928-1932, approximately 21 per cent of the rice crop in the United States was produced in Texas. Rice production in Texas is confined to productive land in the level Gulf Coast section in which impervious subsoils and the ready availability of abundant water resources permit economical irrigation.

LIVESTOCK ENTERPRISES IN TEXAS

Commercial feeding of livestock is not widely practiced in Texas; hence the kinds and numbers of animals raised in different parts of the State are closely related to the types and quantities of feed resulting from the local utilization of land described in the preceding section. Thus, beef cattle are the most important agricultural product in the extensive areas in the western part of the State in which physical conditions generally favor the grazing of livestock over the production of cultivated crops. The number of cattle grazed per unit of land is also closely related to the productivity of the land measured in terms of pasturage. In certain of these grazing areas, notably the Edwards Plateau in the southwestern part of the State, the presence of browse shrubs in addition to grass has resulted in various grazing combinations of cattle, sheep, and goats for most effective utilization of the range vegetation.

Likewise, in the areas in which land is used primarily for the production of cultivated crops, the numbers of various classes of livestock kept are closely associated with the kinds and quantities of crops produced. In the Black Waxy Prairie Area, for example, cotton production is relatively more profitable than other crops generally grown and consequently occupies a high proportion of the farm land. In this area, relatively little land is available for the production of feed in excess of the needs of livestock kept for farm and home needs. In the rice areas of the Gulf Coast, on the other hand, many farmers keep herds of cattle to graze the idle land resulting from the common practice of letting land lie idle for a year or more following a year in rice production. The general relation between the kinds of feed produced and the various kinds of livestock kept in different parts of the State is portrayed graphically in Figure 58.

Figure 44 in this section illustrates graphically the numbers and relative importance of the major classes of farm livestock in Texas; Figure 45, the trends in livestock numbers; and Figures 46 to 53, inclusive, the geographic distribution in 1930 of each class of livestock.

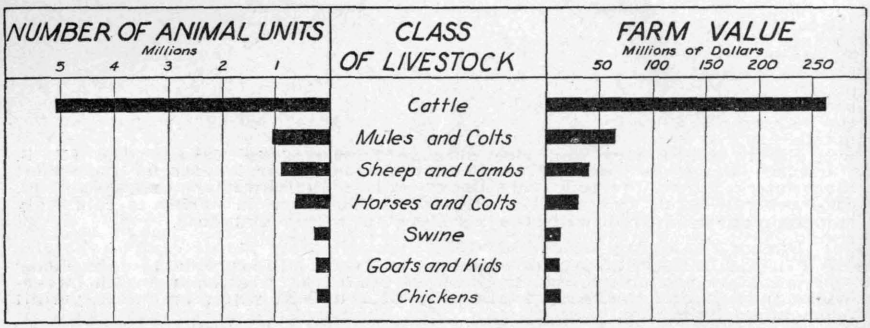


Figure 44.—**Number of animal units and value of principal classes of livestock in Texas, 1930.** (U. S. Census.) Expressed in terms of animal units as a common denominator, there were 33 per cent more cattle in Texas in 1930 than all the other classes of livestock combined. Normally, approximately 11 per cent of the cattle in the United States are in Texas. Cotton and cattle are the leading crop and livestock enterprises in the State. (See Figure 27 for relative acreages and values of crops.) In order of relative numbers, cattle were followed in importance by mules, sheep, horses, hogs, goats, and chickens. (In the conversions, an animal unit was considered equivalent to a mature horse or mule, two yearling colts, or four colts under one year; one cow, two yearlings, or four calves; seven sheep, nine yearling ewes, or 13 lambs; 12 goats and kids; four sows, five other hogs, or eight pigs; and 100 chickens.)

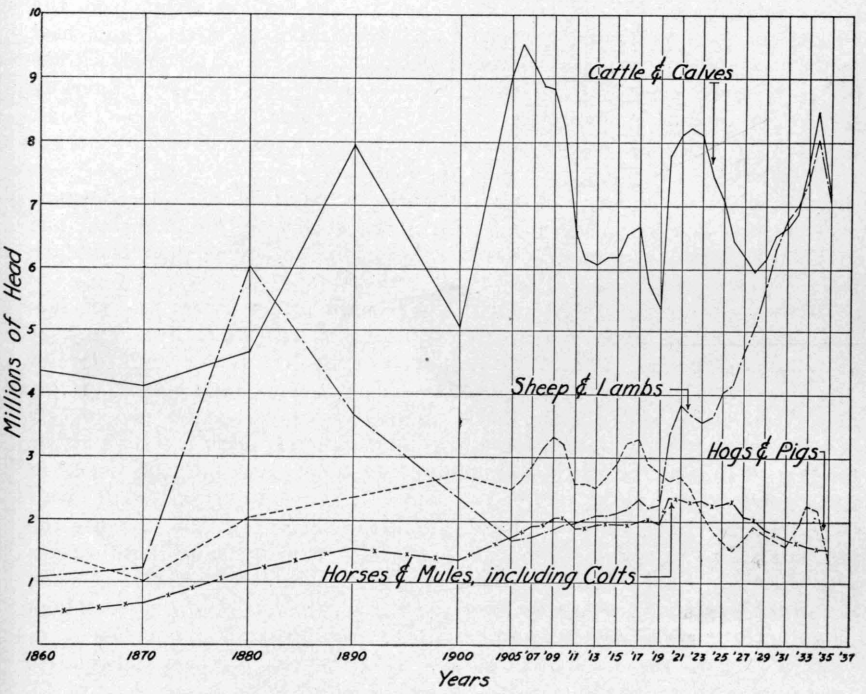


Figure 45.—**Numbers of principal classes of livestock in Texas, 1860-1935.** (U. S. Census, 1860-1900; Bureau of Agricultural Economics, 1905-1935.) The number of livestock in Texas tends to vary widely from one period to another. With the exception of sheep, the long-time trend in number of livestock was upward with the general agricultural development of the State. In the case of sheep, the upward trend in number was halted and a sharp reduction occurred following the low wool prices of the 1890's. Between 1890 and 1910, the important sheep industry in the Rio Grande Plains in southern Texas practically disappeared. The sharp increase in sheep that occurred after 1919 was chiefly in the Edwards Plateau in the southwestern part of the State.

Over shorter periods of time, variations or cycles occurred about the long-time trends in livestock numbers. These cycles varied in length for different classes of livestock according to the length of time required to mature and breed different species of animals, and occurred largely as a result of changes in the relative incomes from different adapted lines of agricultural production.

As a result of displacement by tractors, the number of horses and mules in the State has decreased steadily since 1926. (See Figure 25.) The sharp decline in numbers of cattle, sheep, and hogs in 1934 resulted largely from the drought emergency purchases of cattle and sheep by the government and from the hog adjustment program of the Agricultural Adjustment Administration.

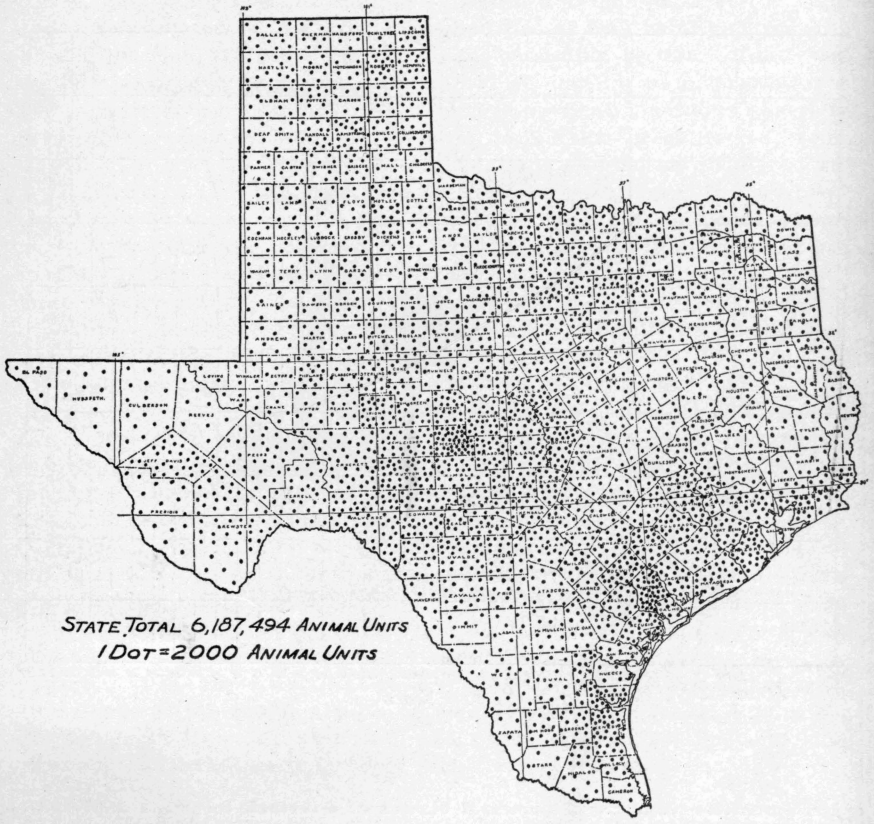


Figure 46.—Animal units of cattle, sheep, and goats in Texas, April 1, 1930. (U. S. Census.) Expressed in terms of animal units as a common denominator, cattle comprised 82 per cent of the total stock of cattle, sheep, and goats in Texas. Sheep comprised 14 per cent and goats 4 per cent. The areas of densest concentration of cattle, sheep, and goats in the State are the Edwards Plateau immediately to the southwest of the central part of the State; the Gulf Coast Area; the grazing area in north-central Texas; a broken, somewhat narrow belt extending in a southerly direction from the eastern part of the Panhandle to the Edwards Plateau; and a relatively small area centering on the Davis Mountains in the extreme southwestern part of the State. These areas of relatively heavy livestock concentration are designated in Figure 55 as Areas 7 (a, b, c), 18 (a, b, c), 11, 4b, and 5b, respectively. Note these principal concentrations of produce livestock (as distinguished from workstock) in relation to the amount of pasture available (Figure 31) and to the carrying capacity of these pastures (Figure 57). (For definition of animal unit and conversion factors used, see the discussion of Figure 44, page 52.)

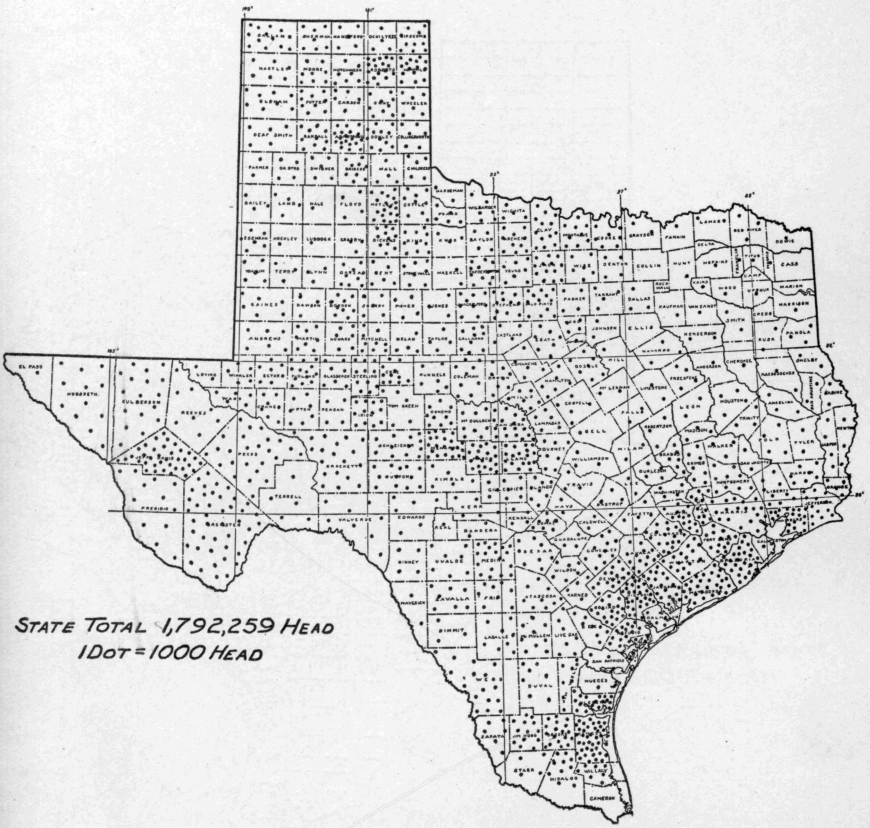


Figure 47.—**Cows and heifers two years old and over kept mainly for beef production in Texas, April 1, 1930.** (U. S. Census.) Cows and heifers kept mainly for beef constituted approximately 62 per cent of the total number of cows and heifers in Texas in 1930, and are the most important livestock enterprise in the State. (Figure 44.) The production of beef cattle in Texas is predominantly a grazing enterprise, as only a small amount of feeding normally is done. Although found generally over the State, the areas of densest concentration of beef cattle are the five areas, described in the discussion of Figure 46, in which the present system of land utilization and the conditions of water and pasture resources are relatively favorable for beef production.

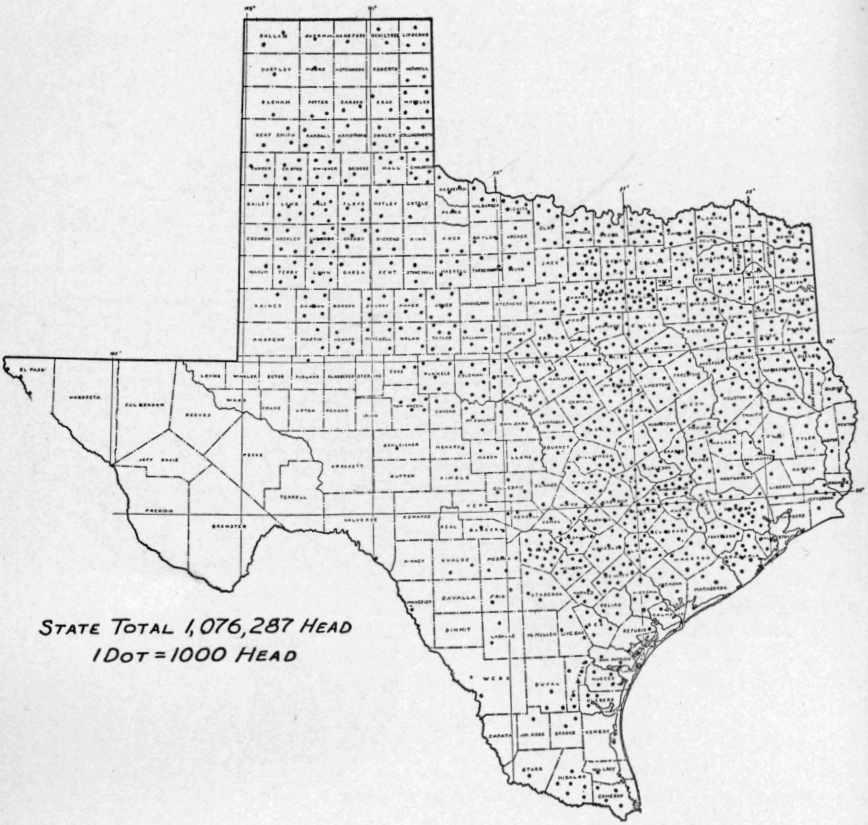


Figure 48.—**Cows and heifers two years old and over kept mainly for milk production in Texas, April 1, 1930.** (U. S. Census.) Cows and heifers kept for milk constituted only 38 per cent of the total number of cows and heifers in Texas and, in contrast with the distribution of beef cattle, are found primarily in the farming areas, with centers of relatively dense concentration near the larger cities such as Dallas, Fort Worth, San Antonio, and Houston.

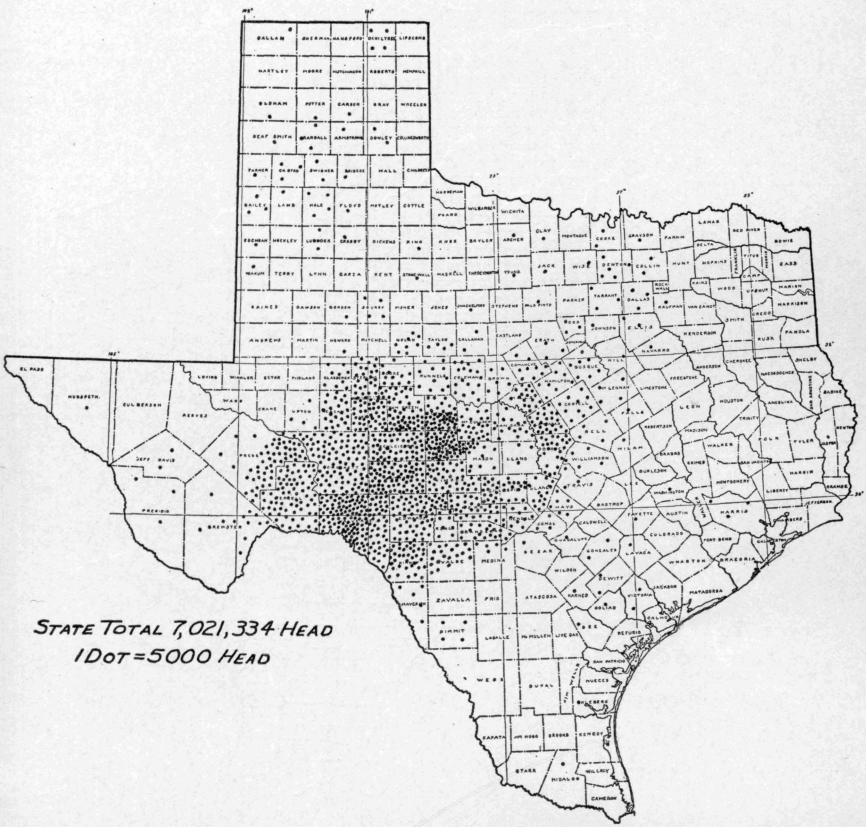


Figure 49.—**Sheep and lambs in Texas, April 1, 1930.** (U. S. Census.)

Figures 49 and 50.—**Sheep and goats in Texas.** Texas is the most important wool-producing state and usually furnishes approximately 13 per cent of the United States wool crop. Following cattle, sheep are the second most important class of produce livestock in the State. (Figure 44.) Although found in significant numbers on farms in the central and western farming areas in the State, sheep in Texas are raised primarily as a grazing enterprise conducted under extensive range conditions in a large area centered on the Edwards Plateau Grazing Area. The high altitude and dry climate associated with a rough, broken topography and an abundant growth of short grass, palatable weeds, and browse shrubs explain the concentration of sheep and goats in this area, and their association with cattle on the range for most effective utilization of the grazing resources. Relatively few sheep and goats are found in the Central Basin centered in Mason and Llano

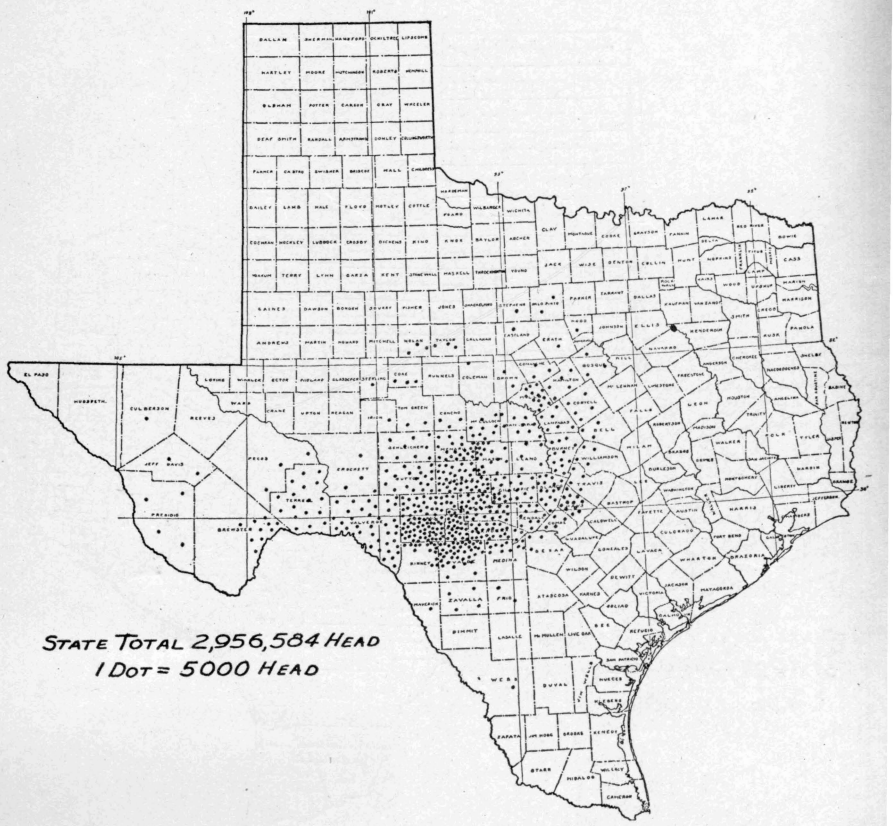


Figure 50.—Angora goats and kids in Texas, April 1, 1930. (U. S. Census.)

Counties, in which the smoother topography and relative scarcity of shrubbery provide better grazing for cattle than for sheep and goats. The densest concentration of sheep is in a belt extending in a southwesterly direction from McCulloch County to the Mexican border, in which belt the surface and vegetation are intermediate between the rough, stony, thickly shrubbed area to the southeast where the goats predominate, and the comparatively smooth, thinly shrubbed area to the northwest where beef cattle are relatively more important.

In 1920, Texas furnished approximately 81 per cent of the total mohair produced in the United States. In terms of numbers of animal units, goats are the fourth most important class of produce livestock in Texas, being preceded in order of importance by cattle, sheep, and swine. Relatively few sheep and practically no Angora goats are found in farming areas.

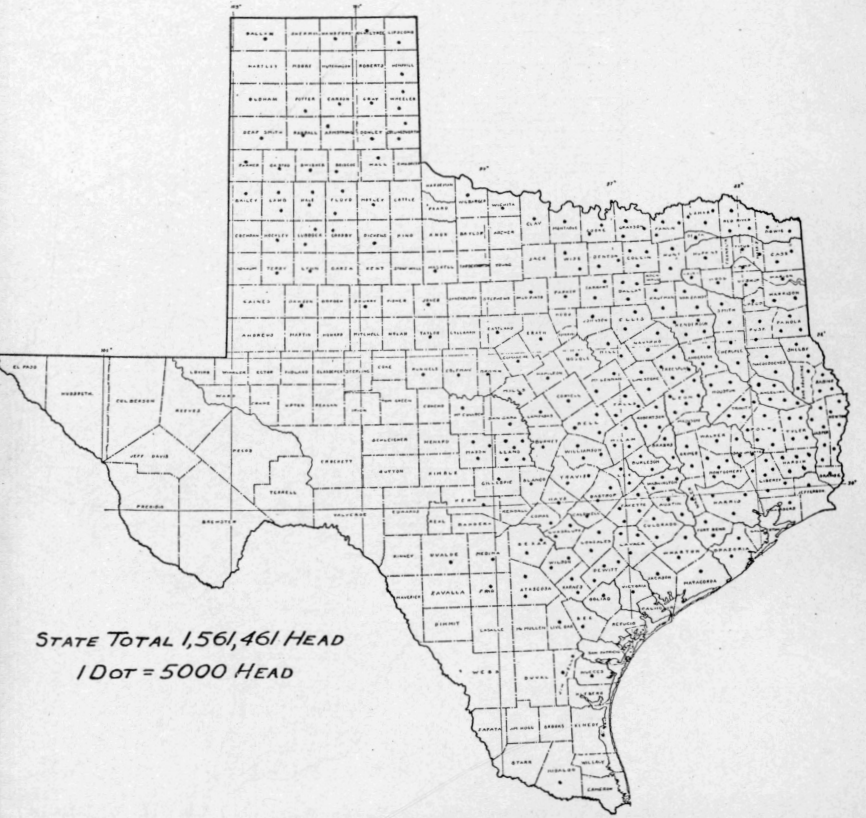


Figure 51.—**Hogs and pigs in Texas, April 1, 1930.** (U. S. Census.) Hogs are a relatively minor commercial enterprise in Texas. Although distributed widely throughout the farming areas, particularly where corn is grown, hogs are raised chiefly for home consumption and as a minor sideline to the production of cash crops. The purchase of one or two "meat hogs" from a local breeder in the spring for slaughter and home consumption in the fall and winter is a common practice in most of the farming areas. The densest concentration of hogs in Texas is in the Piney Woods Lumbering Area in the southeastern part of the State where the hog enterprise is conducted largely on the basis of mast range.

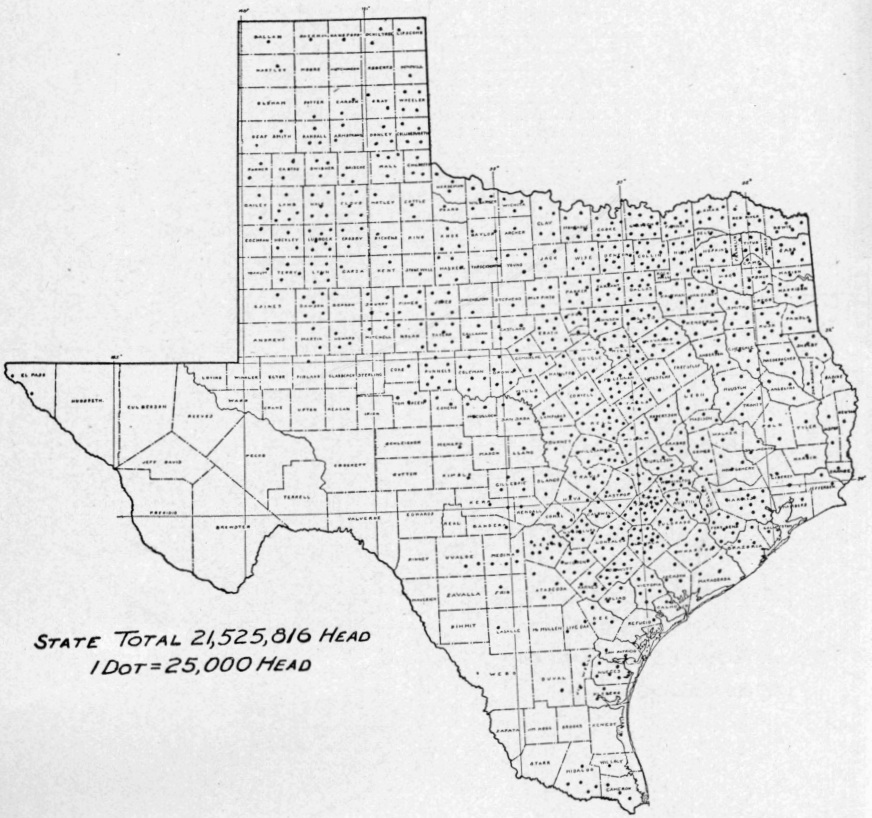


Figure 52.—**Chickens over three months old in Texas, April 1, 1930.** (U. S. Census.) Chickens are primarily a farm enterprise in Texas, as may be noted from the close relationship between their distribution and the distribution of farm population and crop land in the State. (Figures 10 and 26.) Specialized poultry production is relatively unimportant in Texas. The farm flocks averaged 53 head per farm in 1930 and, as in the case of hogs, are maintained primarily for home consumption, with some sales of surplus production. Chickens were reported on 82 per cent of all farms in the State in 1930. Poultry and hogs kept for home consumption are often fed largely with farm products that would otherwise be wasted.

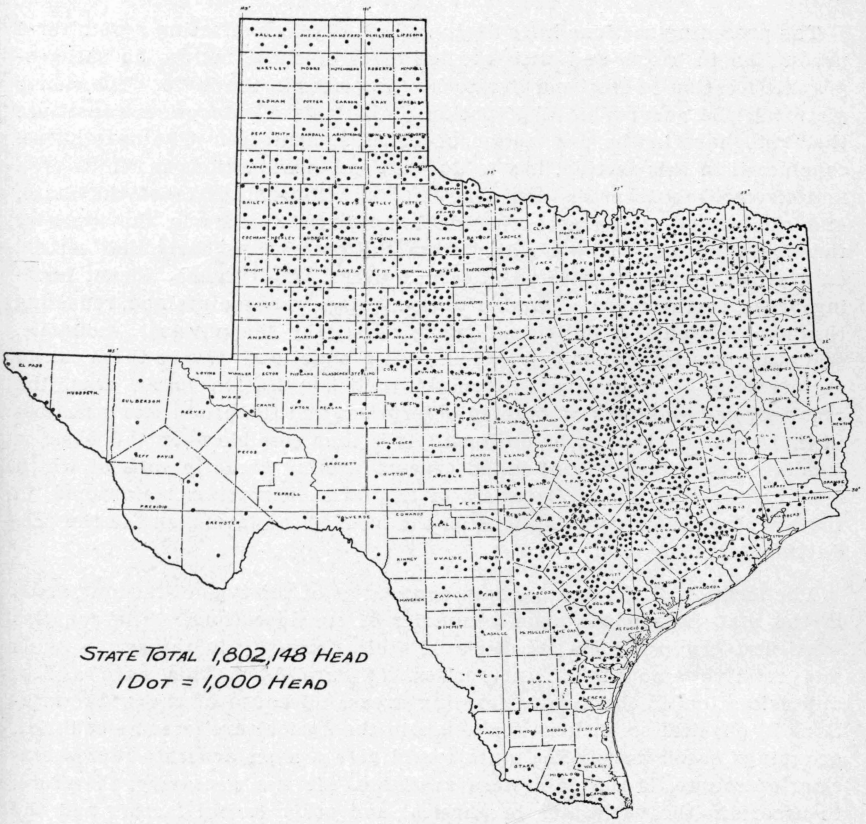


Figure 53.—**Horses and mules of all ages on farms in Texas, April 1, 1930.** (U. S. Census.) Horses and mules are next to cattle as the most important class of livestock in Texas. Of the total of 1,802,148 head of horses and mules in the State, 1,040,106 head, or 58 per cent, were mules.

Workstock constitute the chief source of farm motive power; hence their distribution over the State corresponds roughly to the distribution of crop land as shown in Figure 26. The relation is not exact, of course, because of differences in the number of crop acres operated per head of workstock, and in the extent to which farm animal power is supplemented with tractors in various parts of the State. The lowest proportion of workstock to crop acreage is in the northwestern wheat area in which a large acreage is operated per horse or per tractor unit, and in which a larger proportion of the crop land is operated with tractors than with horses.

Attention has been directed in Figure 45 to the decreasing number of horses and mules in Texas since 1926. Information obtained in several areas in the State indicates that the workstock generally is of an advanced age and that inadequate provision for farm replacements is being made. For the State as a whole, census data as of January 1, 1930, reveal that only 2 per cent of the horses and mules on farms were less than one year old. An increasingly large number of farmers are looking to tractors as replacements for their workstock, particularly in the large-scale farming sections in the western and southern parts of the State. (Figure 25.)

DELINEATION OF TYPE-OF-FARMING AREAS

The preceding sections have dealt with the factors affecting agricultural production in Texas and with the influence of these factors on the geographic location of crop and livestock enterprises in the State. The charts picturing the geographic distribution of individual enterprises constitute the first phase in the description of Texas agriculture. The next phase, considered in this section, has to do with the combinations in which crop and livestock enterprises are conducted in different parts of the State, and the extent of the areas in which uniformity exists in the types of farming followed. It was noted from the enterprise charts that certain enterprises were concentrated in certain areas. In all the significant farming areas, furthermore, a number of enterprises were maintained, reflecting the combinations on individual farms caused by the physical, economic, and other factors influencing agricultural production. Where these causal factors tend to be fairly uniform in their application in an area, the resulting combinations of adapted enterprises and the production practices in that area also tend to be uniform. It is thus possible upon this basis to subdivide the State into so-called type-of-farming areas in each of which a high degree of similarity exists in the farm enterprises maintained, in their proportionate combinations on the bulk of the farms, and in the production practices used.

The location of the approximate boundaries of the type-of-farming areas in the State was based upon a number of considerations. The counties were first grouped upon the basis of their similarity in respect to kinds and relative amounts of enterprises. (Figure 54.) This gave a first approximation of the type-of-farming areas. Because of the wide variations in physical conditions and hence in the agriculture in some counties, groupings based on smaller units would give a more accurate representation, of course, if the data were available. It was necessary, therefore, to ascertain the variations in physical and other causal factors and the resulting differences in types of farming within counties. These studies, supplemented by field observations, furnished the basis for the type-of-farming delineations shown in Figure 55. There are shown 18 type-of-farming areas in the State, of which 11 are subdivided into 30 sub-areas because of differences within these areas sufficiently significant to indicate a break in the type of farming. The designations of the major areas are shown opposite the map.

In some cases, the boundary lines between type-of-farming areas are well defined because of sharp breaks in surface or soil conditions. In most cases, however, the boundary lines are largely transition zones in which mixtures of types of farming representative of the adjacent areas may be found, or in which one type may be alternated with the other in response to price conditions, thus causing changes from time to time in the location of boundary lines of contiguous areas. Likewise, widespread changes in the agriculture of an area may be caused by factors such as changes in population, the development of new varieties of plants and of production methods that lower costs, insect pests, diseases, and others.

Considerable variation also exists, of course, in the farming systems followed within the same type-of-farming area at a given time. Since farms differ in size and also in the kinds and relative amounts of different enterprises, the determination of type-of-farming areas is based largely on the predominant or most common system of agriculture found in the area. Detailed consideration of the factors influencing the choice of the predominant system of farming in each area and of the variations from that system is deferred to the second, or analytical, phase of the study. The remainder of this part of the general study will be occupied with a discussion of the feed-livestock relations by type-of-farming areas, and with a brief description of each type-of-farming area shown in Figure 55.

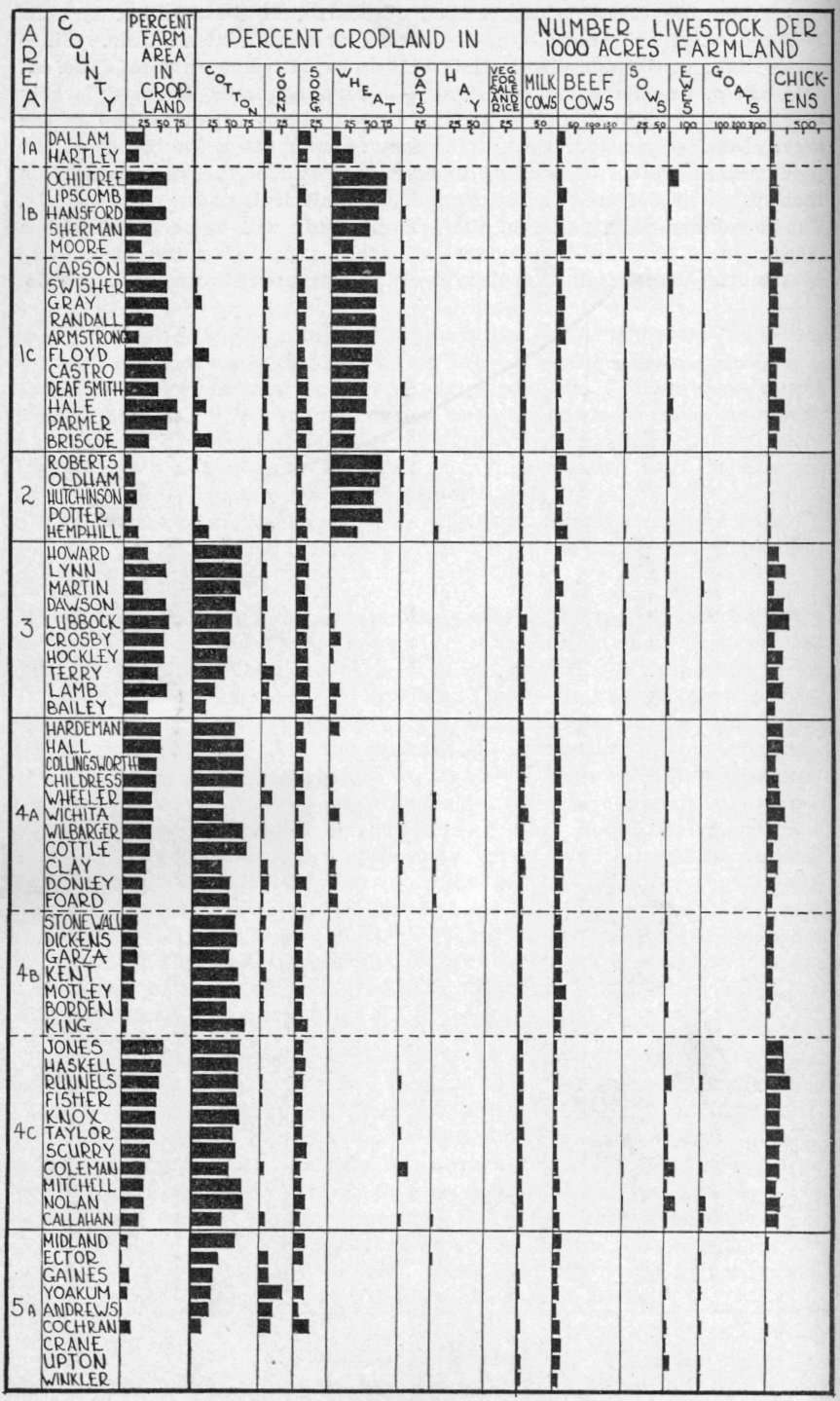
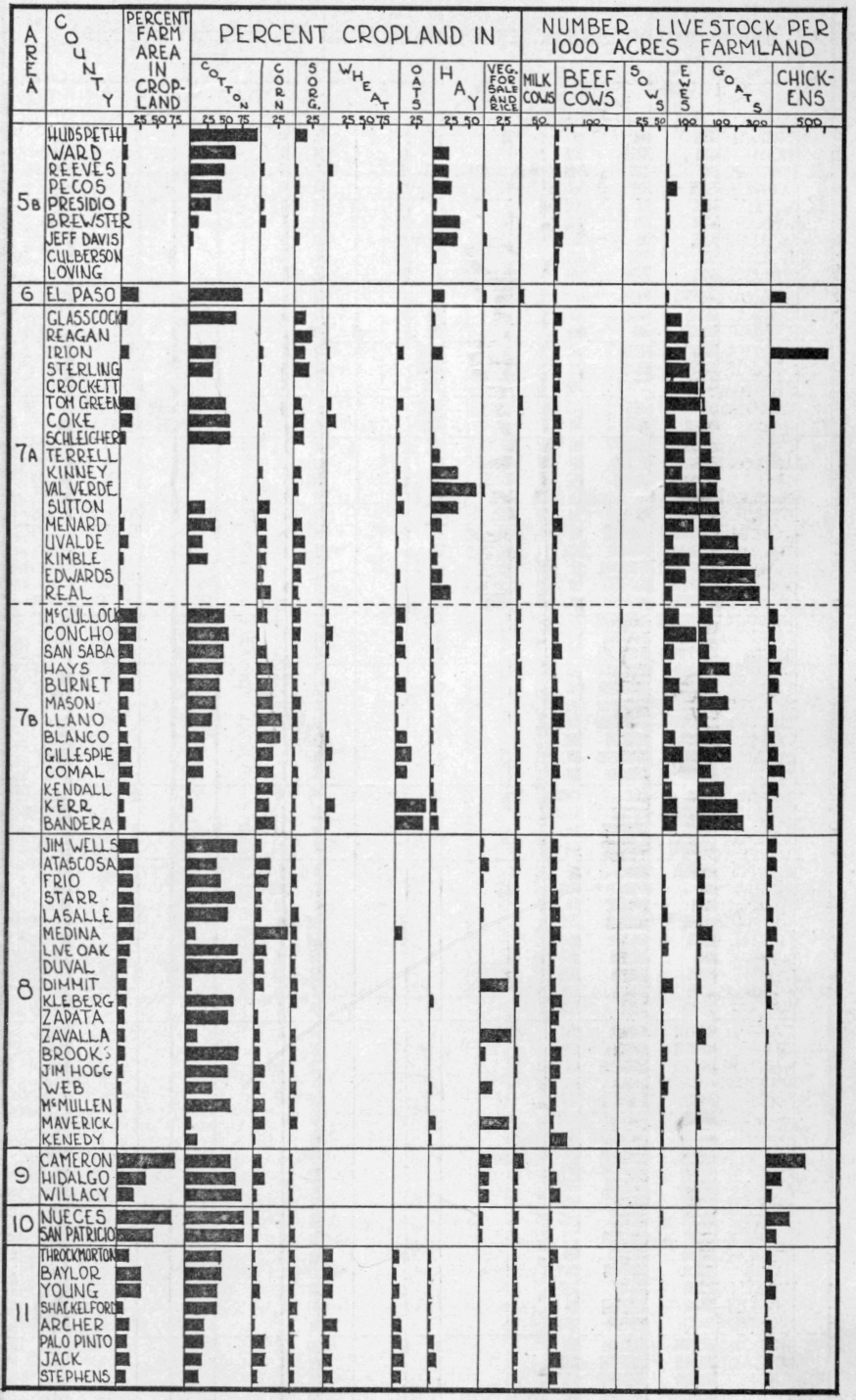


Figure 54.—See legend, page 67.



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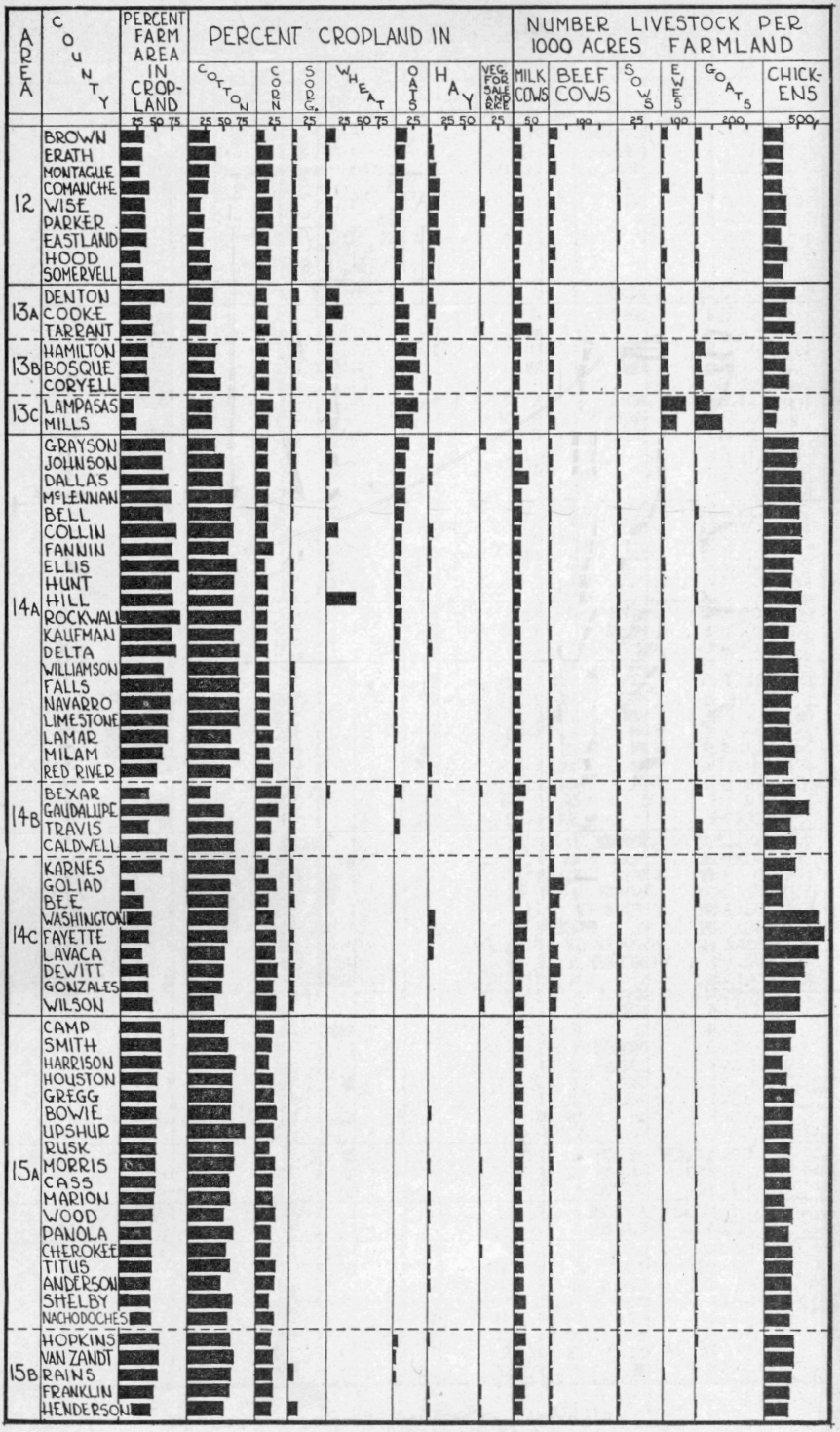

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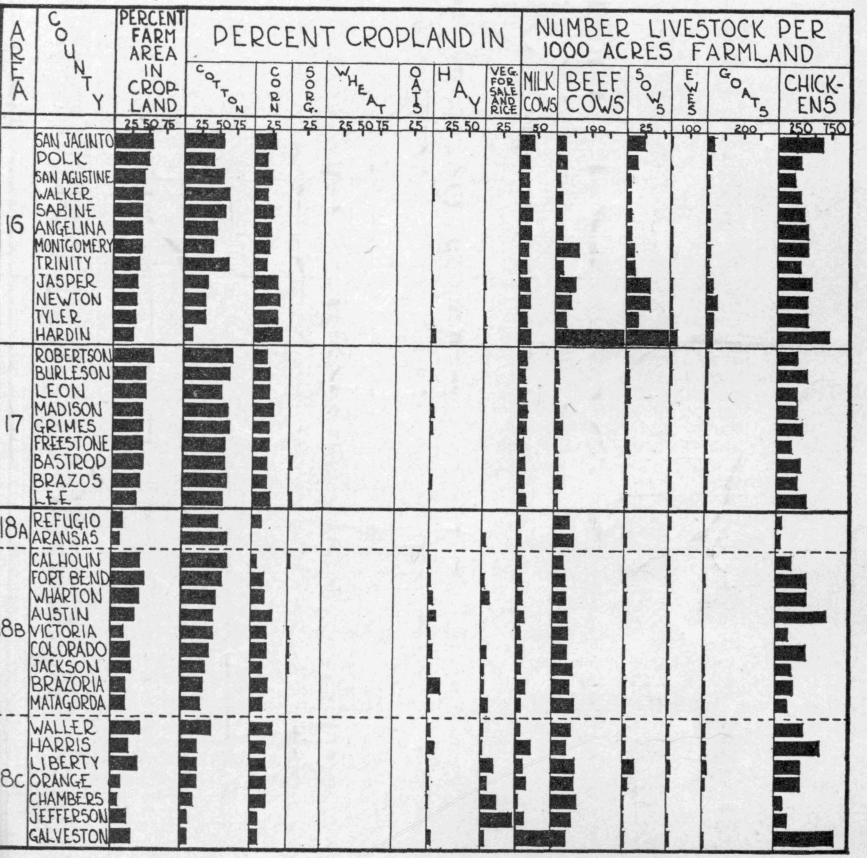

Figure 54.—**Percentage of farm land in different uses, and numbers of various classes of livestock per 1,000 acres of farm land, by counties grouped into type-of-farming areas, Texas, 1929.** (U. S. Census.) The grouping of counties on the basis of their general similarity in respect to kinds and relative amounts of enterprises gives a first approximation of the type-of-farming areas. Because of differences in their agriculture, however, parts of certain counties are not in the areas in which the counties are grouped. A more accurate subdivision of the State is shown in Figure 54, in which the boundaries between type-of-farming areas are drawn without regard to county lines. For statistical purposes, a county with two or more different types of agriculture is included in the type-of-farming area in which the greater part of its land area lies. A more accurate statistical description of type-of-farming areas would be possible if agricultural data were available by precincts.

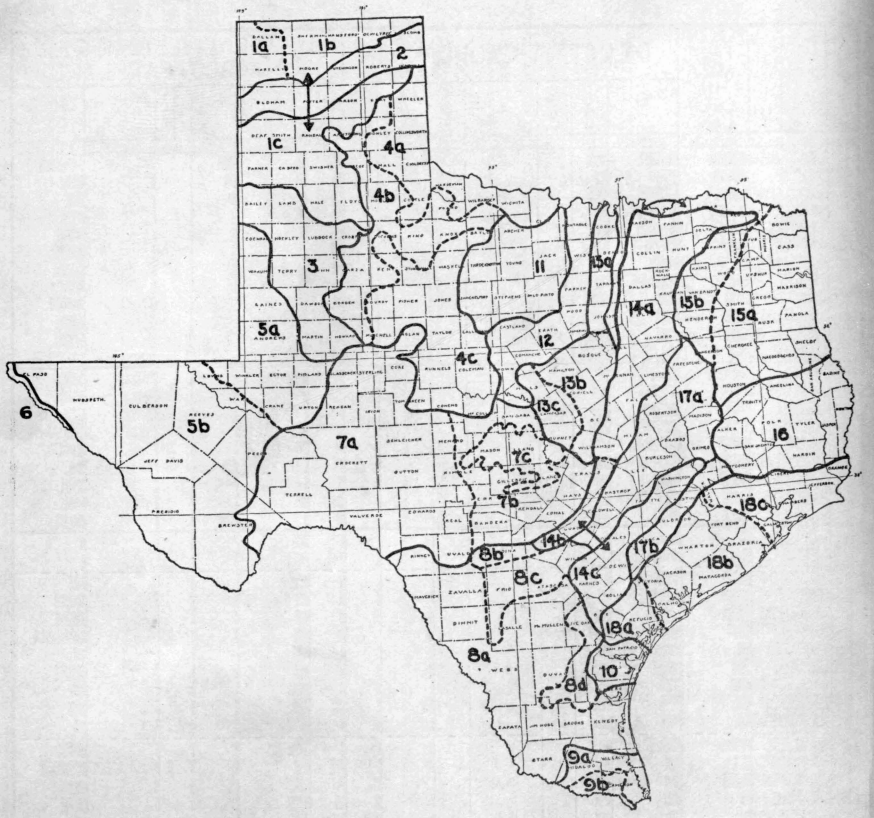

Figure 55.—**Type-of-farming areas in Texas.** In a summary description of the agriculture of Texas, the State may be subdivided into 18 type-of-farming areas in each of which the operation of natural and economic factors has resulted in a high degree of similarity in the farm enterprises maintained, in their proportionate combination on the bulk of the farms, and in the production practices used. Eleven of the major type-of-farming areas are further subdivided into 30 sub-areas because of differences within these areas sufficiently significant to indicate a break in the general type of farming. The designations of the areas and sub-areas are shown on the opposite page, and a brief description of the agriculture in each is given in the text, beginning on page 74.

Because of the wide differences in natural and economic situations, and hence in the types of agricultural production and problems in different parts of Texas, it is a well-recognized fact that recommendations as to farm and production adjustments are not uniformly applicable on a State-wide basis. The delineation of the State into type-of-farming areas indicates the limits within which specific research results may have application.

TYPE-OF-FARMING AREAS IN TEXAS

AREA:

1. **Panhandle Wheat Area.**
1a. Sandy soils; grain sorghums, corn, beef cattle.
1b. Large-scale specialized wheat production; dark, heavy soils; smooth land.
1c. Similar to (b) except more grain sorghums, cotton, and livestock; less specialized.
2. **Canadian River Grazing Area**—beef cattle; rough, broken lands of the Canadian River basin.
3. **High Plains Cotton Area**—cotton and grain sorghums; cattle grazing in the less developed parts of the area; smooth, level plains; light, sandy soils; large-scale methods.
4. **Low Rolling Plains**—mixed types; cotton and grain sorghums; cattle ranching; rolling topography; wide variations in soil types; numerous grazing and farming areas alternating.
4a. Farming predominates; extensive grazing areas.
4b. Grazing predominates.
4c. Farming predominates.
5. **High Plains and Trans-Pecos Cattle Grazing Area.**
5a. High Plains. Dry, level plains; sandy soils; little farming; large ranches.
5b. Trans-Pecos. Dry and mountainous; small amount of irrigated farming; large ranches.
6. **Upper Rio Grande Valley Irrigated Area**—cotton and alfalfa.
7. **Edwards Plateau Grazing Area**—cattle, sheep, and goats; shallow, stony soils; rough, broken topography; live-oak and shin-oak brush.
7a. Large ranches; practically no farming.
7b. Small ranches; some farming.
7c. Central Basin. Mostly cattle grazing; some farming.
8. **Rio Grande Plains Area**—mixed types; cattle grazing; some cotton; vegetable growing, largely under irrigation.
8a. Cattle grazing; vegetables.
8b. Corn, small grain, cotton; some grazing.
8c. Cotton, corn, vegetables; some grazing.
8d. Cotton, vegetables, and grazing.
9. **Lower Rio Grande Valley Area**—Winter vegetables, citrus, and cotton; some grazing.
9a. Dry farming; cotton, vegetables, and grazing.
9b. Irrigation farming; citrus, vegetables, and cotton.
10. **Corpus Christi Cotton Area**—cotton and vegetables; dark, rich soils; level topography; large-scale methods.
11. **North-Central Grazing Area**—cattle grazing; small amount of farming, similar in nature to that in surrounding areas.
12. **Western Cross Timbers Farming Area**—cotton, grain sorghums, corn, peanuts, and watermelons; sandy soils.
13. **Grand Prairie Area**—cotton, small grains, and corn; ranching; dark soils varying greatly in depth; rolling topography.
13a. Cotton, wheat, oats, corn; some ranching.
13b. Cotton, oats, wheat, corn; ranching.
13c. Ranching—cattle, sheep, and goats; cotton, small grains.
14. **Black Prairie Area**—cotton, corn, and small grains; deep, black, fertile soils; level to rolling topography.
14a. Cotton, corn, and small grains.
14b. Cotton and corn.
14c. Cotton, corn, and livestock.
15. **Northeast Sandy Lands Area**—cotton, corn, vegetables, and fruits; sandy soils; rolling topography; small farms, small irregular-shaped fields, small tools.
15a. Pine-covered.
15b. Oak-covered.
16. **Piney Woods Lumbering Area**—lumber, cotton, corn, range cattle, and hogs; self-sufficing farming.
17. **Post-Oak Area**—cotton, corn, truck crops, and beef cattle; sandy soils; farming mostly on interior prairies and bottom lands.
18. **Coast Prairie Area**—mixed types—cotton and corn; rice; fruits and vegetables; cattle grazing; widely varying soils; level topography and poor drainage.
18a. Cattle ranching.
18b. Cotton, cattle ranching, and rice.
18c. Rice, cattle ranching, and cotton.

Feed-Livestock Relations By Type-of-Farming Areas

There is shown in Figure 56 a graphic description, for each type-of-farming area, of the proportion of total farm land in various leading crops, including pastures. This composite picture serves to indicate the relative importance in different areas of the principal crops for which distribution charts are shown in the preceding section, and the variations in land utilization that exist from one area to the other. The predominant type of agriculture in each area may be readily noted from the manner in which the land is utilized. Thus, Areas 2, 5, 7, 8, and 11 are used primarily for the extensive grazing of livestock, as indicated by the range of 82 to 98 per cent of the total farm land in pasture. In Areas 1, 3, 6, 9, 10, 13, 14, 15, 16, and 17, on the other hand, from 40 to 65 per cent of the farm land is used for crop production. Intermediate between these two groups are Areas 4, 12, and 18, in which approximately two-thirds of the farm land is used for grazing, but in which extensive field-crop areas are also found.

Figures 31 and 32 served to describe the distribution of pasture land and the types of native vegetation in different parts of the State. Supplementing the information in these two charts, Figure 57 shows the carrying capacity of pastures by type-of-farming areas. The pasture feed available and the kinds of feed produced in connection with the cropping systems pictured in Figure 56 have a direct influence on the kinds of livestock kept in the various type-of-farming areas, as may be noted from Figure 58. In the areas used predominantly for grazing, indicated in Figure 56 and discussed in the preceding paragraph, the utilization of land for pasture yields roughages that may be converted into salable products only through grazing livestock such as cattle, sheep, and goats. In the areas in which large amounts of land are used for the production of field crops, relatively more concentrates are produced than in the predominantly ranching areas, and the numbers of workstock, hogs, and poultry are relatively high compared with the number of cattle kept.

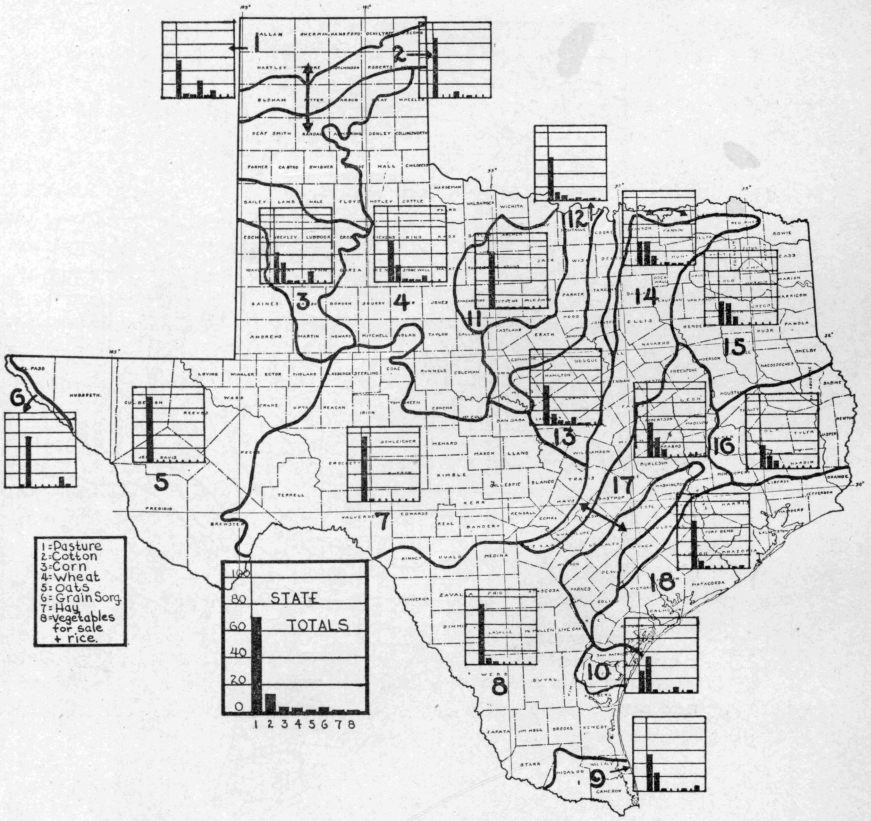

Figure 56.—**Percentage of farm land in various crops, by type-of-farming areas, Texas, 1929.** (U. S. Census.) This figure furnishes a general description of the land utilization in each of the major type-of-farming areas in Texas, and serves to summarize the information given on a county basis in Figure 54. On the basis of the classification of the land in livestock ranches as farm land, as reported by the Census, approximately 70 per cent of the 124,707,130 acres in farm land in Texas in 1929 was used for pasture. Cotton ranked second in terms of area occupied, with 13 per cent of the farm land devoted to its production. The combined acreage in corn, wheat, oats, grain sorghums, hay, vegetables for sale, and rice comprised 11 per cent of the farm land. Note, however, the wide variation in land use as between the different type-of-farming areas. In Area 6, irrigated and intensively farmed, approximately 95 per cent of the farm land was in field crops in 1929. In Area 5, immediately to the east, approximately 98 per cent of the farm land was utilized for extensive livestock grazing. Various gradations as between these two extremes of land use exist in the other areas, and in the kinds and relative acreages of crops grown.

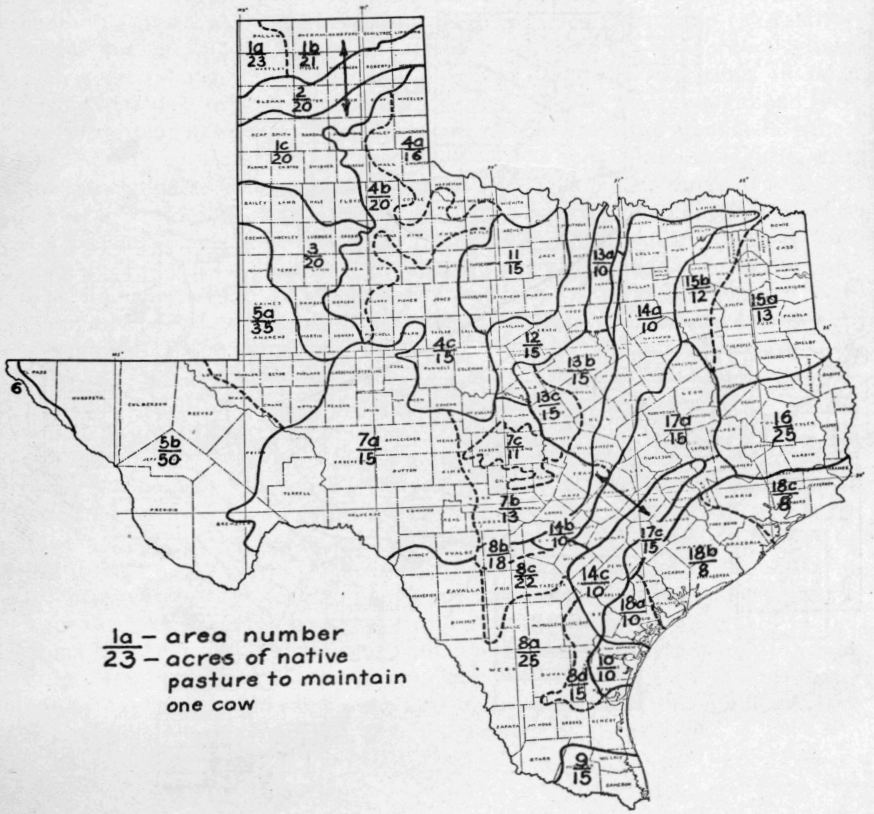

Figure 57.—Carrying capacity of native pastures, by type-of-farming areas, Texas. Carrying capacity as used in this chart refers to the average number of acres of native pasture required to support a mature cow or its equivalent for one year, without supplemental feeding. The wide variations in carrying capacities of native pastures in the various type-of-farming areas are results of differences in the types and feed yields of native pasture vegetation, which in turn are influenced by differences in soils, surface, and climate. The types of native vegetation in different parts of the State are shown in Figure 32.

The data upon which this chart is based were prepared by the livestock committee functioning in connection with the regional agricultural adjustment study conducted at the Texas A. and M. College in 1935.

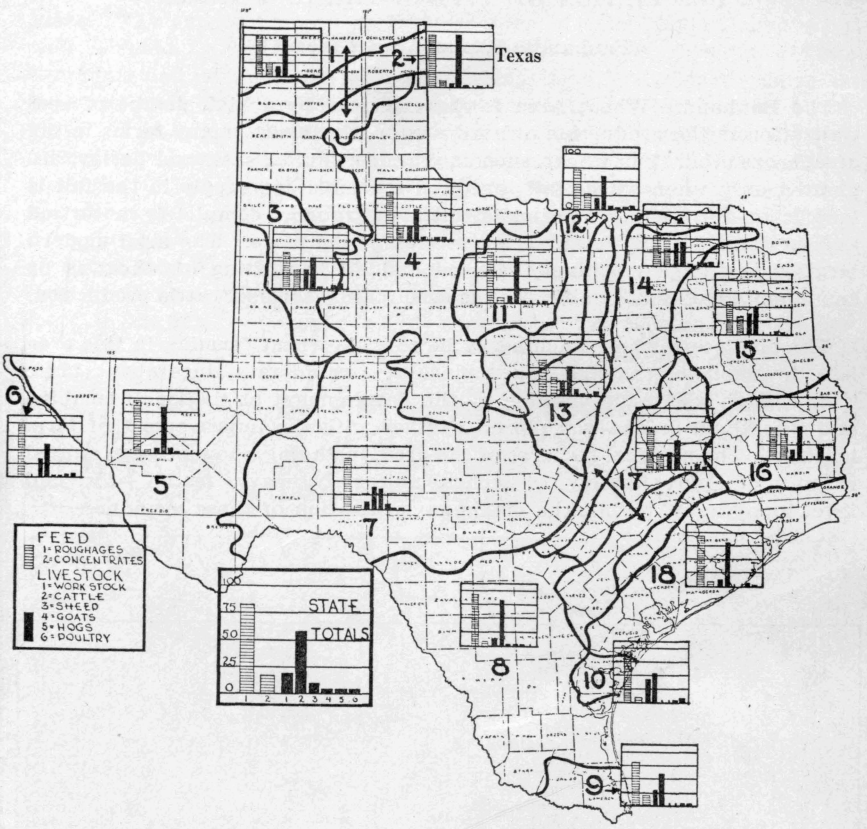

Figure 58.—**Proportions of total feed production in roughages and in concentrates, and proportions of total livestock in various classes, by type-of-farming areas, Texas, 1929.** In general, the utilization of farm land and the type of feed produced affect directly the kinds of livestock kept. For example, in Area 5, in which the utilization of approximately 98 per cent of the farm land in pasture yields feeds that are largely roughages not susceptible of being harvested, the grazing of cattle is predominantly the leading enterprise. In Area 7, in which approximately 93 per cent of the farm land is in pasture, livestock production is also the predominant enterprise, but sheep and goats are relatively more important than cattle because of the type of vegetative covering. (Figure 32.) In Area 14, in which the farm land is utilized primarily for the production of field crops, principally cotton, workstock are the principal class of livestock. In the areas in which the production of field crops is important, relatively more concentrates are produced and more hogs and poultry are kept than in the predominantly grazing areas.

The data upon which this chart is based were prepared by the livestock committee of the regional adjustment study conducted at the Texas A. & M. College in 1935. The total amount of feed in each type-of-farming area was computed on the basis of the utilization of land in 1929, described in other parts of this publication, and of long-time average yields of crops and carrying capacities of different types of pasture. The total amounts of various feeds in each type-of-farming area were then converted into total digestible nutrients as a basis for estimating the proportions in roughages and concentrates. Livestock numbers were converted into animal unit equivalents, as described in the discussion of Figure 44, in order to determine the relative proportions of the various classes of livestock in each area.

DESCRIPTION OF TYPE-OF-FARMING AREAS

Panhandle Wheat Area (Area 1)

The Panhandle Wheat Area is characterized by a high degree of specialization in the production of hard winter wheat. On many farms in the area, crops other than wheat, such as grain sorghums, oats, and barley, are planted only when wheat fails or when the moisture supply in the fall is insufficient for seeding. Farms in this area are more completely motorized and mechanized than in any other section of the State. The most modern large-scale tillage machinery is used and all harvesting of wheat is by combine. Land not in cultivation is used mainly for beef cattle production.

The displacement of ranching by large-scale wheat farming in this area is a development that has taken place at a rapid rate since about 1920. This change was made possible by the development of the small combine and wheatland or one-way plows together with the improvement of farm tractors. The physical features of the area, including a low average annual rainfall of approximately 20 inches, uniformly heavy, fertile soils, and level topography, permit the maximum utilization of these machines.

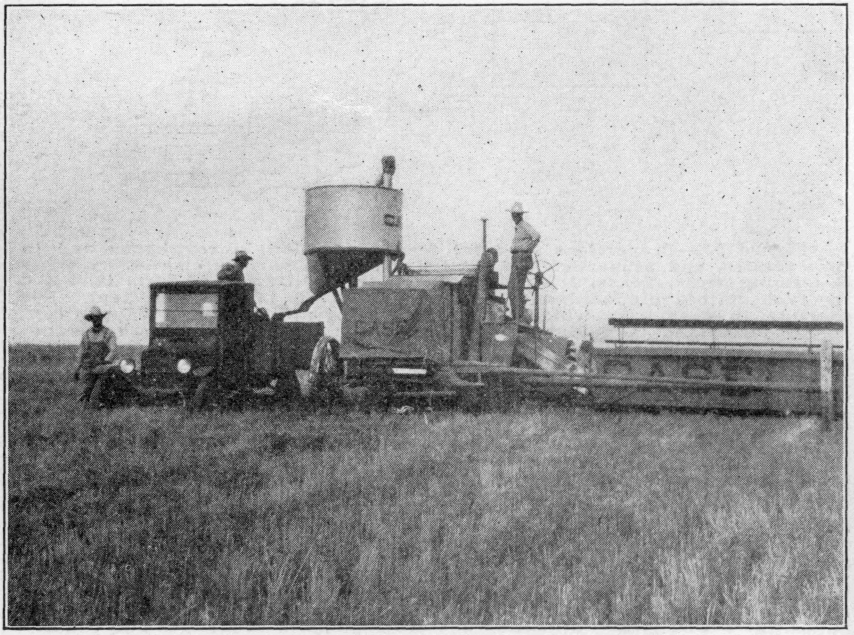

Figure 59.—All wheat harvesting is done by combine in the Panhandle Wheat Area. Low-cost production and harvesting methods have made possible the rapid expansion of wheat acreage in this area.

This area is divided into two parts by the Canadian River breaks. The portion of the area lying to the north of the river is divided into two sub-areas. The one designated as 1a is an area of sandy soils that are not well adapted to wheat production. The chief crops grown are grain sorghums and corn. Much of this sub-area is still devoted to ranching. Sub-area 1b is the most highly specialized wheat-producing section of the State. It is in this portion of the area that large-scale methods are used to maximum advantage. Sub-area 1c, lying south of the Canadian River, is similar to Sub-area 1b in that the dominant soil types are clay loams, and wheat production on a large scale is the principal enterprise. It differs from Sub-area 1b to the extent that lower altitudes, longer growing seasons, and somewhat lighter soils permit a wider selection of crops. There is an overlapping of cotton and wheat production in the southern part and more or less general farming is done throughout this portion of the area.

Canadian River Grazing Area (Area 2)

The rough broken lands along the Canadian River can be used only for grazing, and beef production is the only important enterprise in the area.

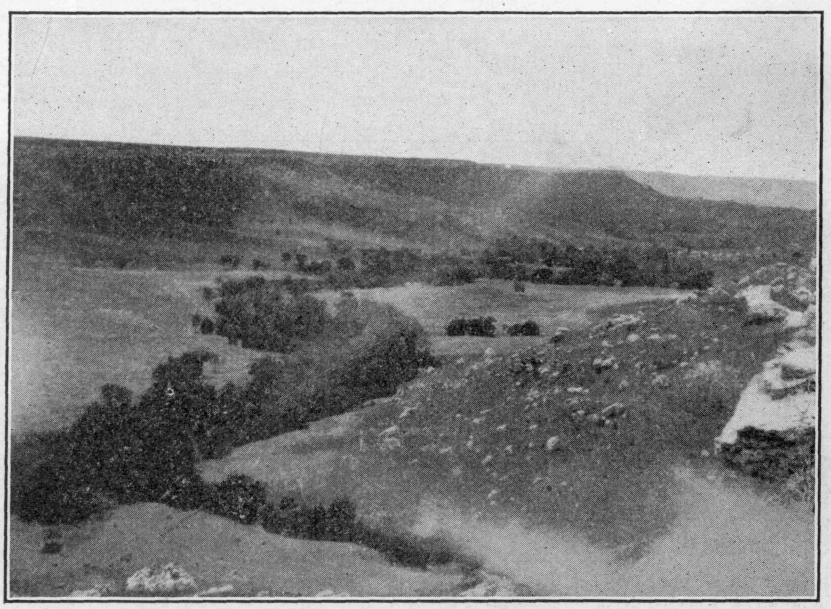

Figure 60.—Cattle ranching is the only important enterprise in the rolling and broken Canadian River Grazing Area.

Ranches are of two main types or a combination of the two: those that maintain a breeding herd and produce calves, and those that depend on steer herds to utilize the range. The cropping systems on the limited areas of cultivated land are similar to those in Area 1.

High Plains Cotton Area (Area 3)

This area includes the southern portion of the High Plains in which fine sandy loam soils predominate and in which the rainfall averages about 20 inches annually. Cotton is grown on about one-half of the crop land, while the grain sorghums, a small amount of corn, and sudan grass for pasture and seed account for the remainder. Livestock production is of secondary importance, except in the less developed portions of the area in which cattle ranching still prevails. On most farms there are from one to five milk cows and 50 to 100 chickens, while a brood sow or two may be kept on an occasional farm.

As in Area 1, the crop alternatives in this area are limited to drought-resistant crops. However, the sandy soils and longer growing season favor cotton production over wheat production. The physical features of the area are also conducive to large-scale methods of production. The light rainfall makes weed control a minor problem, while the smooth surface of the land permits the use of multi-row planting and cultivating machinery. The great majority of farmers use two-row equipment, although in recent years the number of three- and four-row machines has greatly increased. The majority of farm families operate from 160 to 320 acres of land, of which from 80 to 85 per cent will be in cultivation, and produce an average of not less than 25 to 30 bales of cotton per year. In addition, a surplus of either feed or livestock products or both may also be produced. A large proportion of the cotton harvesting is done with hired labor.

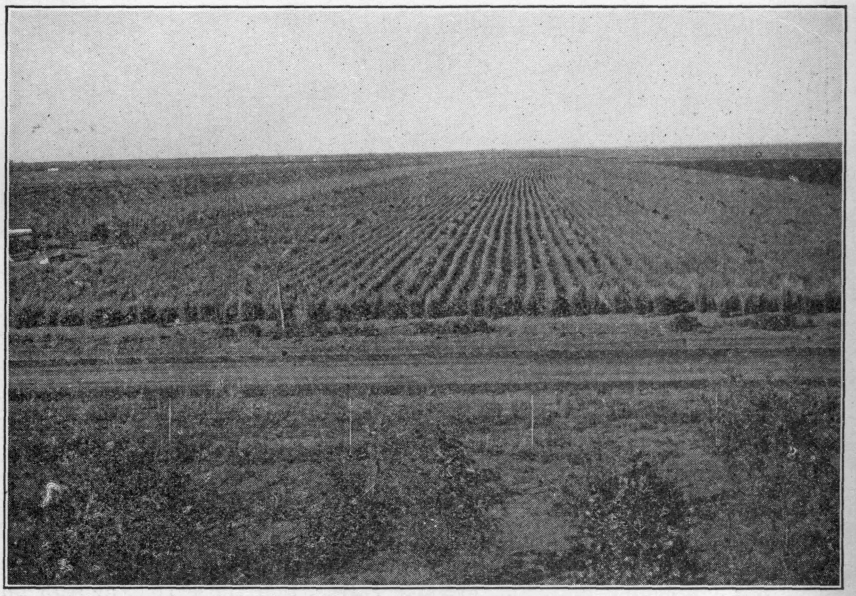

Figure 61.—Level topography, fertile soil, and climatic conditions favorable to weed control make possible the use of large-scale methods in the production of cotton and feed crops in the High Plains Cotton Area.

Low Rolling Plains Area (Area 4)

Wide variations in soils and topography have resulted in mixed types of farming in this area. On the more level areas of sandy loam soils, cotton and grain sorghums are practically the only crops grown, and the organization of farms is similar to that in Area 3, while on the heavier soils or so-called "tight land", an important amount of small grain, primarily wheat and oats, is produced. Although large blocks of good, smooth, fertile land are still used for cattle grazing, ranching operations tend to be concentrated in the areas of rolling, broken land. While the entire area is characterized by alternating areas of farming and ranching, the portions of the area in which farming predominates are indicated in Figure

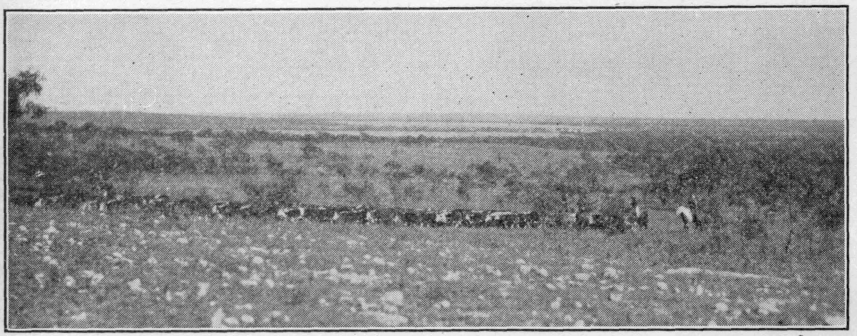

Figure 62.—Rolling, broken areas used only for cattle grazing alternate with farming areas in the Rolling Plains. (Photograph supplied by SMS Ranch, Stamford, Texas.)

Figure 63.—The smooth, fertile lands of the Rolling Plains produce large yields of cotton and feed crops when climatic conditions are favorable.

55 as 4a and 4c. Sub-area 4b represents the more rolling and broken lands on which grazing predominates. As compared with Area 3, the annual rainfall averages slightly more, the growing season is longer, and the average size of farms is somewhat smaller. A greater proportion of the cultivated land of this area is planted to cotton than is the case in Area 3; consequently less feed is grown for sale and fewer livestock and livestock products are produced.

High Plains and Trans-Pecos Cattle Grazing Area (Area 5)

Sub-area 5a comprises the more arid and southernmost portions of the High Plains. Cattle ranching on an extensive scale is the only important enterprise. A little farming similar to that in Area 3 is found along the northeastern boundary. The soils vary from light sands to heavy clay loams. The land surface is smooth to gently rolling. The average annual rainfall is approximately 15 inches. The rainfall becomes rapidly less and the hazards of farming correspondingly greater from the northeastern to the southwestern portion of the sub-area.

The greater portion of the State lying west of the Pecos River is included in Sub-area 5b. Beef cattle production is the only important enterprise. This sub-area has the lowest average annual rainfall of any large section of the State. The topography varies from comparatively level plains and

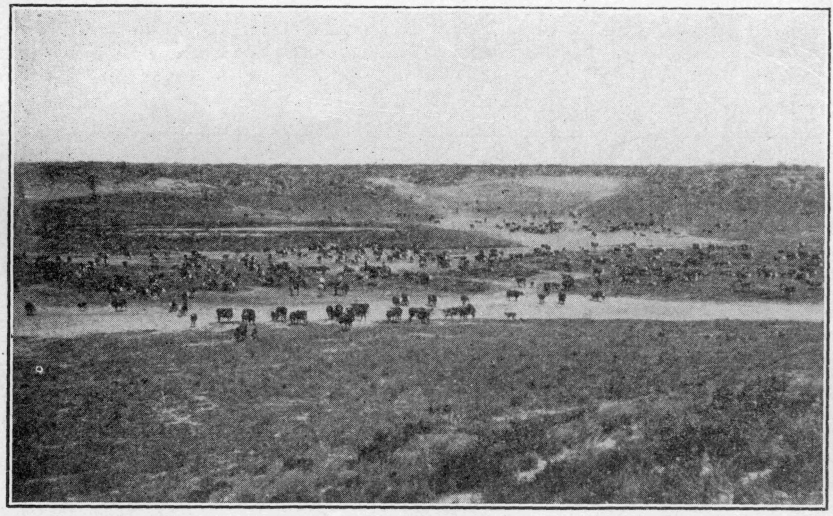

Figure 64.—Cattle around a watering place in the High Plains Grazing Area.

basins to mountains with some peaks rising over 8,000 feet. Most of the area averages well over 4,000 feet in altitude. The soils are mostly shallow and stony or gravelly, except in some of the basins. This combination of light rainfall, rugged topography, and thin soils has resulted

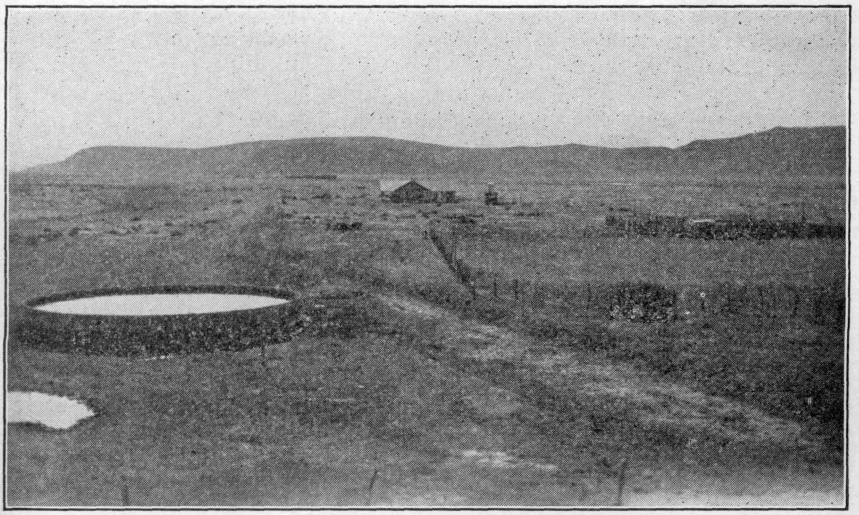

Figure 65.—A ranch headquarters in the Davis Mountain section of the Trans-Pecos Cattle Grazing Area.

in a light covering of vegetation, a low carrying capacity of ranges, and consequently a most extensive type of ranching. The average size of ranch is approximately 20,000 acres, or over 30 sections. Some of the larger ranches contain 100 or more sections. Such farming as is done is confined to small areas of fertile lands that can be irrigated from the limited supplies of water from springs and streams. Cotton and alfalfa are the main crops produced in such areas.

Upper Rio Grande Valley Irrigated Area (Area 6)

This area comprises a narrow strip of alluvial soils extending about 70 miles along the Rio Grande River above and below El Paso. All crops are irrigated. Cotton normally occupies more than 75 per cent of the crop land while alfalfa, the crop next in importance, occupies 15 per cent. Some fruit and truck crops are grown, and feed crops such as corn and grain sorghums are produced in limited quantities. Dairy products and poultry products are produced in excess of farm needs to meet the demand for such products in the nearby towns and cities.

The great distance from large consuming centers or central markets has had an important influence on the character of farming in this area. Because of high transportation costs, only products having high values per unit of weight are produced in excess of local needs. For example, the acreage of alfalfa has varied but little during the whole period of rapid expansion of agriculture that has taken place since 1918. On the other hand, the increase in the cotton acreage has paralleled the increase in the cultivated area. Because of its bulk or low value per unit of weight, hay production is limited to the amount that can be sold within a compara-

tively short radius of the place of production, whereas cotton can be sent to the central markets at a cost representing a comparatively small percentage of its value.

Edwards Plateau Grazing Area (Area 7)

The Edwards Plateau and Central Basin comprised in this area include approximately 25,000,000 acres of land, much of which has a rough, broken topography and shallow, stony, clay-loam soils. A wide range of vegetation comprising grasses and various types of brush permits a diversified system of grazing involving cattle, sheep, and Angora goats. A high percentage of the sheep and goats in the State are concentrated in this area.

Differences in the proportions of cattle, sheep, and goats grazed in different parts of the area are determined to a large extent by variations in the type of range. Thus, on the rougher, more broken, and brush-covered range, the number of goats tends to be large as compared with the numbers of sheep and cattle. On the smooth, open grass lands, cattle occupy a large place in the system, while the number of goats is small as compared with the number of cattle, and sheep may or may not constitute an important enterprise. On the intermediate types of range, all three types of livestock are found in important numbers, with sheep predominating.

Rio Grande Plains Area (Area 8)

Cattle ranching is the principal enterprise in the Rio Grande Plains. Climatic conditions throughout most of the area are such that crop production is hazardous except under irrigation.

The area is subdivided into four parts. Sub-area 8a is devoted in large measure to grazing. Practically the only exceptions are small scattered blocks of irrigated lands in which spinach, onions, and other truck crops are grown. Most of the irrigated lands are alluvial soils along the Nueces and Rio Grande Rivers, and smooth uplands of the Duval-Webb series. Sub-areas 8b, c, and d are distinguished from 8a primarily on the basis of the amount of farming done as compared with ranching, and from each other on the basis of the kinds and proportions of crops grown. Sub-area 8b is a small area of gravelly clay-loam soils that are gently rolling to hilly in topography. On the smoother lands, corn, grain sorghums, small grains, and a little cotton are produced. In Sub-area 8c the prevailing soil types are fine sandy loams. The topography is rolling. Corn, grain sorghums, cotton, watermelons, and truck crops are the main crops grown. Although dry-land farming predominates in this portion of the area, there are many irrigated farms.

In Sub-area 8d, the soil types vary from sandy loams to heavy clays. The topography is sharply rolling. Cultivation is limited to the small areas of smooth lands scattered throughout the sub-area, many of which consist of alluvial soils adjacent to streams. Cotton, corn, and grain sorghums are the main crops on the heavier soils in the central and

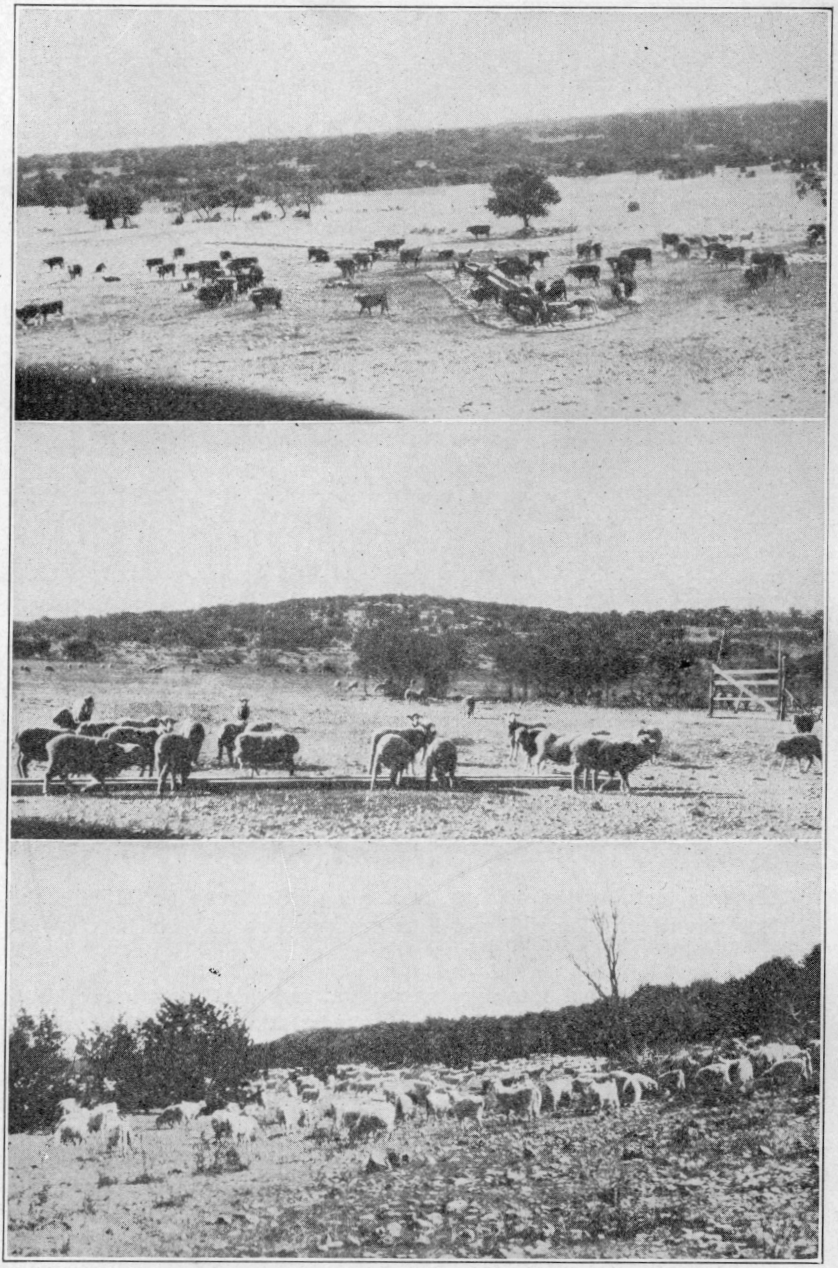

Figure 66.—Cattle, sheep, and goats are grazed in combinations for the best utilization of the range in the Edwards Plateau Grazing Area. Cattle predominate on the smooth, open grasslands; sheep are more numerous on the moderately rough, rolling lands; and goats are found in greatest numbers on rough, broken, and brushy lands.

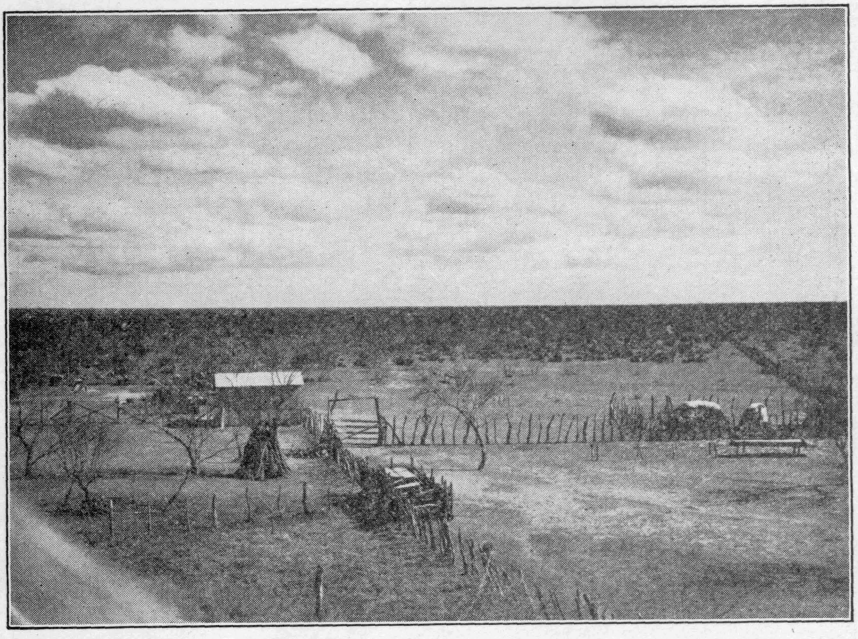

Figure 67.—A view from a ranch headquarters in the northwestern part of the Rio Grande Plains.

northern part of the sub-area. On the sandy soils in the southern part, cotton is relatively less important while truck crops and dairying are important enterprises.

Lower Rio Grande Valley Area (Area 9)

This area includes the smooth, fertile lands in Cameron, Hidalgo, and Willacy Counties. The soils are highly productive and the long growing season permits the production of a wide range of crops.

The area is divided into two parts: 9a, in which practically all the farming is conducted under dry land methods; and 9b, in which irrigation farming predominates. The soils in 9a are largely sandy loams which, together with a level to gently rolling topography, make this portion of the area well adapted to extensive methods of cotton and vegetable production. Ranch lands are rapidly being cleared of brush and put into cultivation. Cotton, corn, and grain sorghums are the principal crops grown, although large acreages of onions, watermelons, and other vegetables are also produced. Citrus production is of little consequence in this part of the area.

The production of citrus fruits and winter vegetables characterizes the agriculture of Sub-area 9b. The long growing season and the control of moisture through irrigation permit intensive use of land. Land not in

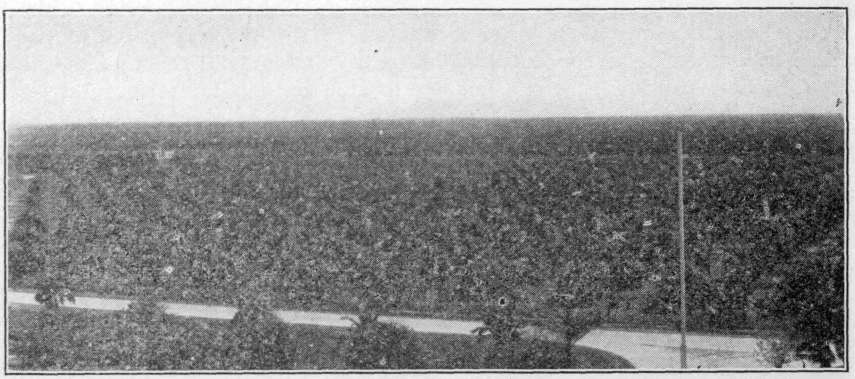

Figure 68.—Citrus production characterizes the agriculture of the Lower Rio Grande Valley.

bearing citrus trees is frequently double-cropped through the planting of cotton and feed crops after the harvesting of winter vegetables.

The soils in this portion of the area are mainly loams and clay loams and the level topography is broken only by an occasional arroyo. These arroyos provide natural drainage for the area.

Corpus Christi Cotton Area (Area 10)

In this area, which includes most of Nueces and San Patricio Counties, and parts of Jim Wells and Kleberg Counties, multi-row planters and tillage implements, particularly four-row, are used more extensively than in any other section of the State. The extensive use of two-, three-, and four-row equipment has been possible because of large areas of very fertile, level land, and because of climatic conditions favorable to weed control.

The shift from cattle ranching to large-scale cotton production in this area occurred largely since 1910, and closely paralleled the improvements in machinery used in producing cotton. Cotton usually occupies more than 80 per cent of the crop land. The remainder is taken up by corn, grain sorghums, and vegetables. In addition to being the most highly specialized cotton-producing section in the State, the area is an important and rapidly-expanding vegetable-growing center. Cabbage, onions, spinach, and various other vegetables are produced, mainly under dry-land conditions. Frequently, a crop of vegetables and a crop of cotton are harvested from the same land during the same year.

North-Central Grazing Area (Area 11)

Cattle ranching is the main enterprise in this area. It is one of the important beef-producing centers of the State. A large proportion of the land in the area is either too rolling and broken or the soils are not well

adapted for crop production under the climatic conditions prevailing in the area. Such farming as is done is similar to the farming in adjoining areas and tends to be concentrated in small communities throughout the area. These communities are usually located on small interior prairies

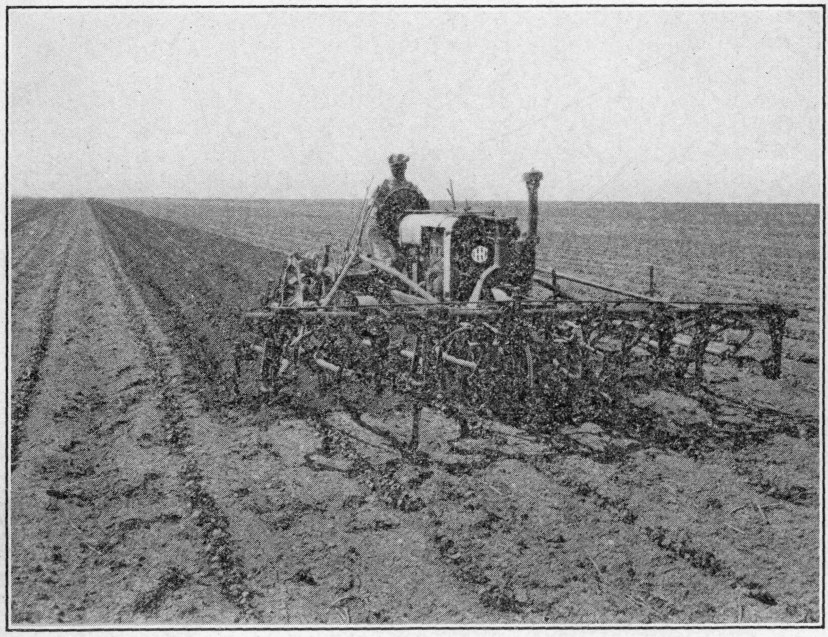

Figure 69.—Four-row implements are commonly used in the production of cotton in the Corpus Christi Cotton Area.

and in the more fertile of the narrow valleys that traverse the area. Cotton is the main crop and is grown in combinations with corn, grain sorghums, and small grains. It is in this part of the State that corn and grain sorghums overlap. Both are grown to a limited extent throughout the area, although corn predominates in the eastern and grain sorghums in the western part of the area.

The Western Cross Timbers Farming Area (Area 12)

In this area the soils are generally sandy and the topography for the most part is gently rolling. Most of the land not in cultivation has a moderately heavy covering of oak timber. More than 80 per cent of the land area is in farms, but only approximately one-third of the farm land is cultivated. Although cotton is the leading crop, it occupies, on the average, only one-third of the cultivated area. The balance of the cropping systems are made up of corn, grain sorghums, small grains, and hay and other forage crops. Peaches, watermelons, and peanuts are important crops in certain limited portions of the area.

Livestock and livestock products are produced for home use and for sale as the available pasture and feed crops permit. Cattle, dairy products, poultry, and eggs are the principal products.

The character of farming in this area has been greatly changed since 1914. Previous to that time, cotton occupied about two-thirds of the cultivated area and was the only important source of income. Since that time, the annual production of cotton has averaged about one-third of the production of the previous 15 years. People living in the area explain the decrease in cotton production in terms of reduced yields due to heavy insect damage. The failure of cotton yields caused farmers to turn to other enterprises. On the more sandy soils, peanuts have replaced cotton as the main cash crop. In the other sections, watermelons and peaches have been substituted for cotton. For the most part, however, the feed crops listed above have taken the place of cotton. The change from cotton to crops requiring less labor per acre has resulted in a gradual increase in the size of farms and in the production of certain types of livestock, particularly dairy cattle and poultry.

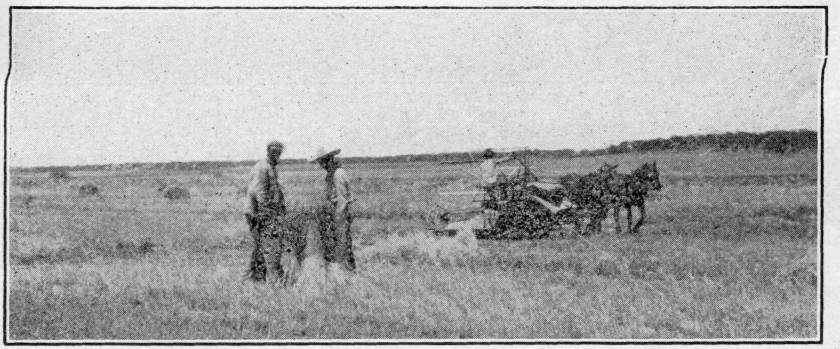

Figure 70.—Small grains compete successfully with cotton in the cropping systems on farms in the Grand Prairie.

Grand Prairie Area (Area 13)

Mixed types of farming characterize the agriculture of this area. Ranching, cotton production, and small-grain production are the main types. The distribution of these various types throughout the area are conditioned by variations in soils and topography. The surface generally is quite rolling and broken. The soils, mostly dark clays and clay loams, vary from shallow stony soils, low in fertility, to deep, black, highly productive soils. On the deeper and more productive soils the system of farming followed is centered on cotton production and closely resembles the agriculture of the Black Prairies immediately to the east. The shallow soils that are in cultivation are reasonably fertile but droughty. These soils are used largely for the production of winter grains, for which they seem to be better adapted than for cotton. Grain sorghums and corn are grown as supplementary crops on both types of land. Wherever large

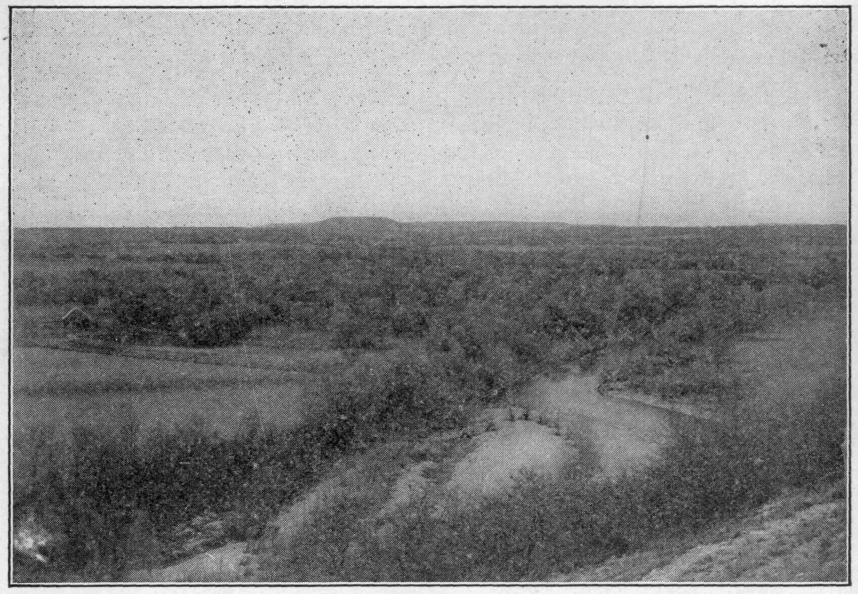

Figure 71.—A typical landscape in the southern part of the Grand Prairie. The broken, stony, and brush-covered portions are grazed by cattle, sheep, and goats.

bodies of the more shallow and broken lands are found, the main enterprise is ranching.

That portion of the area designated in Figure 55 as 13a and commonly referred to as the Fort Worth Prairie is differentiated by the fact that wheat and oats are of about equal importance in the cropping systems, whereas in the other subdivisions of the area oats make up the greater part of the small-grain acreage. There is also a higher proportion of land in cultivation in this part of the area.

The chief difference between the remaining two sub-areas is the greater importance of ranching in 13c as compared with 13b. In Sub-area 13c a variety of grass and brush (or browse) is the basis for a system of ranching, involving cattle, sheep, and goats, that closely resembles the type of ranching in the adjoining Edwards Plateau Grazing Area.

Black Prairie Area (Area 14)

The agriculture in this area is characterized by a high degree of specialization in cotton production. Cotton occupies approximately two-thirds of the cultivated land and is the source of about 90 per cent of the cash farm income. Corn ranks second to cotton in acreage and is grown generally throughout the area, occupying 10 to 20 per cent of the cultivated land. The rest of the cultivated area is devoted primarily to small grains, hay, and other forage crops. Wheat is important only along

Figure 72.—Cotton and corn are the main crops in the Black Prairie Area.

the western side of the area as far south as Dallas County. Oats are produced to a limited extent throughout the area, but are also grown more extensively in the northwestern part of the area and are an important crop as far south as Bell County. Livestock are of minor importance except around the cities, where dairy products and poultry are produced on a fairly large scale for local consumption.

Figure 73.—A typical harvesting scene in the State's principal cotton-producing area, the Black Prairie. (Photograph furnished by the Texas Agricultural Extension Service.)

The Black Prairie includes that large body of soil commonly known as the Black Waxy Prairie, and the minor interior prairies sometimes referred to as the upper coast prairie. The soils are mostly black and dark-brown clays that are highly calcareous and of great natural fertility. Sub-area 14a includes the main body of these soils and is differentiated from the rest of the area by reason of small-grain production that is practically nonexistent in Sub-areas 14b and 14c. Although the dominant soil types in Sub-area 14c are similar to those in the rest of the area, they are intermingled to a greater extent with sandy, oak-covered lands that are used primarily for grazing. As a consequence, livestock production tends to be relatively more important and feed crop production occupies a larger place in the cropping system than in the area generally.

Northeast Sandy Lands Area (Area 15)

Farming in this area is characterized by small farms, small, irregular-shaped fields, small, simple tools, and the use of comparatively large amounts of commercial fertilizer as compared with other farming areas in the State. It is further characterized by a basic cropping system of cotton and corn that is supplemented in various parts of the area with a wide variety of special crops, mainly vegetables. Other crops that are grown rather generally throughout the area are cowpeas, sorghums, peanuts.

Figure 74.—Small, irregular-shaped fields and the use of small implements characterize the farming in the Northeast Sandy Lands Area.

sweet potatoes, and watermelons. It is a common practice to inter-plant cowpeas in alternate rows with corn.

Livestock are kept primarily for home consumption on the great majority of farms in the area.

Some fairly large bodies of commercial timber are still found in certain parts of the area. There are also small amounts of timber on the majority of farms. These provide fuel for the farm and supplemental income from the sale of cross ties, poles, and fire wood.

The physical characteristics of the area are conducive to small-scale operations. The soils are sandy, the surface is generally rolling, and the rainfall averages between 40 and 45 inches. Timber covers most of the land not in cultivation and persistently encroaches on the cultivated area.

The area is subdivided on the basis of characteristic timber growth and related differences in soil types. Sub-area 15a represents the pine-covered and Sub-area 15b the oak-covered portions of the area. Sub-area 15b is less rolling and more open than Sub-area 15a. The rainfall is somewhat less, the farms are somewhat larger, and fewer special crops are grown. The basic cropping system of cotton and corn prevails in both sub-areas, however, with cotton occupying approximately the same percentage of the total cultivated area.

Piney Woods Lumbering Area (Area 16)

This area together with Sub-area 15a comprises the piney-woods section of Texas. Loblolly and long-leaf pine are the main timber types in

Figure 75.—Lumber production, mainly pine, is the principal industry in the Piney Woods Lumbering Area.

this area, whereas short-leaf pine is the prevailing type in Sub-area 15a. This area is further distinguished from Area 15a by the fact that lumbering is the major industry, with farming of only minor importance. Such farming as is done is quite similar to that in Sub-area 15a, in that cotton and corn occupy most of the crop land while annual legumes and vegetables account for the balance of the cultivated area. Free range from large areas of cut-over land forms the basis for the production of large numbers of low-grade beef cattle and hogs. The entire area is tick-infested, making it difficult to improve herds from outside sources.

Farms are somewhat smaller than in Sub-area 15a, but this is offset by supplementary incomes from range livestock, from larger sales of forest products, and from labor off the farms in nearby forests and saw mills.

Post Oak Area (Area 17)

This area lies entirely within the post-oak portion of the East Texas timber country. The soils are mostly sandy, with the surface gently rolling and largely covered with a growth of oak timber. The annual rainfall averages about 35 inches. Scattered throughout the area are small interior prairies with fairly productive soils. Several rivers, including the Brazos and Colorado, cross the area. The bottom lands along these rivers are highly productive and are used very largely for cotton production under the plantation system. A large proportion of the cultivated land in this area is found in these prairies and river bottoms. Cotton, which normally occupies about two-thirds, and corn, occupying about one-fifth of the cultivated area, with a small acreage of hay and other forage crops, make up the cropping systems on the great majority of farms in the area. In Sub-area 17b, vegetable production featuring tomatoes and watermelons is substituted for a part of the cotton acreage.

Almost three-fourths of the area is in pasture land that is used primarily for cattle ranching. Livestock production on farms is largely for home consumption.

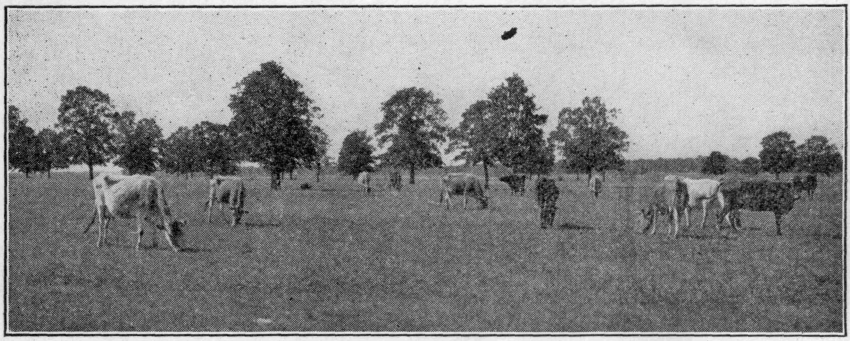

Figure 76.—A large proportion of the land in the Post Oak Area is used for grazing. (Photograph furnished by Texas Agricultural Extension Service.)

Coast Prairie Area (Area 18)

This is a low-lying, practically flat area in which varying soil types and conditions of drainage have resulted in mixed types of farming. The soils can be roughly classed into three groups: dark clays and clay loams, light-colored soils largely sandy in character, and the alluvial soils deposited by the Brazos and Colorado Rivers and other smaller streams that cross the area. Large portions of the area can be used for little other than grazing, unless systematically drained.

The main types of farming are cattle ranching, to which approximately 71 per cent of the land area is devoted; cotton and corn production, confined very largely to the better-drained dark-clay and alluvial soils; and rice production. Dairying and the production of fruits and vegetables are important enterprises in limited areas around the larger cities.

Rice production is largely confined to fertile lands with impervious subsoils that permit economical irrigation. Land on which rice is grown is usually cultivated one year and then stands idle for a year or two. This practice has led to a combination of beef cattle raising and rice farming, with the cattle kept to utilize the rice lands during the years in which they are not cultivated.

The area is subdivided on the basis of the distribution of these main types of farming. In Sub-area 18a, cattle ranching is practiced to the exclusion of all other types. In Sub-area 18b, all three types are found. Most of the cotton produced in the coast prairie is grown in this portion of the area. It is also the source of more than half of the rice produced in the State. In addition, more than half of the land in this sub-area is still devoted to cattle ranching. An exception to these main types of farming is the production of early potatoes in parts of Colorado, Fort Bend, and Wharton Counties. Cattle ranching and rice production are

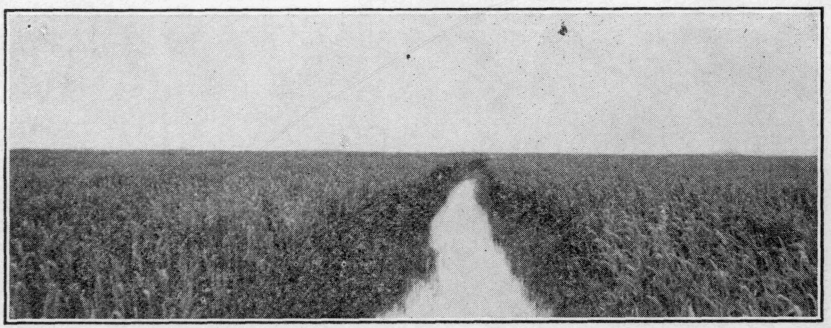

Figure 77.—Rice is grown to the exclusion of all other cultivated crops in parts of the Coast Prairie.

the principal forms of land use in Sub-area 18c. Cotton production is of minor importance. Dairy products, fruits, and vegetables are produced in important quantities around the cities of Houston, Galveston, and Beaumont.