INTRODUCTION

This summary outlines the importance of irrigation for agricultural purposes, and indicates the characteristics of irrigation enterprises and irrigated farms.

Definitions and explanations.—Definitions and explanations are given only in general terms in this summary. Detailed definitions and explanations regarding irrigated farms and irrigation enterprises will be found in Volume II, "General Report—Statistics by Subjects," and in Volume III, "Irrigation of Agricultural Lands," of the reports of the 1950 Census of Agriculture. The terms most commonly used throughout this report follow.

A farm.—For the 1950 Census of Agriculture, places of 3 or more acres were counted as farms if the value of agricultural products in 1949, exclusive of home gardens, amounted to $150 or more. The agricultural products could have been either for home use or for sale. Places of less than 3 acres were counted as farms only if the value of sales of agricultural products in 1949 amounted to $150 or more. Places operated in 1949 for which the value of agricultural products in 1949 was less than these minima because of crop failure or other unusual situations, and places operated in 1950 for the first time were counted as farms if normally they could be expected to produce these minimum quantities of farm products.

All the land under the control of one person or partnership was included as one farm. Control may have been through ownership, or through lease, rental, or cropping arrangement.

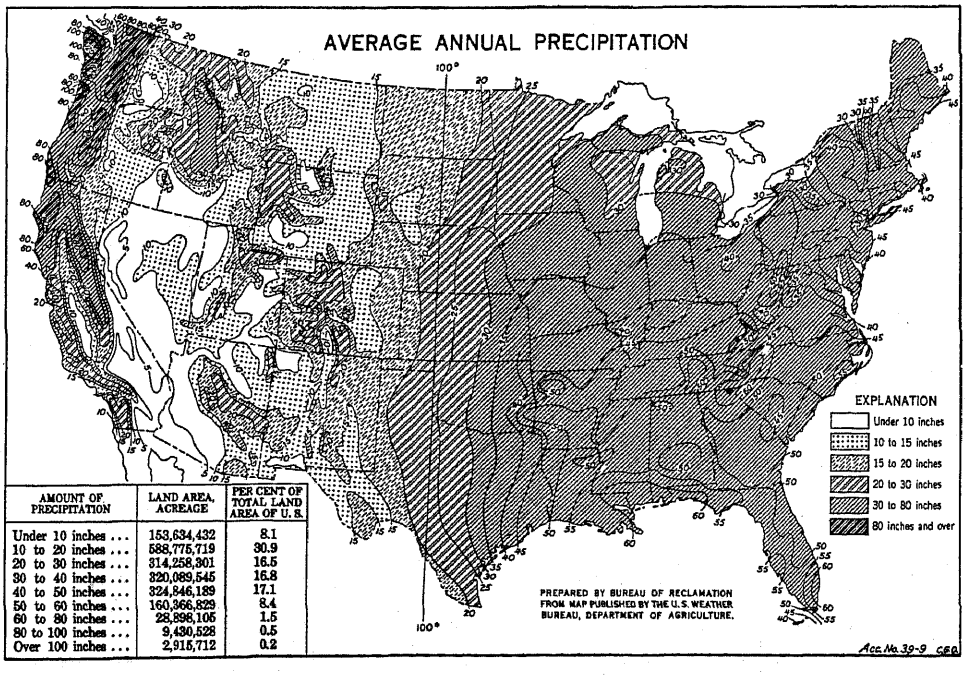
Irrigation enterprise.—An irrigation enterprise is a business, either private or public, that operates irrigation works to supply water for irrigation. Thus an individual farm, a cooperative arrangement of two or more farmers, or a commercial company, irrigation district, or any other organization that operates irrigation supply works, is an irrigation enterprise.

Nearly all of the information presented in this report is based upon the decennial and quinquennial censuses and hence relates only to 1 year in each 5- or 10-year period. Some data are presented for the years between censuses in order that the conditions in years covered by the census can be compared with those for the intervening years.

Many of the data in the report relate only to the 17 Western States and Arkansas, Louisiana, and Florida. These 20 States were covered by the special Censuses of Irrigation for 1940 and 1950. For the irrigation censuses prior to 1940, no information on irrigation was obtained for Florida. For the States in which the special censuses of irrigation have been taken, additional data on irrigation farming have been obtained through the census of agriculture. Limited data pertaining to irrigation are available from the 1950 Census of Agriculture for the 28 States not covered by the 1950 Census of Irrigation.

Importance of irrigation.—Irrigation plays an important part in agricultural production in the United States. Irrigation is practiced on more than 305,000 farms. Approximately one-eighth of the value of all crops harvested in the United States comes from irrigated land. Irrigated farms comprise 5.7 percent of all farms and irrigated land represents 2.2 percent of all land in farms in the United States. Irrigated cropland comprises 6.2 percent of all cropland harvested in the United States.

Irrigation and precipitation.—In most areas of the Nation, the amount and seasonal distribution of rainfall determines the necessity for irrigation. For many years, areas with less than 20 inches of rainfall annually were considered as requiring irrigation for maintaining crops. While "dry farming" is carried on in many places in which the annual precipitation is considerably below 20 inches and crops often fail in sections where the rainfall exceeds 20 inches, the line of 20 inches rainfall, which approximates the 100th meridian, separates the important irrigation area from the area where irrigation is not generally practiced. The area that has less than 20 inches of precipitation contains two-fifths of the land area of the United States. However, much of this area is in mountains and deserts. The area also contains large amounts of semiarid and arid lands that have little or no agricultural use except for grazing or except as such lands can be supplied with water by irrigation.

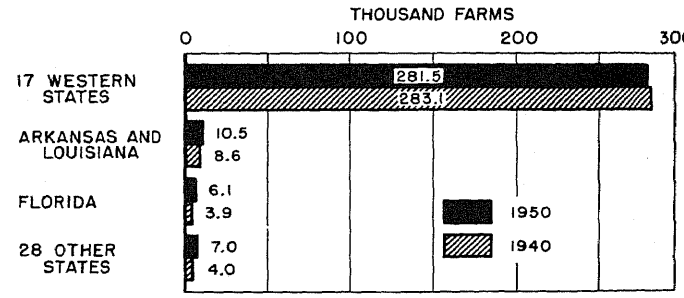


AMOUNT OF PRECIPITATION	LAND AREA, ACREAGE	PER CENT OF TOTAL LAND AREA OF U. S.
Under 10 inches ...	153,634,432	8.1
10 to 20 inches ...	588,775,719	30.9
20 to 30 inches ...	314,258,301	16.5
30 to 40 inches ...	320,089,545	16.8
40 to 50 inches ...	324,846,189	17.1
50 to 60 inches ...	160,366,829	8.4
60 to 80 inches ...	29,296,105	1.5
80 to 100 inches ...	9,430,528	0.5
Over 100 inches ...	2,915,712	0.2

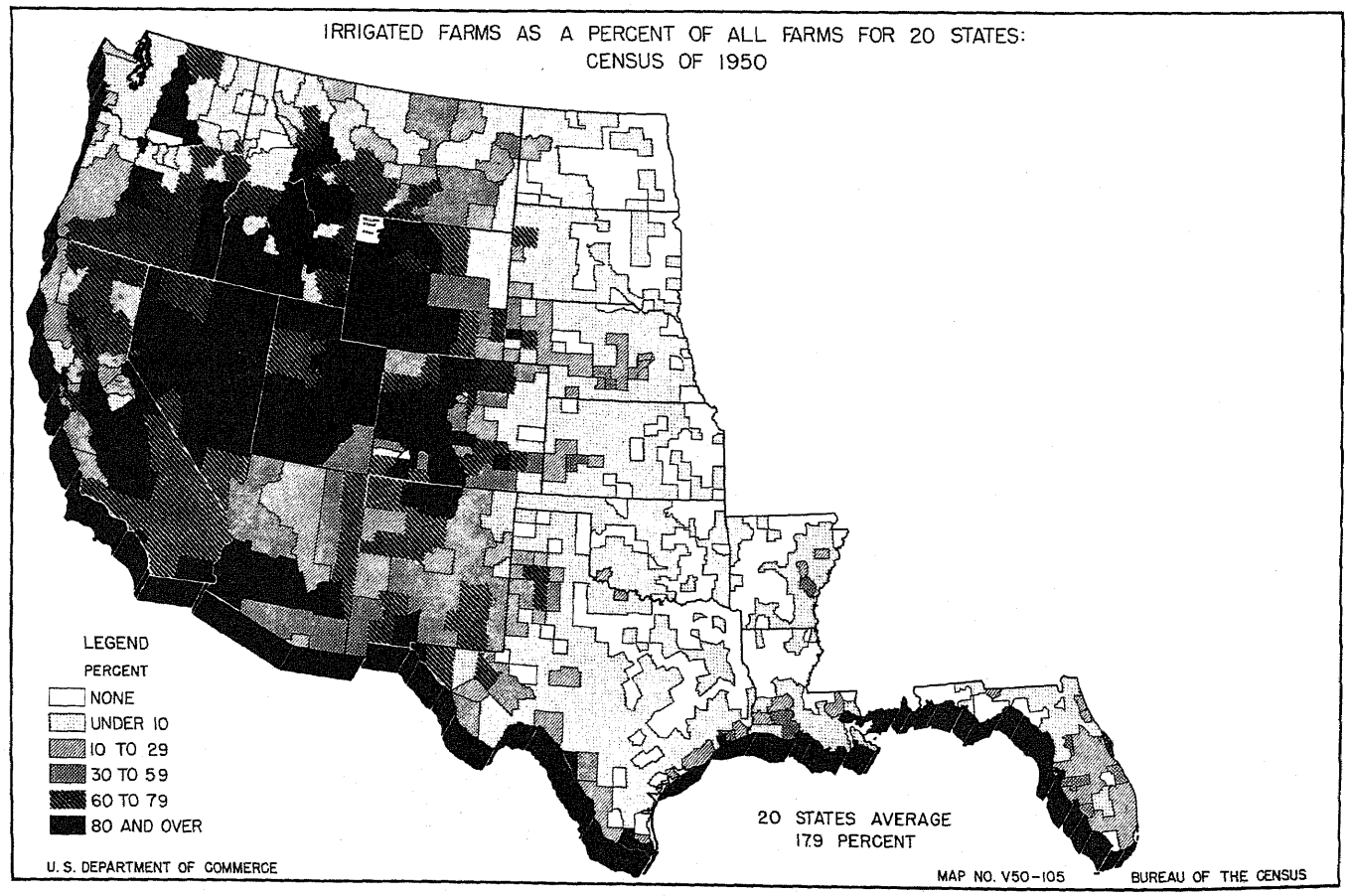
The important area of irrigation extends from the Dakotas southward to Texas and westward to the foothills of the Cascade Mountains in southern Oregon and to the Coast Range in California. While this area of less than 20 inches of annual precipitation is the area where irrigation is normally used, it contains large sections where wheat and other grain crops are regularly grown without irrigation, and small sections where other crops are grown on nonirrigated land.

The crop farming of Arizona, California, Colorado, Indiana, Montana, Nevada, New Mexico, Utah, and Wyoming is largely dependent upon irrigation, although these States have a considerable acreage of grain and forage crops grown without irrigation. The Coast States of California, Oregon, and Washington have zones west of the Coast Range and Cascade Mountains where the purpose of irrigation is largely to supplement natural precipitation. East of the Coast Range in California and east of the Cascades in Oregon and Washington, the importance of irrigation for crop production is similar to that in the Mountain States. The eastern part of the States of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas, includes an area where irrigation plays a less but an increasingly important role in crop production, particularly in excessively dry years.

NUMBER OF IRRIGATED FARMS IN SPECIFIED AREAS OF THE UNITED STATES: 1950 AND 1940
(CENSUS OF AGRICULTURE)



earlier. For the 17 Western States, the number of farms for which irrigated land was reported was about 1 percent less in 1950 than in 1940. During this 10-year period, the number of all farms declined 15 percent in the 17 Western States. The number of farms with irrigated land was 23 percent greater in 1950 than in 1940 in Arkansas and Louisiana where irrigation is used

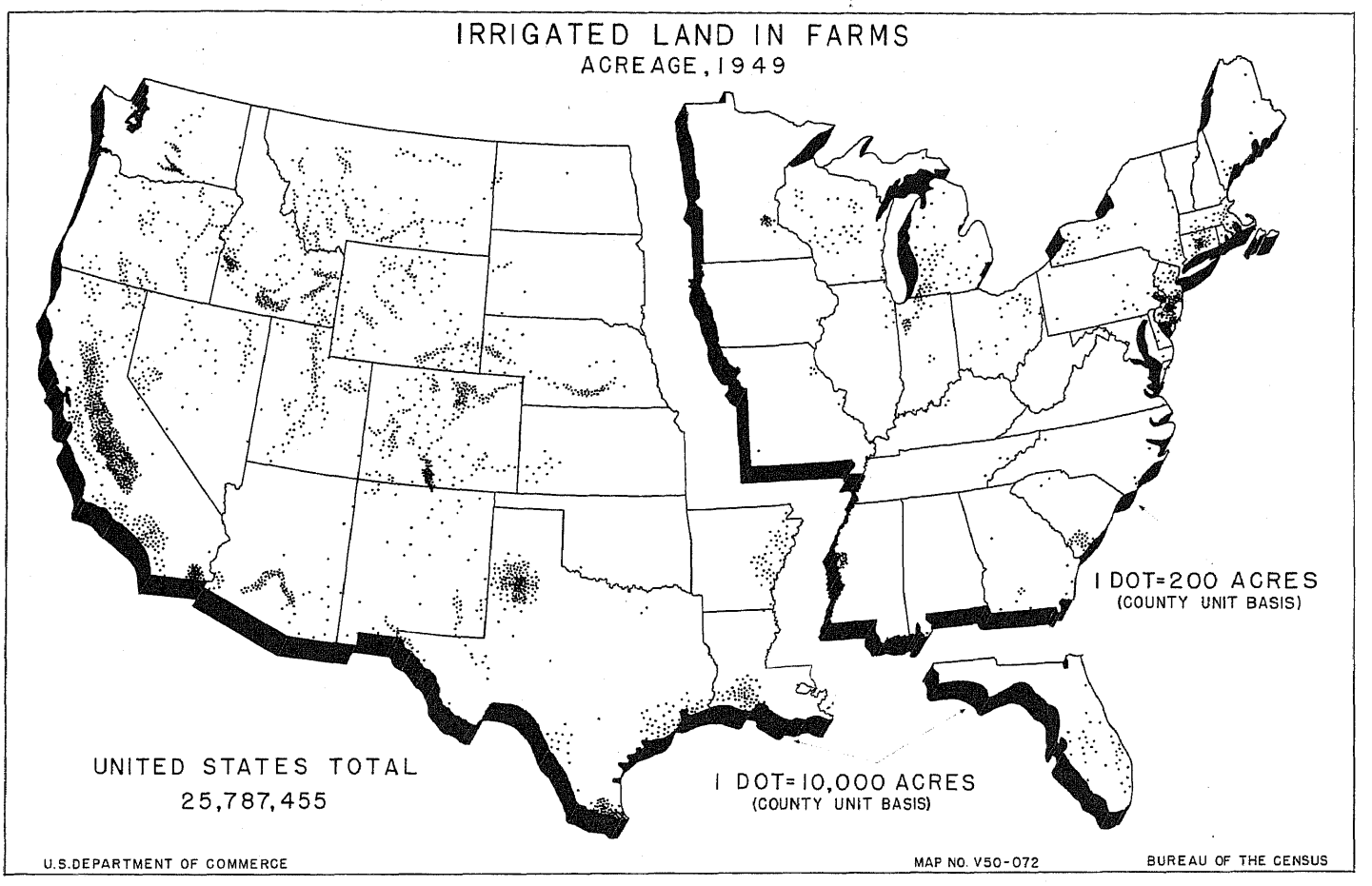


Irrigated farms.—For the United States, the number of irrigated farms was over 305,000 in 1950. Thus, 1 out of 18 farms used irrigation. Irrigated farms in relation to all farms are most important in the 17 Western States. In all other States except Arkansas, Louisiana, and Florida, irrigation was used on less than 1 percent of the farms, according to the 1950 Census of Agriculture.

Change in the number of irrigated farms.—Irrigated land was reported for about 2 percent more farms in 1950 than 10 years

largely for the growing of rice, 54 percent greater in Florida, and 75 percent greater in the 28 other States.

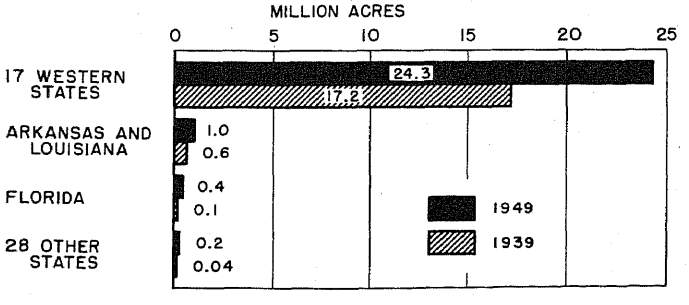
Irrigated land.—The total area of irrigated land in 1949 was about 26 million acres. Irrigated land in farms in 1949 amounted to 2.2 percent of all land in farms in the United States. In the 17 Western States, irrigated land represented 3.5 percent of the total farm area; in Arkansas and Louisiana, it represented 3.3 percent; in Florida, 2.2 percent; and in the other 28 States, less than a half of 1 percent of all land in farms.



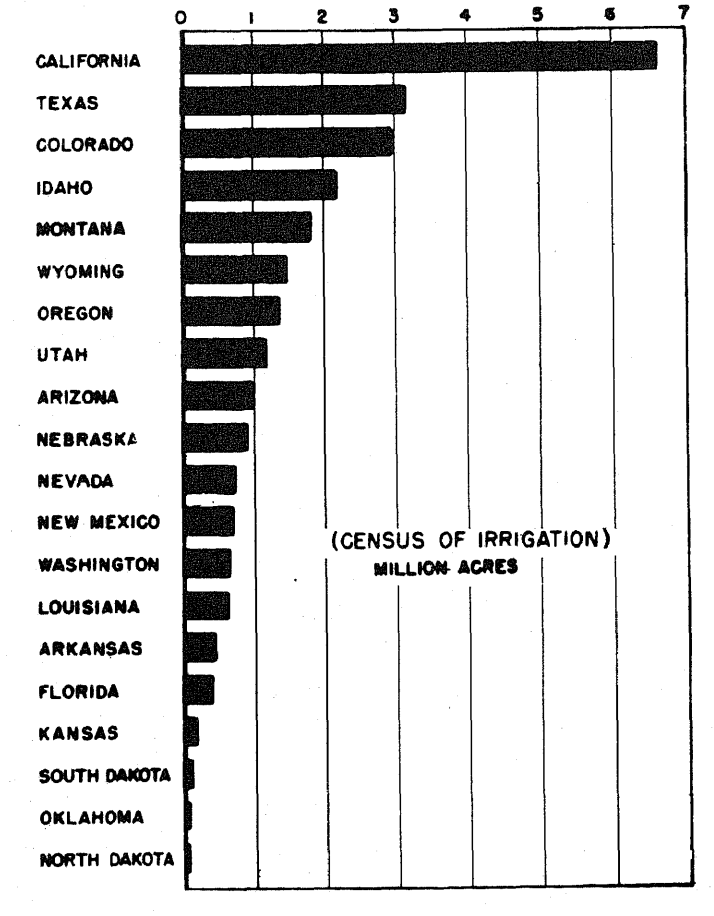
More than 94 out of every 100 acres of irrigated land are in the 17 Western States. About 4 out of every 100 acres are in Arkansas and Louisiana, 1 out of 100 acres in Florida, and less than 1 out of 100 acres in the remaining 28 States.

California, with 6.4 million acres, had the largest area of irrigated land of any State, or 25 percent of the total for the United States; Texas was second with 3.1 million acres; and Colorado, third with 2.9 million. Among the 28 States other than the 17 Western States and Arkansas, Louisiana, and Florida, New Jersey was first with 28,117 acres; New York second, with 19,248; and Massachusetts third, with 18,507. Some irrigated land was reported for every State.

ACREAGE OF IRRIGATED LAND IN FARMS IN SPECIFIED AREAS OF THE UNITED STATES: 1949 AND 1939 (CENSUS OF AGRICULTURE)



ACREAGE OF IRRIGATED LAND BY STATES



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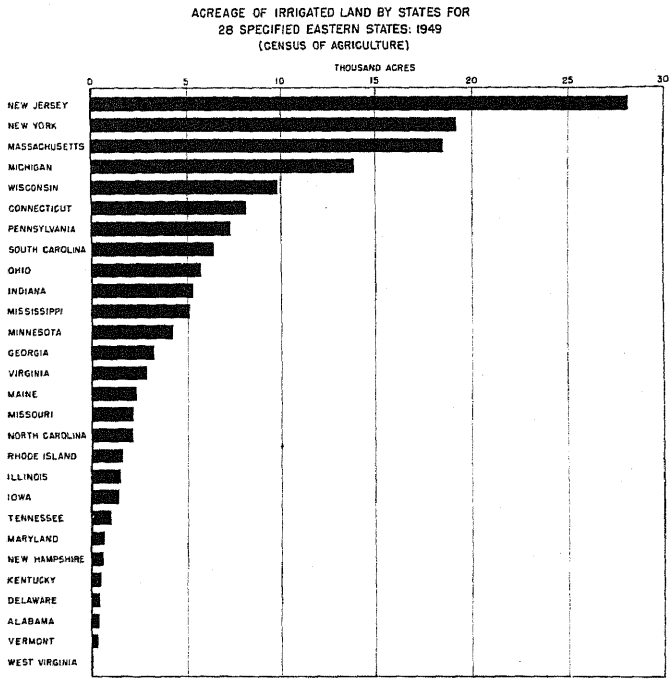
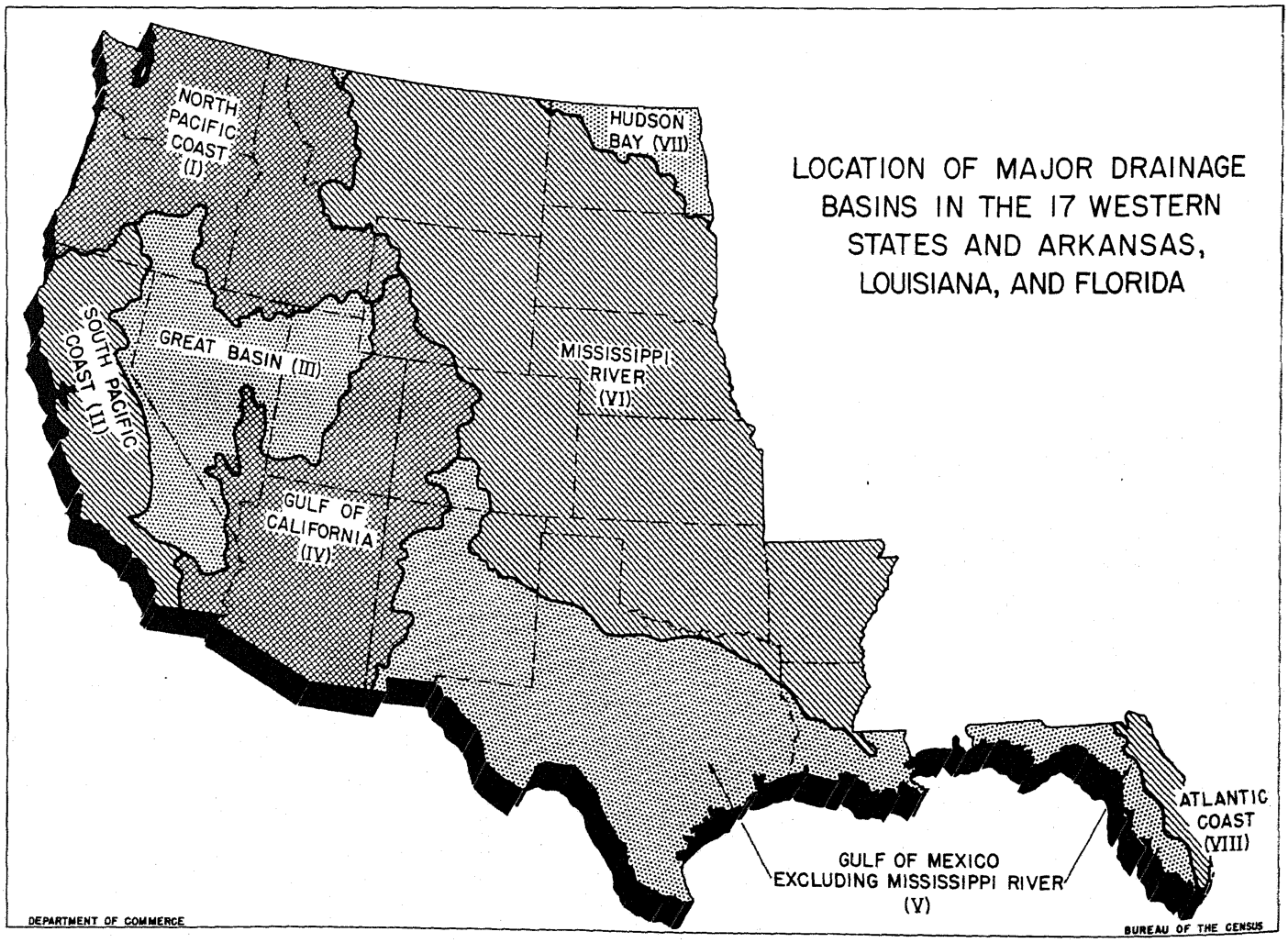


The acreage of irrigated land outside the West, and Arkansas, Louisiana, and Florida totals only 152,586 acres. However, irrigation is becoming increasingly important in the humid areas. Outside the 17 Western States, Arkansas, and Louisiana, the area irrigated in 1949 was 352,000 acres greater than in 1939.

The map below outlines the area in the eight major drainage basins. The North Pacific Coast Basin includes the Columbia River Basin. The South Pacific Coast Basin includes the basins from the Klamath River south to the Santa Maria River, including the river basins in the Central Valley area of California. The Great Basin includes the intermountain areas including the basins of the Humboldt, Bonneville, and Bear Rivers. The Gulf of California Basin comprises largely the basins of the Colorado River and its tributaries. The Mississippi River Basin, by far the largest, comprises all of five States and parts of seven additional States. The basin of the Gulf of Mexico, excluding the Mississippi River, includes the basins of the Rio Grande, Mermentau, and other rivers with discharges into the Gulf of Mexico. The Hudson Bay Basin includes only the basin of the Red River of the North. The Atlantic Coast Basin comprises only the areas in Florida.

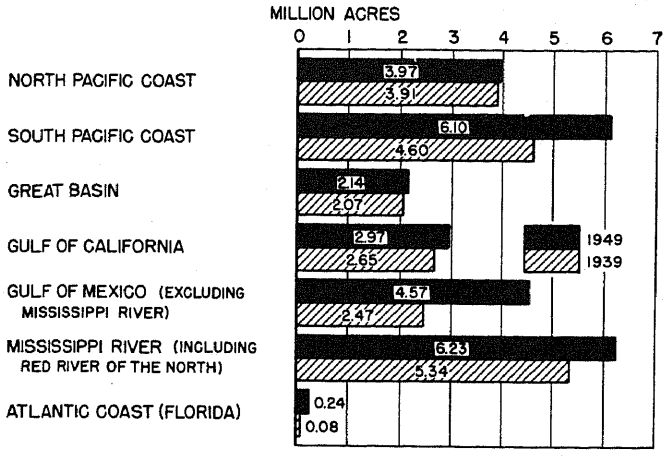
Irrigated land by drainage basins.—By the major drainage basins the largest acreage of irrigated land in 1949 as shown by the Census of Irrigation, was in the Mississippi River Basin, with 6.2 million acres; and the second largest in the South Pacific Coast Basin, with 6.1 million. The largest increase from 1939 to 1949 was in the Gulf of Mexico Basin excluding the Mississippi River, from 2.5 to 4.6 million acres, chiefly as a result of the large increase in Texas. The second largest increase was in the South Pacific Coast Basin, from 4.6 to 6.1 million acres, chiefly as a result of the large increase in California.

Changes in irrigated land.—The 26 million acres of irrigated land in the United States in 1949 represented an increase of



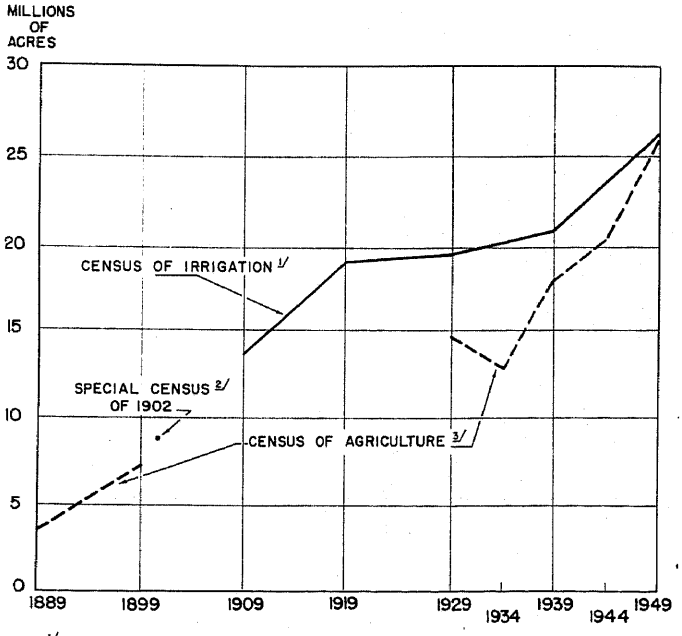
ACREAGE OF IRRIGATED LAND BY MAJOR DRAINAGE BASINS IN THE 17 WESTERN STATES AND ARKANSAS, LOUISIANA, AND FLORIDA: 1949 AND 1939

(CENSUS OF IRRIGATION)



43 percent over the acreage for 1939. Increases were reported for every State except Iowa, Nevada, and West Virginia. The largest increase, from 0.9 to 3.1 million acres, was in Texas; the second largest, from 4.3 to 6.4 million acres, in California; and the third largest, from 2.5 to 2.9 million acres, in Colorado. Excluding States in which less than 1,000 acres of irrigated land were reported for 1939, the largest proportionate increase, from 2,049 to 18,507 acres, was in Massachusetts; the second largest, from 4,437 to 34,071 acres, was in Oklahoma; and the third largest, from 2,960 to 13,901 acres, in Michigan.

ACREAGE OF IRRIGATED LAND IN THE UNITED STATES: 1889 TO 1949



1/ TOTAL IRRIGATED LAND IN FARMS. FOR 1909, 1919, AND 1929, IRRIGATION CENSUS INCLUDED THE 17 WESTERN STATES AND ARKANSAS AND LOUISIANA; FOR 1939 AND 1949, FLORIDA ALSO INCLUDED.

2/ TOTAL IRRIGATED LAND, ALL STATES.

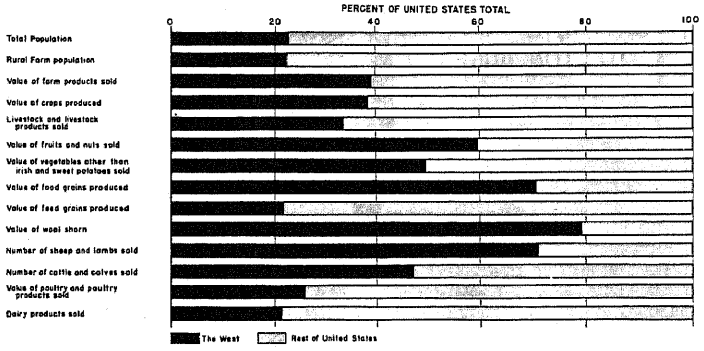
3/ FOR 1889 AND 1899, CENSUS TOTAL FOR IRRIGATED LAND IN FARMS INCLUDED THE 17 WESTERN STATES, ARKANSAS AND LOUISIANA; FOR 1929, IRRIGATED LAND FROM WHICH CROPS WERE HARVESTED, SAME 19 STATES; FOR 1934, IRRIGATED CROPS, SAME 19 STATES; FOR 1939, IRRIGATED CROPLAND HARVESTED PLUS IRRIGATED PASTURE, 48 STATES; FOR 1944 AND 1949, TOTAL IRRIGATED LAND 48 STATES. DATA FOR 1909 AND 1919 NOT AVAILABLE.

The increases in irrigated land from 1939 to 1949 as shown by the Census of Agriculture, in general, overstate the increases that actually occurred, because the reporting of irrigated land was more nearly complete in the 1950 than in the 1940 Census. However, for the country as a whole, a greater increase in irrigated land occurred in the period from 1939 to 1949 than in any previous decade. The big increase in Texas was caused largely by ground-water development in the High Plains area and that in California by ground-water development in the San Joaquin Valley.

Early records reveal that prior to 1860 at least 752 irrigation enterprises had been established to supply water to 402,000 acres. The first Census of Irrigation was taken in 1890 and showed 3,715,945 acres of land irrigated. The figures for censuses prior to 1940, with the exception of the special Irrigation Census of 1902, are for only the 17 Western States and Arkansas and Louisiana. However, the 17 Western States, Arkansas, and Louisiana had more than 99 percent of the total irrigated land in farms for the United States, as the other 29 States accounted for less than 1 percent of the total even as late as 1940.

The differences in 1949 between the figures for irrigated land as shown by the Census of Agriculture and the Census of Irrigation are much smaller than those shown by the two Censuses in 1939. The procedures used for the 1950 Census of Irrigation resulted in the elimination of duplication and overestimation of acreage irrigated in the reports of irrigation enterprises. A further factor that reduced the differences in the figures for the two censuses was the more complete reporting of the acreage irrigated in 1949 than in 1939 by the Census of Agriculture.

RELATION OF TOTALS FOR THE WEST TO UNITED STATES TOTALS FOR SELECTED ITEMS: CENSUS OF 1950



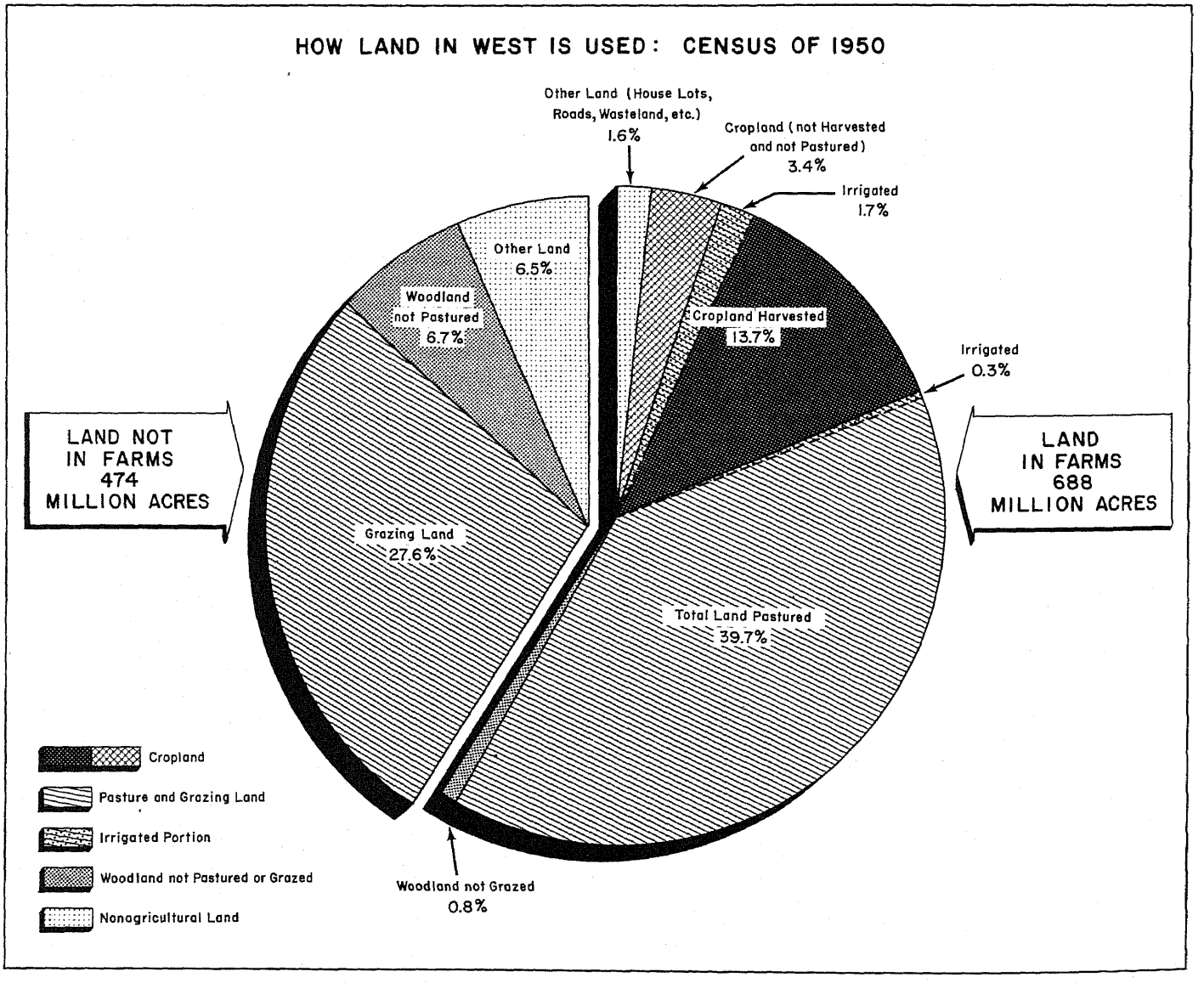
Irrigation in the 17 Western States.—Irrigation plays an important role in agricultural production in the 17 Western States or the West.

Most of the 17 Western States have too little rainfall for abundant crop production. With the exception of wheat, a large part of the crop production of these States is dependent upon irrigation. The availability of water supply has determined the location of intensive type agricultural development in these States. The areas of the West where there are large concentrations of farms are for the most part irrigated.

The 17 Western States comprise three-fifths of the area of the continental United States. They have 23 percent of the total United States population, 22 percent of the farm population, and produce over 39 percent of all farm products sold. As measured by the 1950 Census of Agriculture, these 17 States had 38 percent of all crops, one-third of the farm and ranch sales of livestock and livestock products, more than seven-tenths of all sheep and lambs sold, almost four-fifths of all domestic wool production, over seven-tenths of all food grain (wheat, rye, rice, and buckwheat) production, almost one-half of all vegetables sold, and almost three-fifths of all fruit and nut production in the United States.

Precipitation in these Western States ranges from desert conditions to more than 100 inches annually. One-eighth of the area has less than 10 inches a year. An additional one-fourth has only from 10 to 15 inches. Another one-fourth of the area has from 15 to 20 inches. About one-fifth of the area has from 20 to 30 inches, and only 15 percent of the area has 30 inches or more of rainfall annually.

In the Plains area from Canada to Mexico, most crops, and especially wheat, can be grown without irrigation provided that proper tillage and conservation practices are used. However, complete or partial crop failure is frequent. Here, irrigation alleviates drought, insures yields for most crops, and provides insurance against drought.



The yearly fluctuation in precipitation creates one of the most serious climatic risks for agriculture. In some years, the quantity and seasonal distribution of rainfall in the dry areas of the West is adequate for agricultural production. In other years, precipitation is so small that crop production is impossible. In parts of the intermountain region and the southwest, dry years occur year after year and the growing of crops without irrigation is not attempted.

Land use in the 17 Western States.—Less than three-fifths of the land in the 17 Western States is in farms, although over two-thirds of the land not in farms is used for grazing. Over two-thirds of the total area is used for grazing and only one-half of 1 percent of this land is irrigated. Only a little over 1 acre out of 7 is used for crops and only about one-eighth of the acreage used for crops is irrigated.

CHARACTERISTICS OF IRRIGATION ENTERPRISES

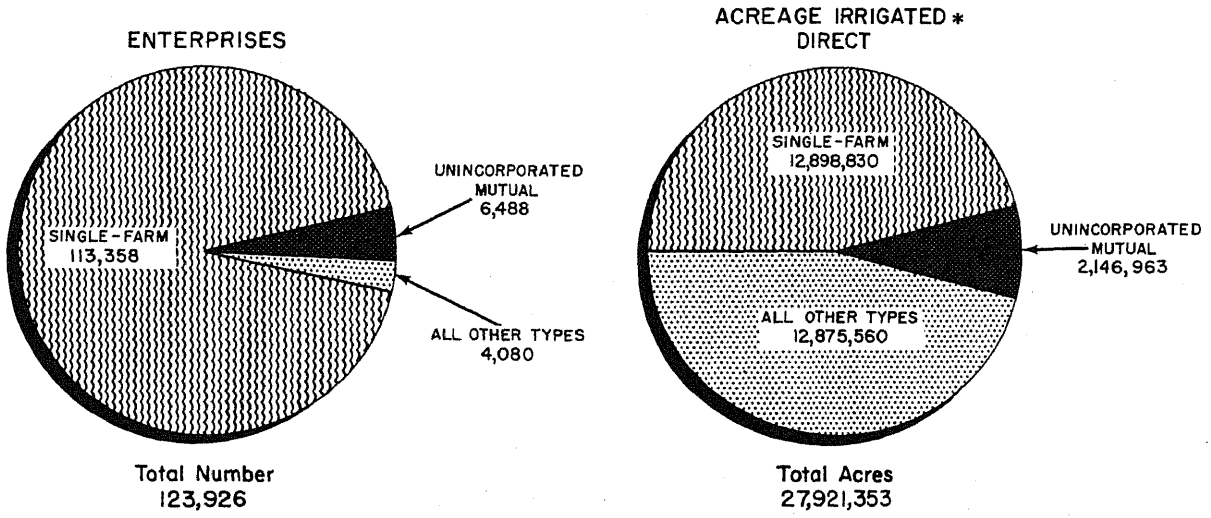
The supply and distribution of irrigation water has required the development of special organizations in many cases. Irrigation enterprises, for the purpose of this report, include farms that operate their own irrigation supply works, as well as companies, irrigation districts, and similar organizations. The information on irrigation enterprises is available only for the 17 Western States, Arkansas, Louisiana, and Florida.

Irrigation enterprises.—A total of 123,926 irrigation enterprises were reported in the 1950 Census of Irrigation for the 17 Western States and Arkansas, Louisiana, and Florida. This was an increase of 30 percent over the 95,265 reported for 1940.

Type of enterprise.—Information was obtained in the 1950 Census of Irrigation for nine types of irrigation enterprises, namely, single-farm, unincorporated mutual, incorporated mutual, commercial, district, U. S. Bureau of Reclamation, U. S. Bureau of Indian Affairs, State, and City enterprises. The number, type, and relative importance of irrigation enterprises have been changing, particularly in the West, and especially where streams are the source of irrigation water. With the increase in irrigation, stream water available for irrigation has become scarcer and scarcer and less accessible. Recent expansion in irrigation facilities except those obtaining water from ground sources required the development of larger and more costly irrigation enterprises involving the storage of water in reservoirs and the development of multiple-purpose projects for power and flood control as well as for irrigation.

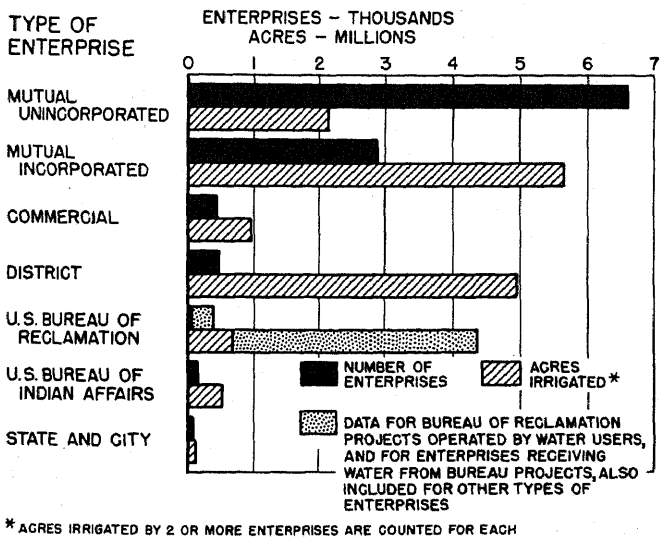
An enterprise operated by an individual farm to supply water

NUMBER OF IRRIGATION ENTERPRISES AND ACREAGE IRRIGATED DIRECT BY TYPE OF ENTERPRISE, FOR THE 20 STATES: 1949

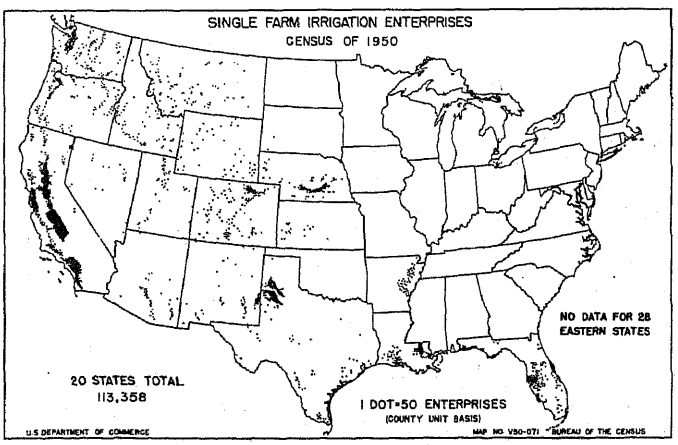


* Acreage irrigated direct by 2 or more enterprises is counted for each.

NUMBER OF ENTERPRISES AND ACREAGE IRRIGATED BY TYPES OF MULTIPLE-FARM ENTERPRISES, FOR THE 20 STATES: 1949

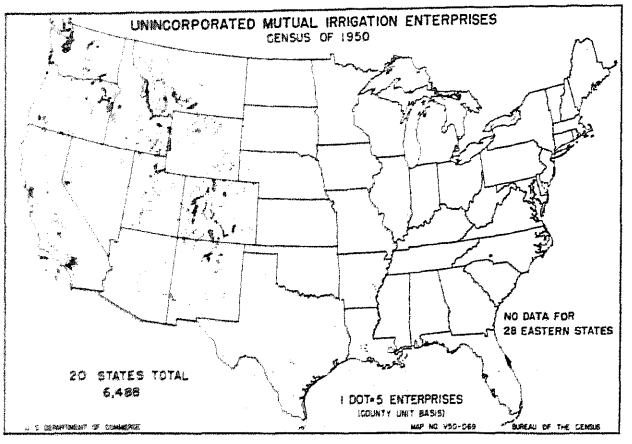


* ACRES IRRIGATED BY 2 OR MORE ENTERPRISES ARE COUNTED FOR EACH

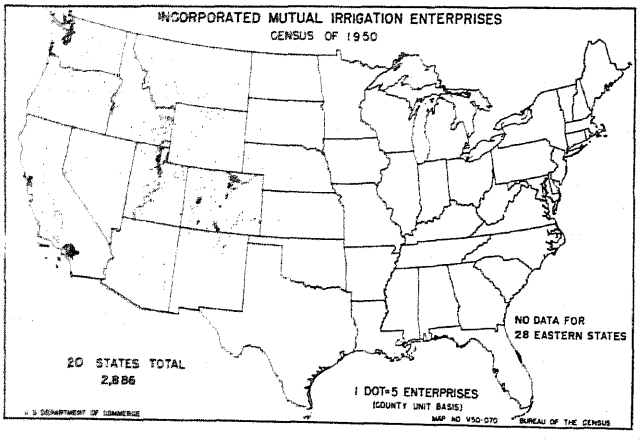


for the farm has been designated as a single-farm enterprise. Frequently, water received direct from two or more irrigation enterprises was used to irrigate the same land on many farms. In this report, the acres of land irrigated by water obtained from two or more enterprises have been counted for each enterprise. Single-farm enterprises accounted for 91 out of each 100 irrigation enterprises and provided water for about half the acreage irrigated in 1949.

All enterprises except single-farm enterprises have been designated as multiple-farm enterprises.

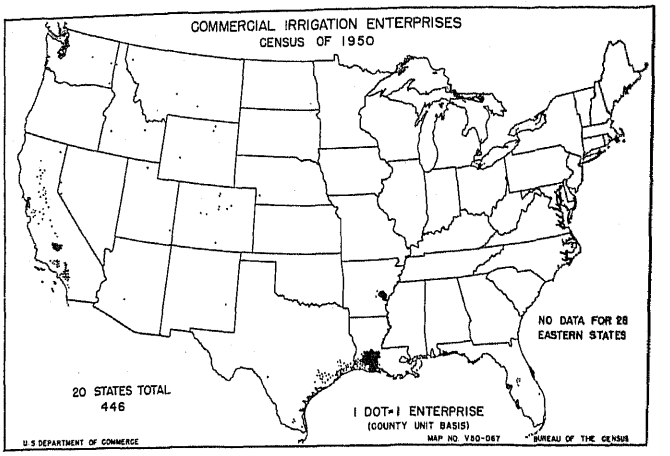


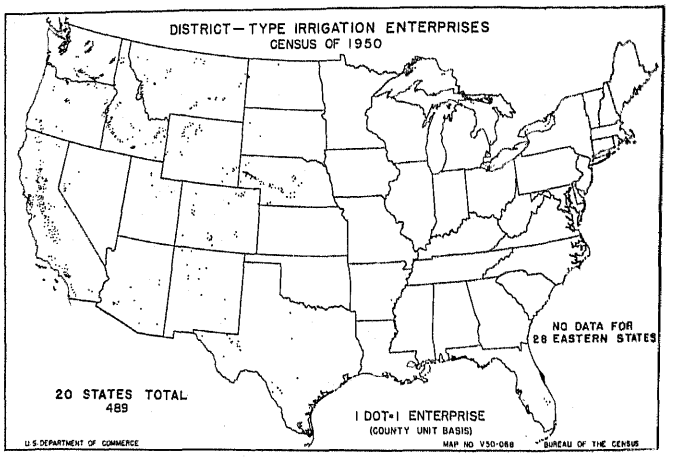
Unincorporated mutual or cooperative enterprises are controlled by the water users through written or oral agreements between members. Included in this type are those irrigation enterprises operated by two or more farmers in partnership, as well as those operated by groups of water users. There were 6,488 such enterprises in 1950 and the acreage irrigated direct by such enterprises totaled over 2 million acres.



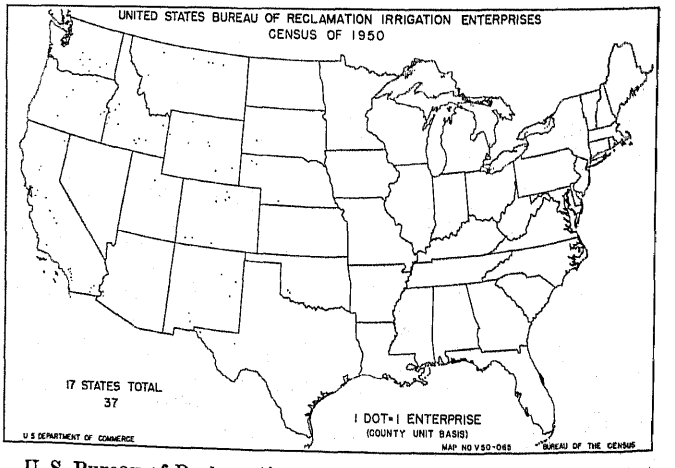
An incorporated mutual is a cooperative enterprise that has been incorporated under the law of the State in which the enterprise is located. Incorporated mutual enterprises numbered 2,886 in 1950 and the 5.6 million acres irrigated direct by these enterprises were greater than the acreage irrigated by any other type of enterprise except single-farm.

Commercial enterprises represent organizations (individuals, partnerships, and/or corporations) that sell irrigation water to farmers. Only those irrigation enterprises supplying water to water users who do not share in the control and operation of the enterprise and who have 50 percent or more of the acreage irrigated by the enterprise, are classified as commercial. Such enterprises numbered 446 in 1950, and the acreage irrigated direct by these enterprises amounted to only 964,917 acres, or 3.5 percent of the total acreage irrigated.

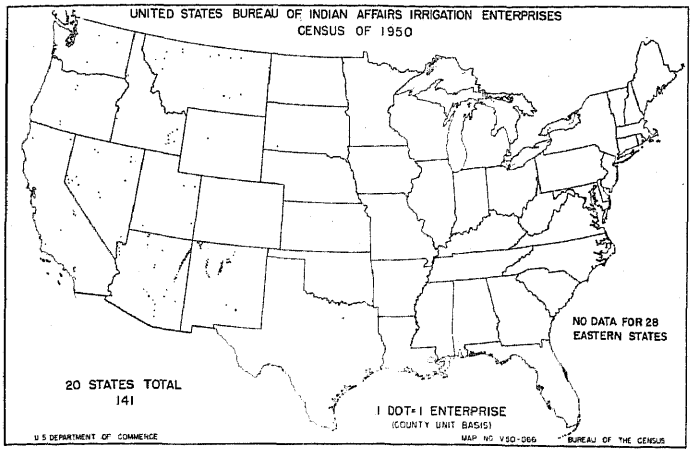




District enterprises are public corporations organized under special State laws providing the establishment of irrigation, water-improvement, water-conservation, and similar types of districts. Through taxing authority, district enterprises can levy assessments against all lands that benefit from the irrigation works within the district. District enterprises totaled 489 in 1950 and the acreage irrigated direct by such enterprises amounted to 5 million acres, or 17.8 percent of the total acreage irrigated.



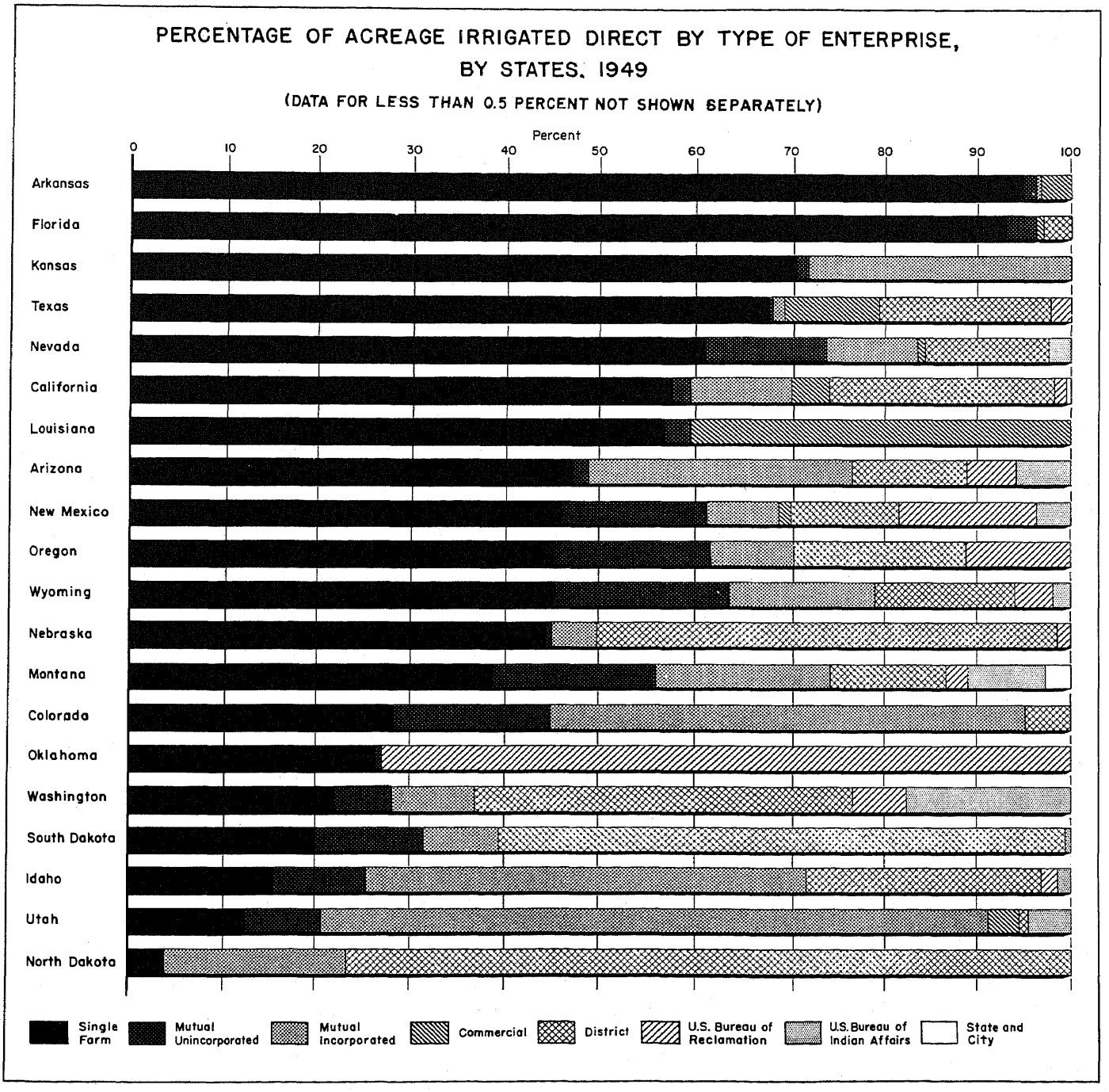
U. S. Bureau of Reclamation enterprises include only those that are operated by this Federal agency. Only 37 such enterprises, with 682,000 acres irrigated direct, were reported for 1950. However, a total of 79 projects constructed by the U. S. Bureau of Reclamation were operated by water users and these projects irrigated direct 1.5 million acres. In addition, projects constructed by the Bureau of Reclamation provided water to 247 enterprises that reported 2.2 million acres irrigated direct in 1949.



Irrigation enterprises operated by the U. S. Bureau of Indian Affairs numbered 141 in 1950 and these enterprises irrigated direct approximately one-half million acres. Some small projects constructed by the U. S. Bureau of Indian Affairs were operated by individual farms and, hence, were included as single-farm enterprises.

The number of State and City enterprises in the 17 Western States in 1950 was 81. The acreage irrigated direct by these enterprises was of little importance, totaling only slightly more than 100,000 acres. City enterprises are usually operated in combination with the supplying of water for domestic use. City enterprises providing water for less than 100 acres of farm land have been excluded.

Type of enterprise by States.—Single-farm enterprises are located in all States, but over half of the total number are found in two States—Texas and California.



Colorado, Utah, and California are the three States having the largest number of incorporated-mutual enterprises.

More than 90 percent of the acreage irrigated in Arkansas and Florida is irrigated by single-farm enterprises. More acreage is irrigated in Nebraska, North Dakota, South Dakota, and Washington by water from district enterprises than by other types. In Oklahoma, more than 7 out of every 10 irrigated acres are supplied water by enterprises operated by the Bureau of Reclamation. In Louisiana, 40 percent of the acreage irrigated is supplied water by commercial enterprises.

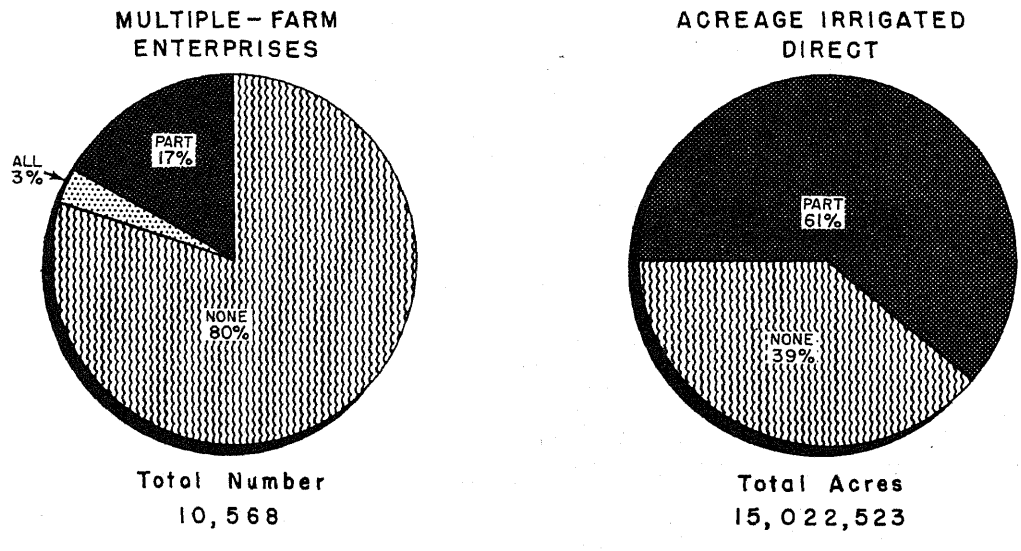
The proportion of the total acreage irrigated direct was larger for single-farm enterprises than for any other type of enterprise for each of the 8 major drainage basins except the North Pacific Coast and Hudson Bay basins. Incorporated mutual enterprises provided the largest proportion of the acreage irrigated direct for the North Pacific Coast, and the second largest for the Great Basin, the Gulf of California, and the Mississippi River basins.

Interrelationship of irrigation enterprises.—Many irrigation enterprises do not deliver all of their irrigation water direct to farms, but deliver part or all to other irrigation enterprises which may deliver it to farms, or, in turn, pass part or all on to other enterprises. In some cases, the water is passed on through several different enterprises before it reaches farms. A farm may be supplied water from one enterprise, but the water is delivered to the farm by a different enterprise. Some enterprises own no irrigation water, and obtain none from natural sources, but merely act as carriers of water for other enterprises.

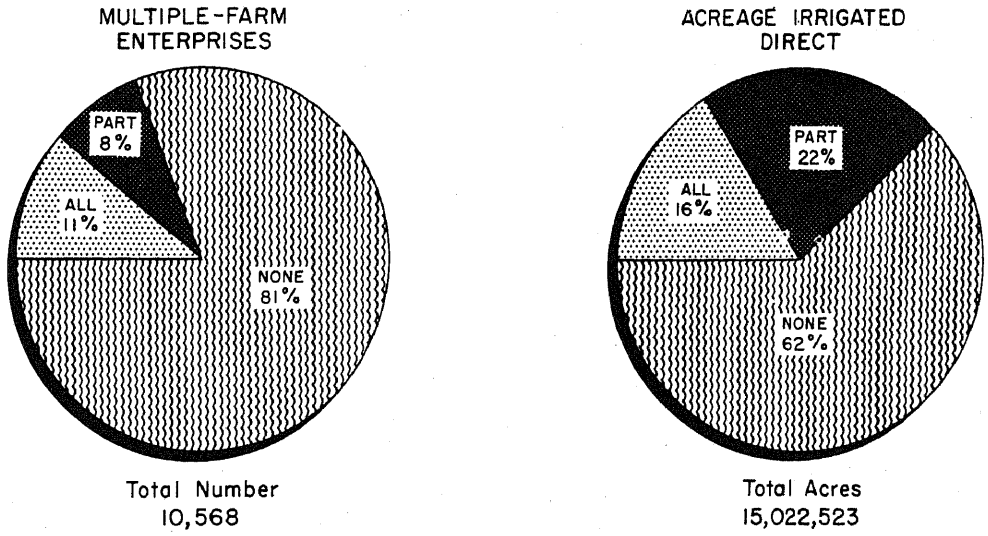
Four out of five multiple-farm irrigation enterprises did not supply water to any other enterprise in 1949. However, these enterprises on the average were the smaller enterprises as they reported less than two-fifths of the 15 million acres irrigated by multiple-farm enterprises. Slightly more than one-sixth of all multiple-farm enterprises delivered part of their water to other enterprises. Those enterprises were much larger than the average multiple-farm enterprises. They provided water for the irrigation of more than three-fifths of the total irrigated acreage for all multiple-farm enterprises. Enterprises that delivered all their water to other enterprises numbered 323 and comprised 3 percent of all multiple-farm enterprises.

More than four out of five multiple-farm irrigation enterprises did not receive any water from other enterprises. These enterprises irrigated about 5 out of 8 acres irrigated by multiple-farm enterprises. About 1 out of 12 multiple-farm enterprises obtained part of their irrigation water from other enterprises. These en-

PERCENT DISTRIBUTION OF ENTERPRISES AND OF ACREAGE IRRIGATED DIRECT FOR MULTIPLE-FARM ENTERPRISES, BY AMOUNT OF IRRIGATION WATER DELIVERED TO OTHER ENTERPRISES, FOR THE 20 STATES: 1949



PERCENT DISTRIBUTION OF ENTERPRISES AND OF ACREAGE IRRIGATED DIRECT FOR MULTIPLE-FARM ENTERPRISES BY AMOUNT OF IRRIGATION WATER RECEIVED FROM OTHER ENTERPRISES, FOR THE 20 STATES: 1949



terprises, however, reported 22 percent of the total acreage irrigated direct. Approximately 1 out of 9 enterprises obtained all their water from other enterprises. These enterprises reported about one-sixth of the total acreage irrigated direct.

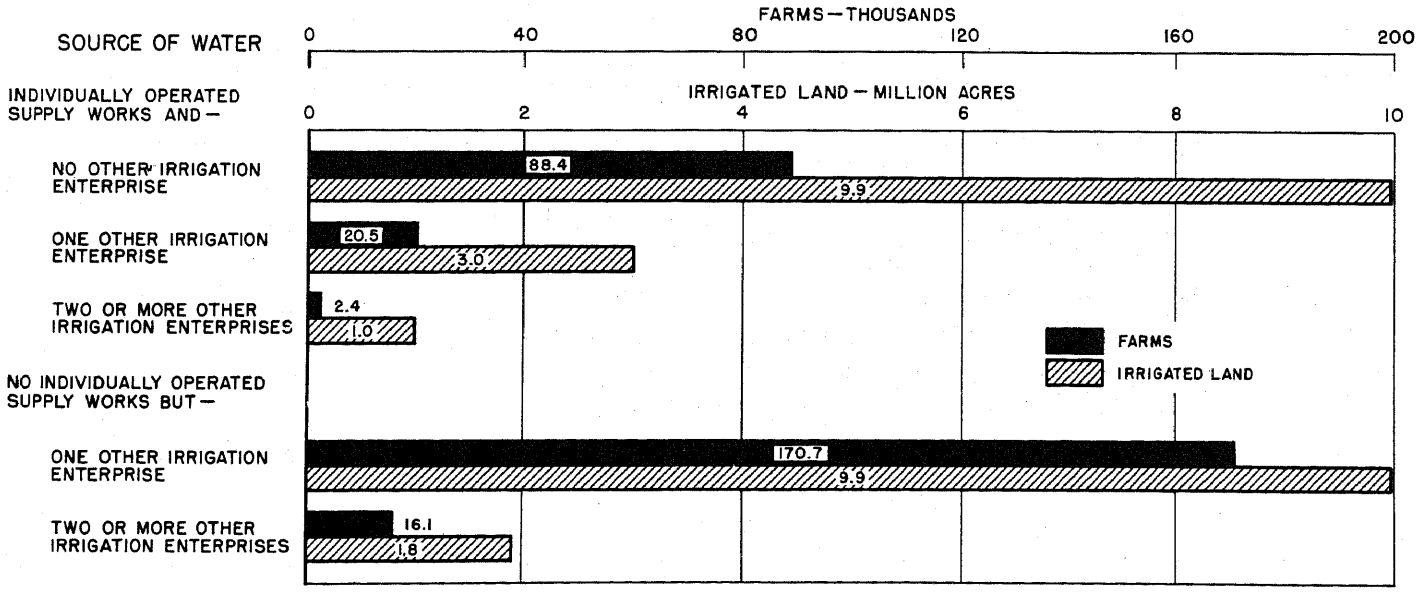
Enterprises that delivered water direct to farms and neither obtained from, nor delivered to other enterprises more than 10 percent of their irrigation water, have been designated "complete-system" enterprises. The data for enterprises classified by type of water and by acreage irrigated are limited to the "complete-system" enterprises.

Another measure of the interrelationship of irrigation enterprises is provided by the classification of the 305,000 farms reporting irrigated land in the 20 States on the basis of the source of water.

Almost three-fifths of the farms obtained their irrigation water from only one enterprise which was operated by an organization other than the farm. The farms supplied with water by a single enterprise reported 9.9 million acres, or 39 percent of all irrigated land.

Water received direct from two or more different irrigation

IRRIGATED FARMS AND LAND BY SOURCE OF IRRIGATION WATER, FOR THE 20 STATES: CENSUS OF 1950



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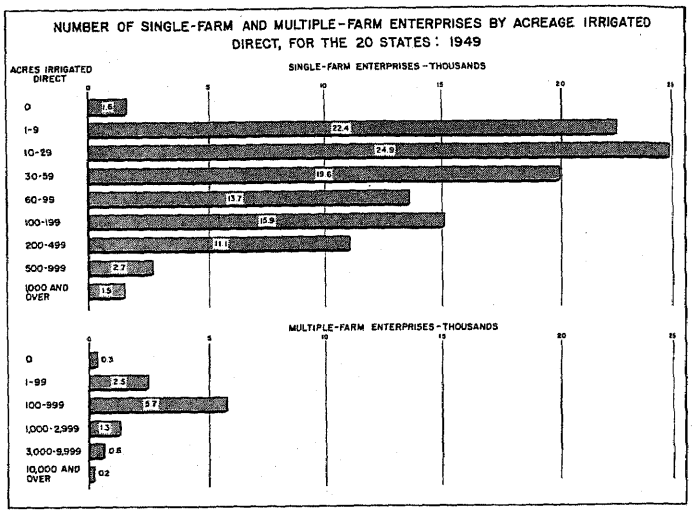
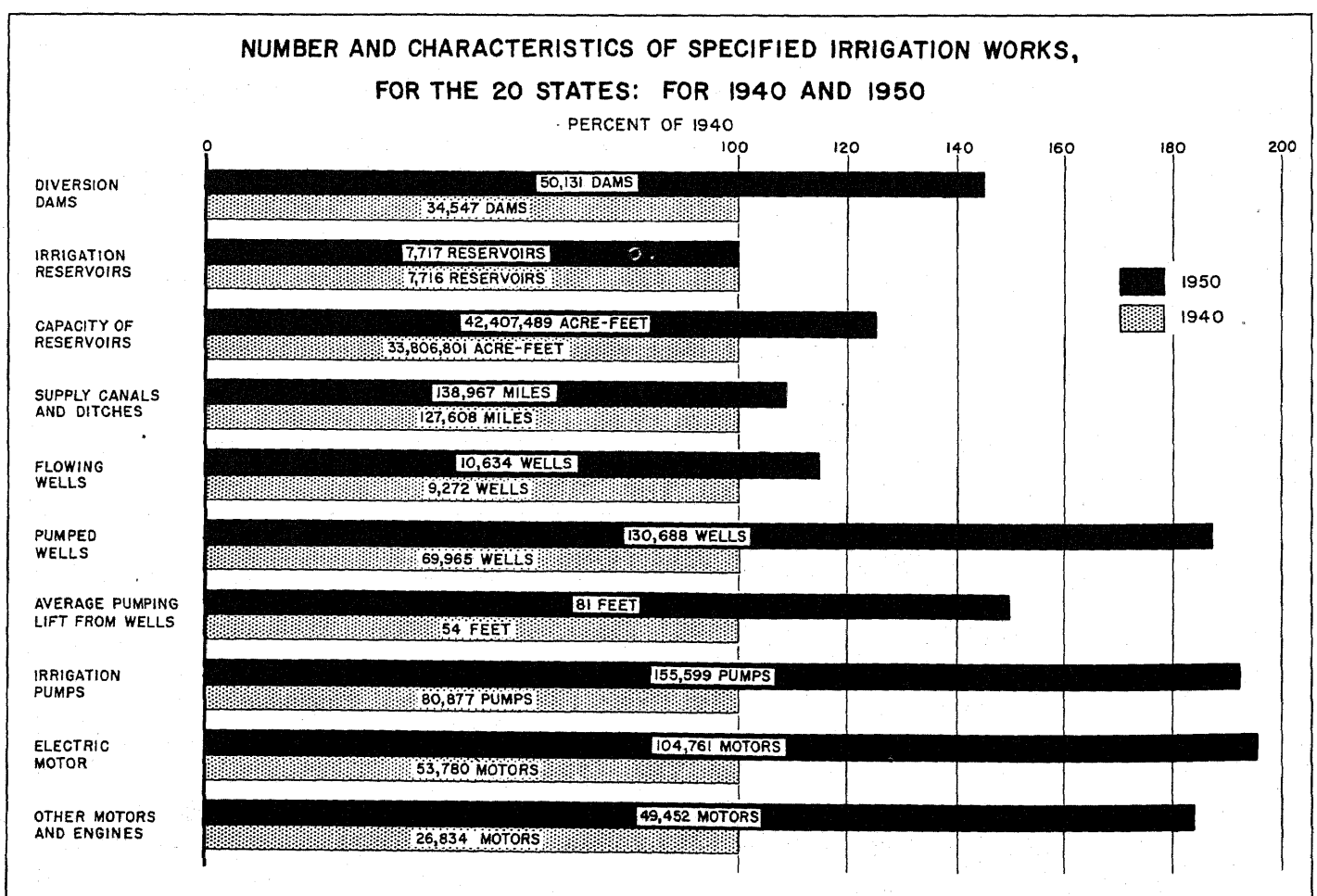
enterprises was used to irrigate the same land on many farms. To avoid duplicate counting of the acreage of such land, the acreage was designated "primary irrigation" for one of the enterprises delivering the water, and "supplemental irrigation" for the other enterprises. Of the 122,023 enterprises that delivered water direct to farms, 89 percent were designated as delivering all water for primary irrigation. These supplied water for 21.5 million acres, or 77 percent of the total acreage irrigated direct. 2,893 enterprises, or 2.4 percent of the total number were designated as delivering part of the water for primary and part for supplemental irrigation. These supplied water for 4.7 million acres of primary irrigation and for 0.7 million acres of supplemental irrigation. Enterprises totaling 10,836, or 8.9 percent of the total, delivered all their water for supplemental irrigation and these supplied water for 3.4 percent of the total acreage irrigated direct.

Size of irrigation enterprise.—For the 20 States, the average acreage irrigated direct in 1949 was 225 acres per enterprise. For most enterprises, acreage irrigated direct is a reasonably good measure of the size of the enterprise. Four out of five multiple-farm enterprises supplied water for the irrigation of less than 1,000 acres. Some relatively large multiple-farm enterprises reported only a small acreage or no acreage irrigated direct because most or all of the water was delivered to other enterprises instead of direct to farms. The average acreage irrigated direct for single-farm enterprises was 114 acres as compared with 1,422 acres for multiple-farm enterprises. Seven out of eight single-farm enterprises provided water for less than 200 acres of irrigated land and only 3 out of 200 provided water for as much as 1,000 acres.

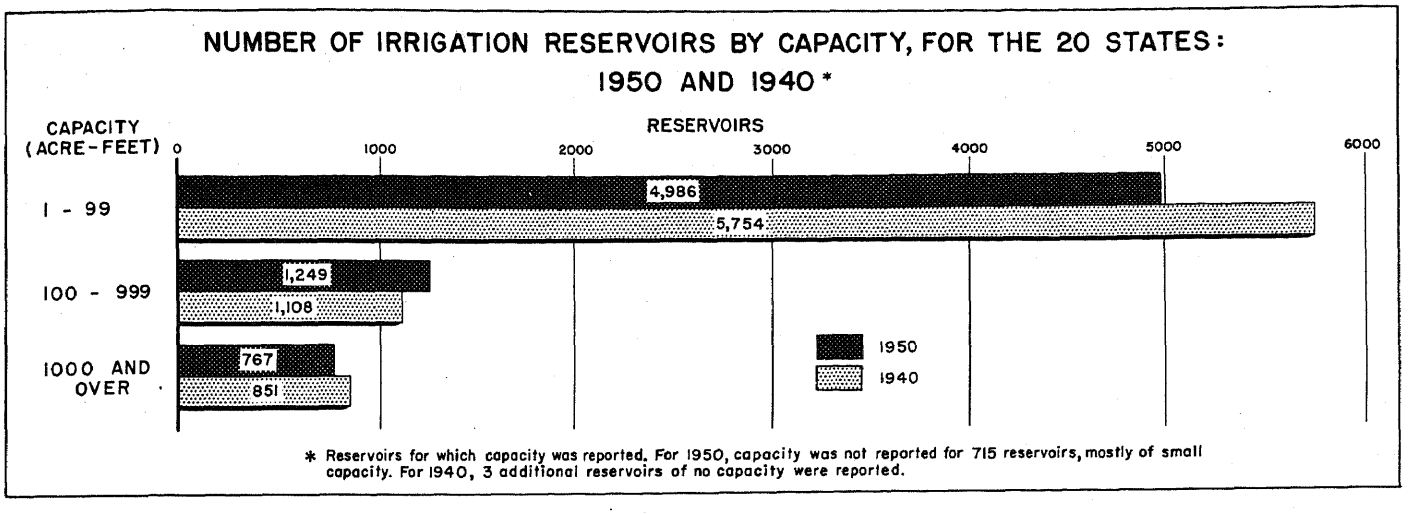


Irrigation works and equipment.—The dams, canals and ditches, reservoirs, pipelines and siphons, tunnels, wells, and motors used to obtain, store, or convey irrigation water comprise the supply works and equipment of irrigation enterprises. Supply works do not include the ditches and pipelines used to distribute and supply water within the farm. Greater changes occurred in irrigation works and equipment during the 1940–1950 period than during any previous decade. Large increases occurred from 1940 to 1950 in the number of diversion dams,



pumped wells, irrigation pumps, electric motors, and other motors and pumps used for irrigation. The large increases in pumped wells, irrigation pumps, electric motors, and other motors and engines reflect the large development in the use of ground water for irrigation during the decade

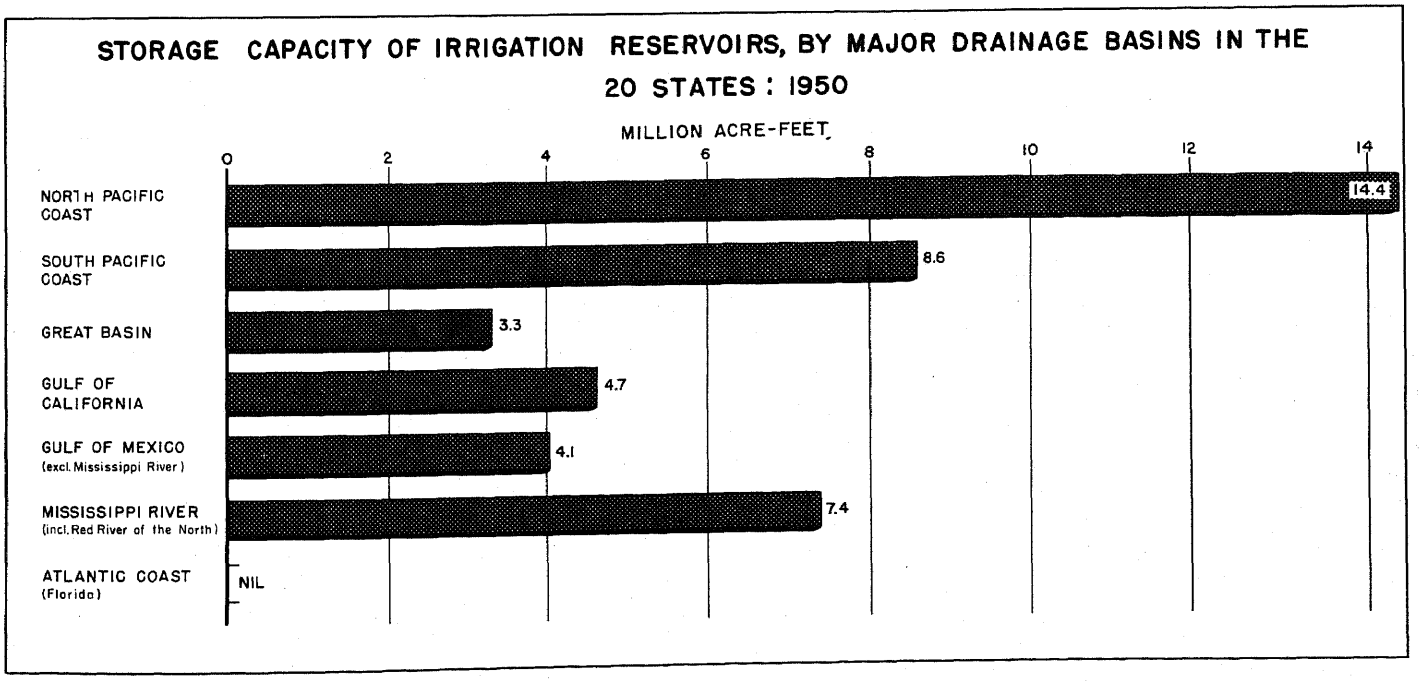
The total reported storage capacity of irrigation reservoirs increased from 33.8 million acre-feet in 1940 to 42.4 million in 1950. The increase in storage capacity from 1940 to 1950 resulted from the construction of a few large reservoirs during the period between 1940 and 1950.

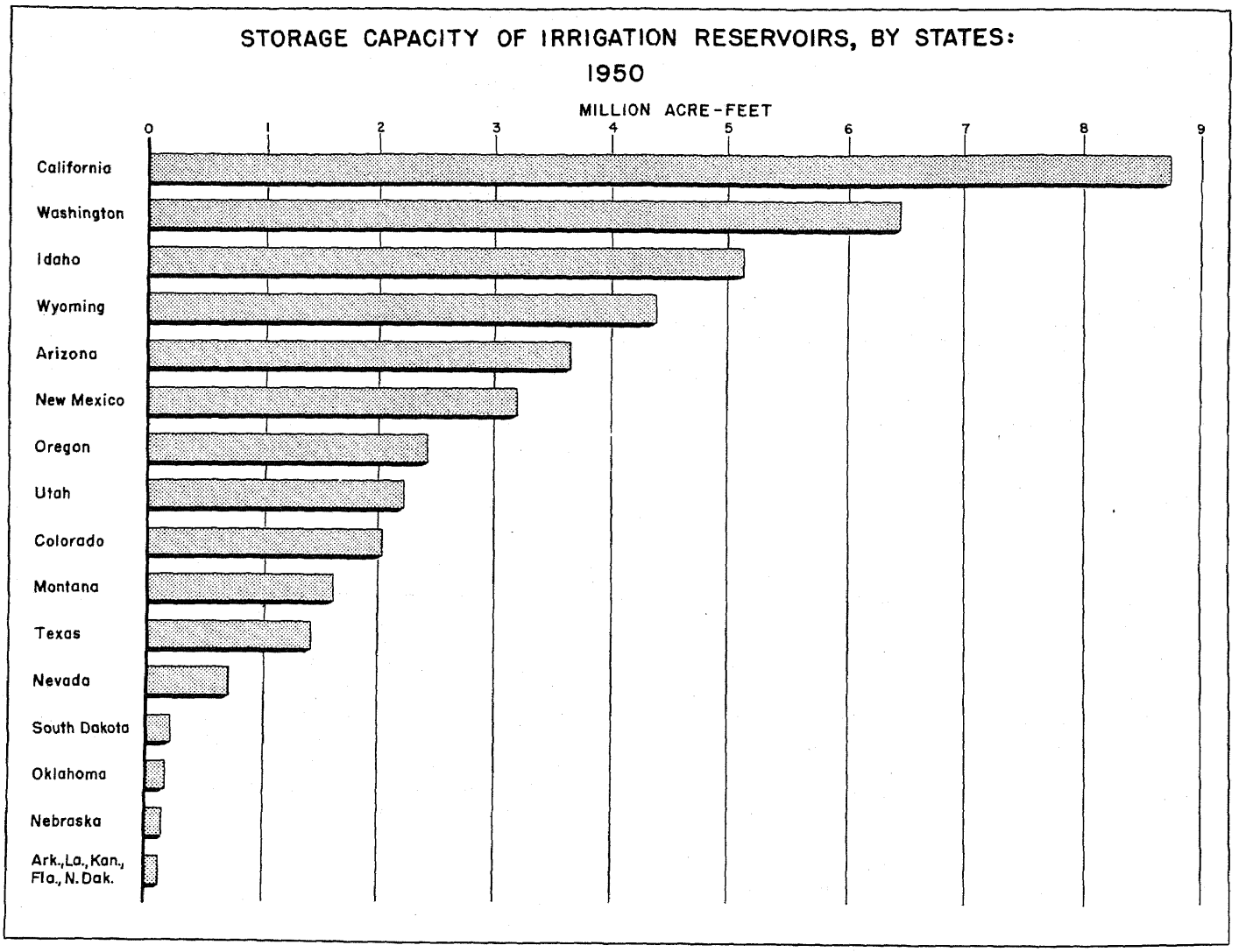


The total number of irrigation reservoirs reported in 1950 was 7,717, or almost exactly the same as the number reported in 1940. However, the storage capacity of irrigation reservoirs increased substantially from 1940 to 1950. Small reservoirs of the "overnight-pond" type, however, were counted in 1940 and not counted in 1950. The reported number of reservoirs with capacity of 1 to 99 acre-feet decreased from 5,754 in 1940 to 4,986 in 1950; the number with capacity of 100 to 999 acre-feet increased from 1,108 to 1,249; and the number with capacity of 1,000 acre-feet and over decreased from 851 to 767.

The storage capacity of reservoirs of 1,000 or more acre-feet comprised over four-fifths of the total reservoir storage capacity.

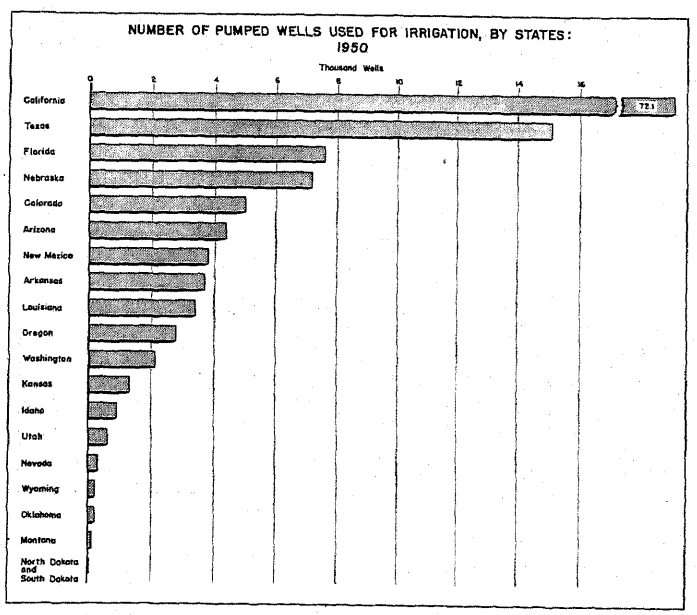
The North Pacific Coast Basin, because of the tremendous capacities reported in California and Washington, has more than 14 million acre-feet total storage capacity. The South Pacific Coast Basin reservoir capacity of more than 8 million acre-feet was also the result of large California reservoirs.

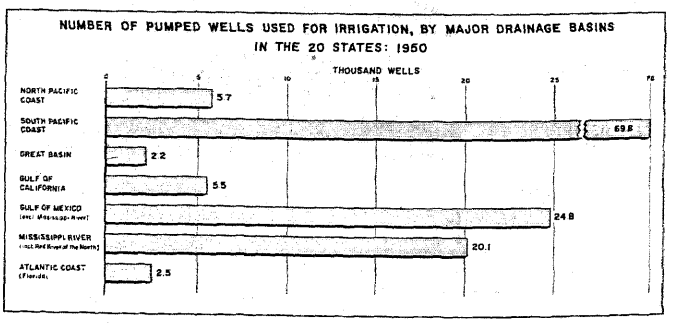




California, with a total reported capacity of irrigation reservoirs amounting to almost 9 million acre-feet, had the greatest capacity of all the 20 States. Washington, Idaho, and Wyoming had reservoirs with capacity ranging from more than six million acre-feet down to about four and one-third million acre-feet.

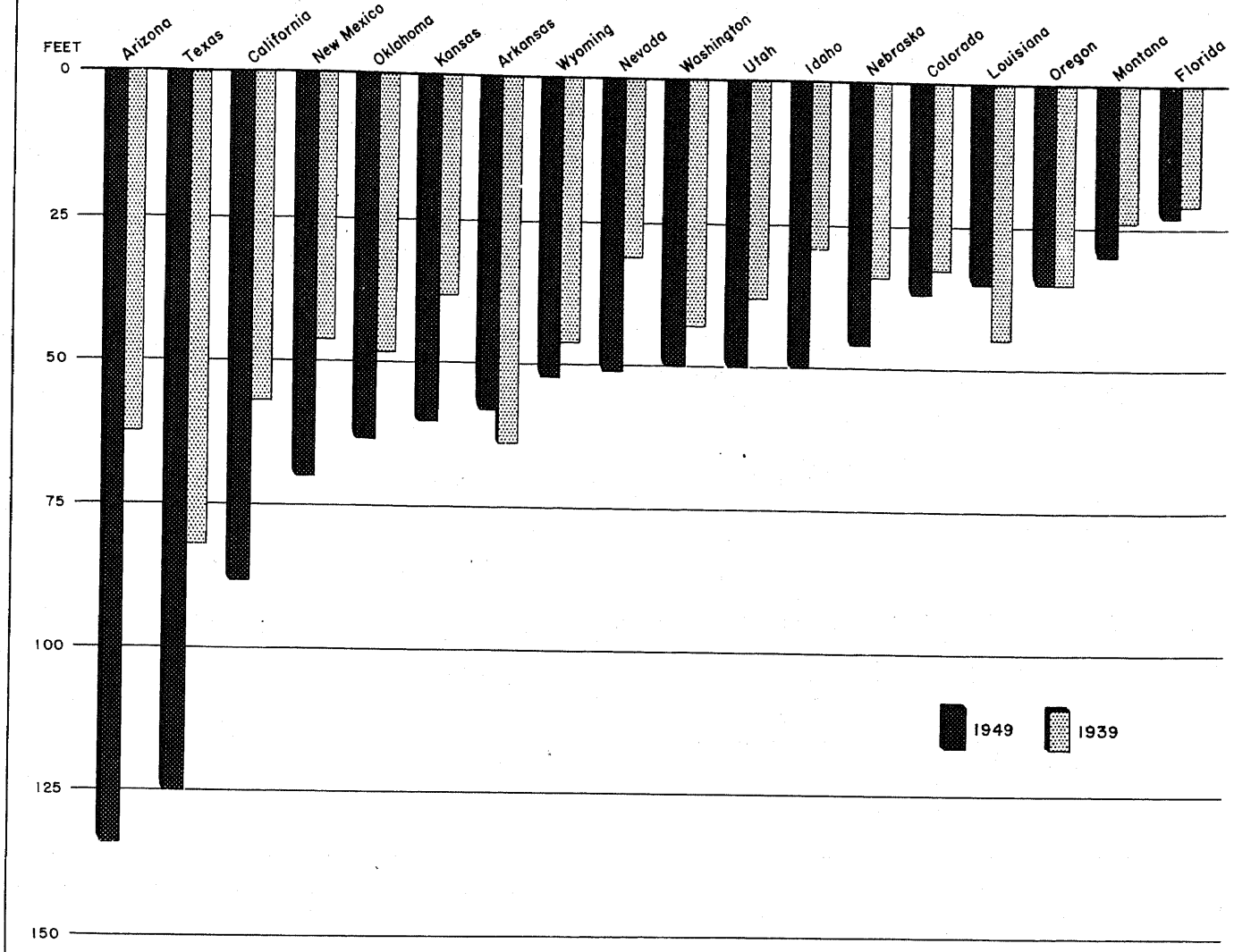
Decreases in storage capacity from 1940 to 1950 of more than a million acre-feet in Arizona and in Utah, and more than 2 million in Nebraska, occurred because large reservoirs that were included in 1940 were used for other purposes more than for irrigation in 1950 and were not classified as irrigation reservoirs. If these reservoirs were excluded from the 1940 figures, the total storage capacity for the 20 States for 1940 would be around 29 million acre-feet and the increase from 1940 to 1950 around 13 million, or 45 percent.



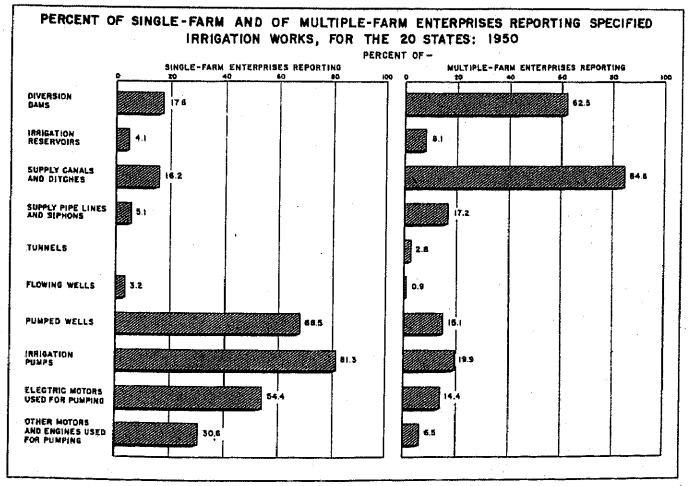


The use of ground water from pumped wells is becoming increasingly important. Large increases in the number of pumped wells occurred in California and Texas during the 10-year period

AVERAGE PUMPING LIFT OF PUMPED IRRIGATION WELLS, BY STATES*: 1949 AND 1939



* North Dakota and South Dakota omitted because number of pumped wells reported was insufficient to provide reliable averages.



from 1940 to 1950. California had over half the pumped wells in the 20 States, and California and Texas had over two-thirds of all pumped wells in 1950.

The South Pacific Coast Basin, because of the great increase in pumped wells in California, had almost 70,000 pumped wells in 1950. This was almost three times the number of pumped wells reported for any other basin. The Gulf of Mexico Basin excluding the Mississippi River had almost 25,000 pumped wells.

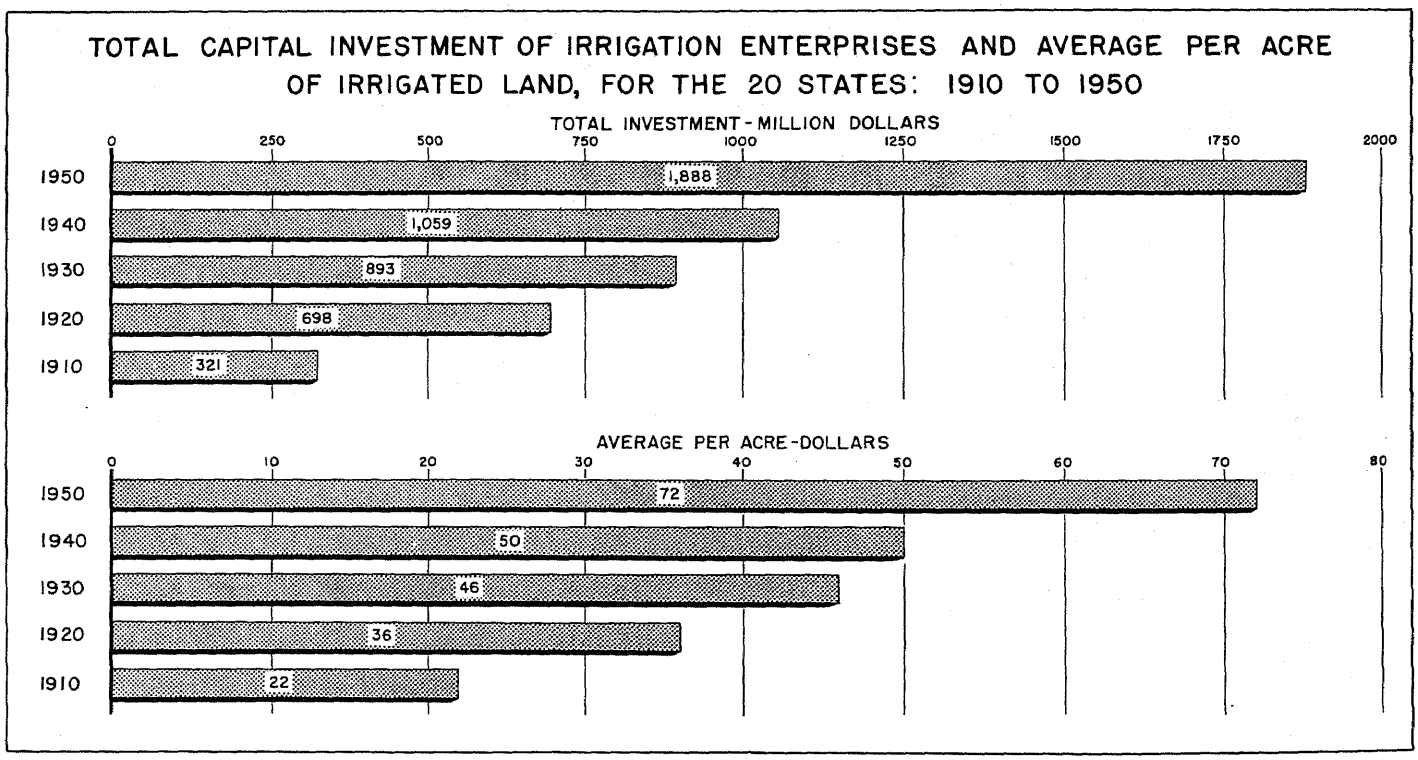
Pumping lift of pumped wells is the vertical distance in feet from the average water level in the well when the pump is operated to the highest point to which water is pumped. The average reported pumping lift of pumped wells for the 20 States was 81 feet for 1949, as compared with 54 for 1939, an increase of 50 percent. The average pumping lift was greater in 1950 than in 1940 for all States except Arkansas, Louisiana, Oregon, North Dakota, and South Dakota.

The deeper average pumping lift reported for 1949 than for 1939 does not indicate a lowering of ground-water levels to the same extent because the increase in depth is due in part to new wells that were drilled between 1939 and 1949 to lower ground-water levels.

The kinds of irrigation works and equipment on single-farm enterprises are significantly different from those on multiple-farm enterprises. Irrigation water on single-farm enterprises is supplied largely by pumped wells and small diversion dams. On the other hand, large diversion dams and supply canals and ditches comprise the important irrigation works for multiple-farm enterprises. More than four out of five single-farm enterprises had irrigation pumps and approximately one out of six had diversion dams and supply canals and ditches in 1950. Five out of eight multiple-farm enterprises had diversion dams and almost seven out of eight had supply canals and ditches in 1950.

million, however, was for the State of Washington, and reflects the large investment of the U. S. Bureau of Reclamation in the Grand Coulee and other projects in that State. Colorado had the third largest total capital investment with $163 million. California, Washington, and Texas led in new capital investment from 1940 to 1950, and these 3 States accounted for 63 percent of the new investment during the 10-year period.

The average capital investment per acre of irrigated land has varied greatly from census to census and among States. For 1950, the average capital investment per acre irrigated ranged from $28 in Nevada to $296 in Oklahoma. The large investment

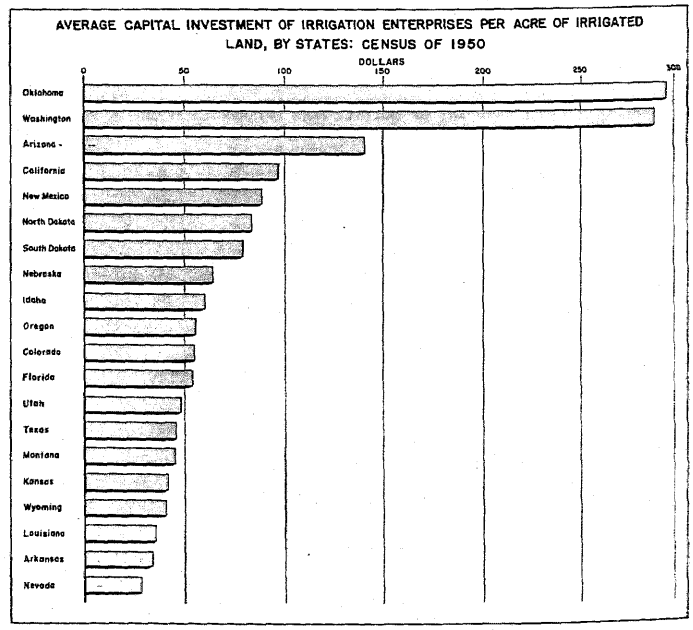


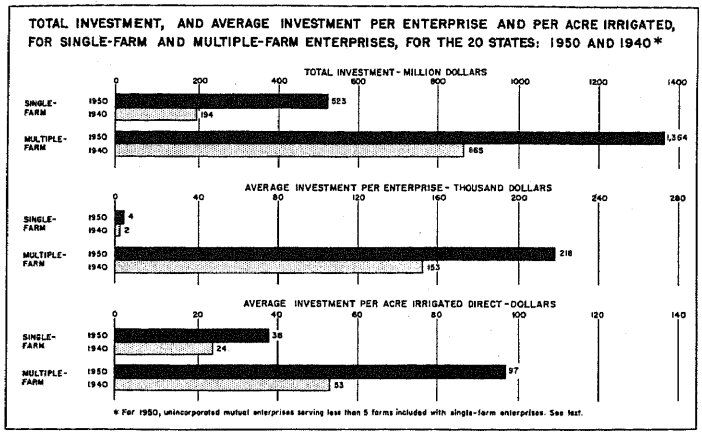
Capital investment.—The data on capital investment of irrigation enterprises are far from precise. The amounts reported for the individual enterprises and many of the smaller mutual enterprises were largely estimates. The greater part of the works of such enterprises was built by the present owners or their predecessors who kept no records of money or labor expended. The works of many of the larger enterprises were built decades ago, and the enterprises have gone through repeated changes in ownership, organization, and capitalization.

The total capital investment in all irrigation enterprises in 1950 was $1,888 million. (Data for capital investment obtained in the 1950 Census related only to the capital that was invested from 1940 to 1950. To obtain data for total capital investment in 1950, it was necessary to add the capital investment as reported in the 1940 Census to the capital investment from 1940 to 1950.) This was almost 6 times the capital investment in 1910 and 78 percent more than the total in 1940. The capital investment as reported for the 1940 Census is not comparable with that of 1950 because of changes in price level, etc. New capital investment from 1940 to 1950 totaled over $800 million. (The new capital investment between 1940 and 1950 represented the amount spent for the original purchase, new constructions, enlargement, or new improvements for irrigation works and for acquiring water rights.) The capital investment per acre irrigated in 1950 was more than 3 times as large as in 1910 and almost 50 percent greater than in 1940.

The largest total capital investment reported in 1950 for any State, $640 million, was for California. The second largest, $178

per acre for Oklahoma reflects the relatively large investment of a large enterprise with recently constructed irrigation works.



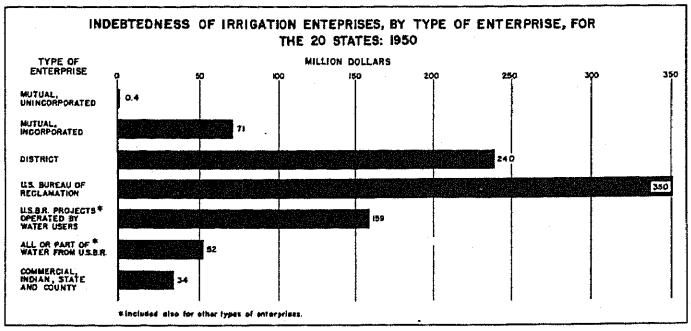


The capital investment in 1950 for multiple-farm enterprises was almost three times as large as that for single-farm enterprises and the average investment per acre was almost three times as large for multiple-farm as for single-farm enterprises. From 1940 to 1950, the new capital investment for single-farm enterprises more than doubled, while that for multiple-farm enterprises increased almost 60 percent. However, as the classification by type for some enterprises was different in 1950 from that for 1940, it is not possible to obtain comparable totals for capital investment by type of enterprise. In 1950, unincorporated mutual enterprises were included with multiple-farm enterprises, while in 1940 these unincorporated mutuals were included with single-farm enterprises.

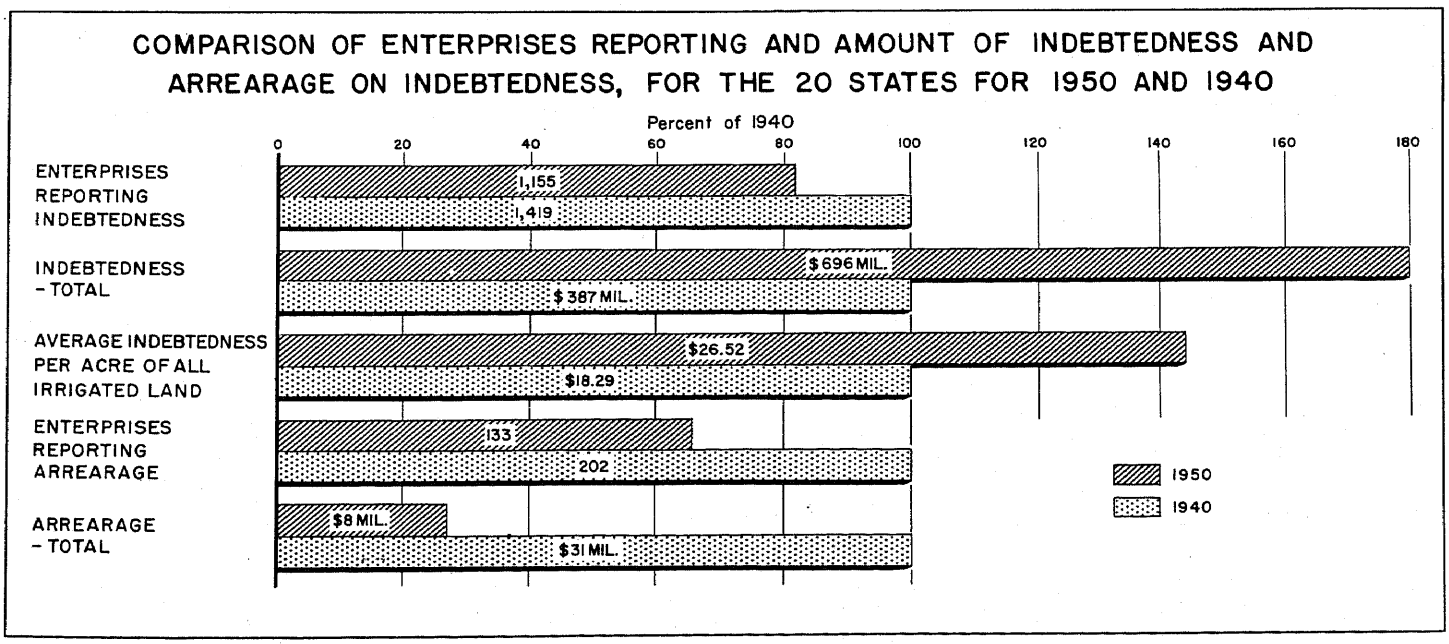
Indebtedness and arrearage.—Statistics on indebtedness relate only to multiple-farm enterprises in 1950 and to enterprises supplying water to more than five farms in 1940.

Only about three-fourths as many multiple-farm enterprises had indebtedness in 1950 as in 1940. However, the total indebtedness in 1950 was 80 percent greater than in 1940. The indebtedness in 1950 was equivalent to more than $26 per acre for all irrigated land in multiple-farm enterprises. This compares with $18 in 1940.

Arrearage in payments on indebtedness was reported in 1950 for only 133, or 1 out of 9, multiple-farm enterprises having indebtedness. The total arrearage amounted to $8 million, or less than 2 percent of the total indebtedness of all multiple-farm enterprises. From 1940 to 1950, the number of enterprises with arrearages declined a third and the amount of arrearage declined 70 percent.



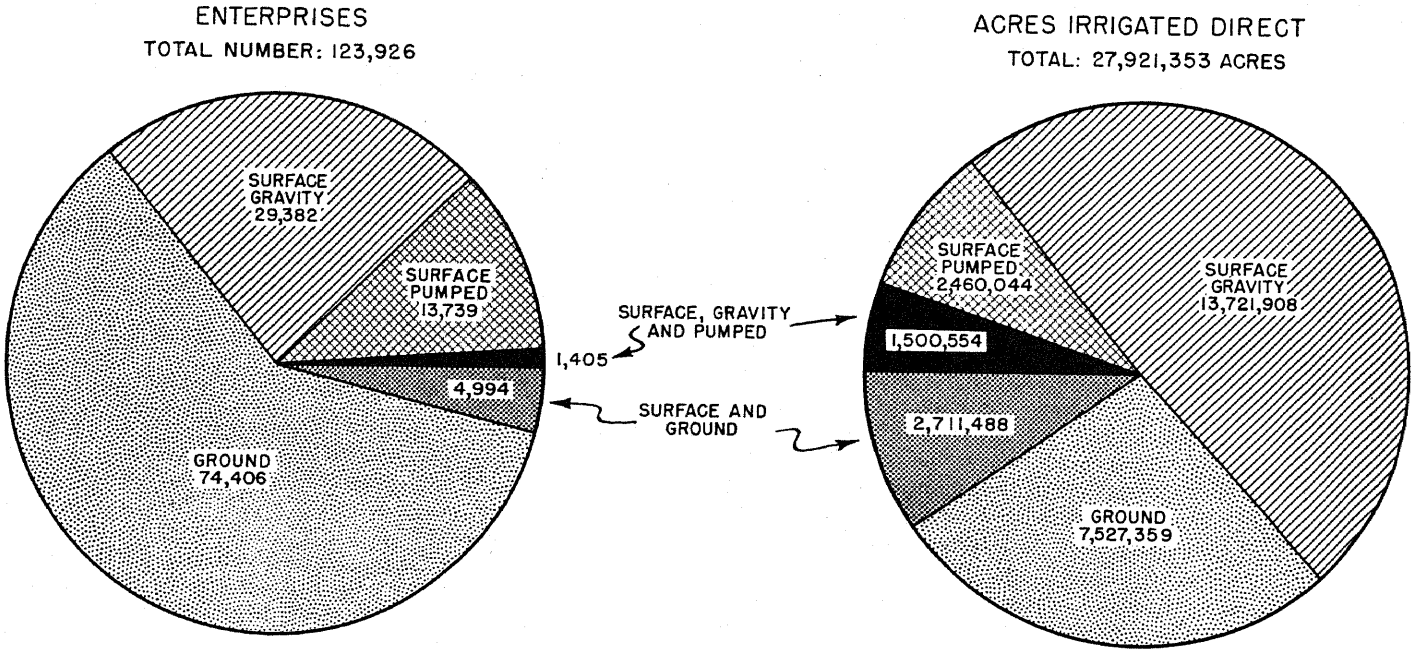
The largest part of the indebtedness was for Bureau of Reclamation projects. Of the total of $696 million, more than half was reported for projects operated by the Bureau of Reclamation in 1949. An additional $159 million was for Bureau of Reclamation projects operated by water users. Most of this represented indebtedness due the United States Government. Enterprises receiving all or part of their water from Bureau of Reclamation projects reported $52 million in indebtedness, but much of this indebtedness may have been for private rather than for government financing. Indebtedness of enterprises not connected with the U. S. Bureau of Reclamation totaled less than $140 million and comprised about one-fifth of the total indebtedness.



A GRAPHIC SUMMARY

IRRIGATION WATER

DISTRIBUTION OF ENTERPRISES AND ACREAGE IRRIGATED FOR ENTERPRISES CLASSIFIED BY TYPE OF WATER, FOR THE 20 STATES: 1949



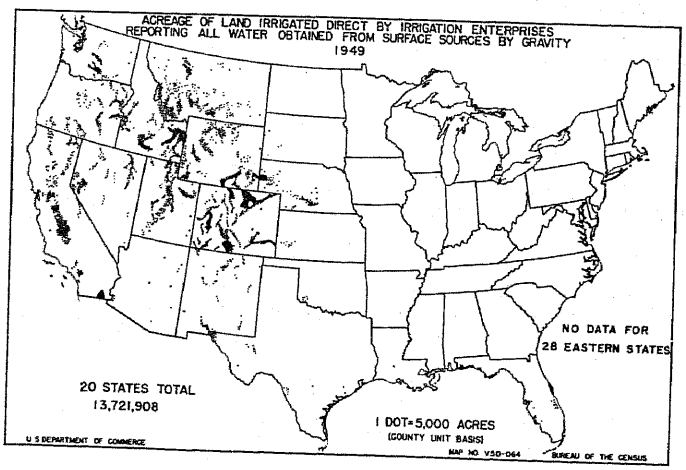
Types and sources of irrigation water.—Irrigation is dependent on two chief sources of water—surface water and ground water. In many areas, particularly the West, present irrigation development requires the continued use of both surface and ground water.

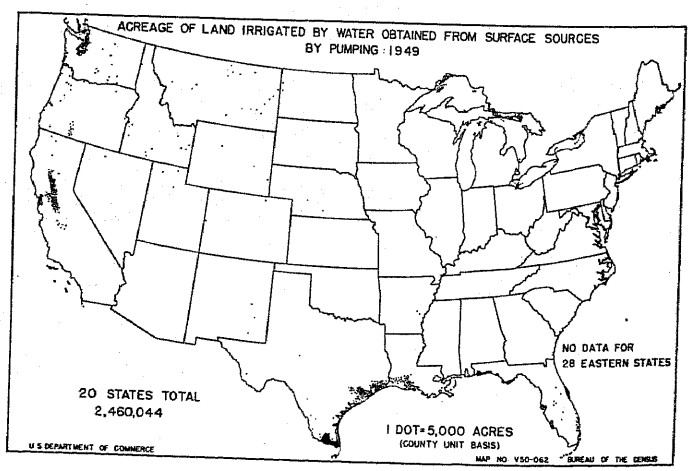
In 1949, about two-thirds of all irrigated land was supplied water from surface sources only. Over one-fourth of the total acreage was irrigated by water from ground sources only. For about 10 percent of the land irrigated, water was obtained from a combination of ground and surface sources.

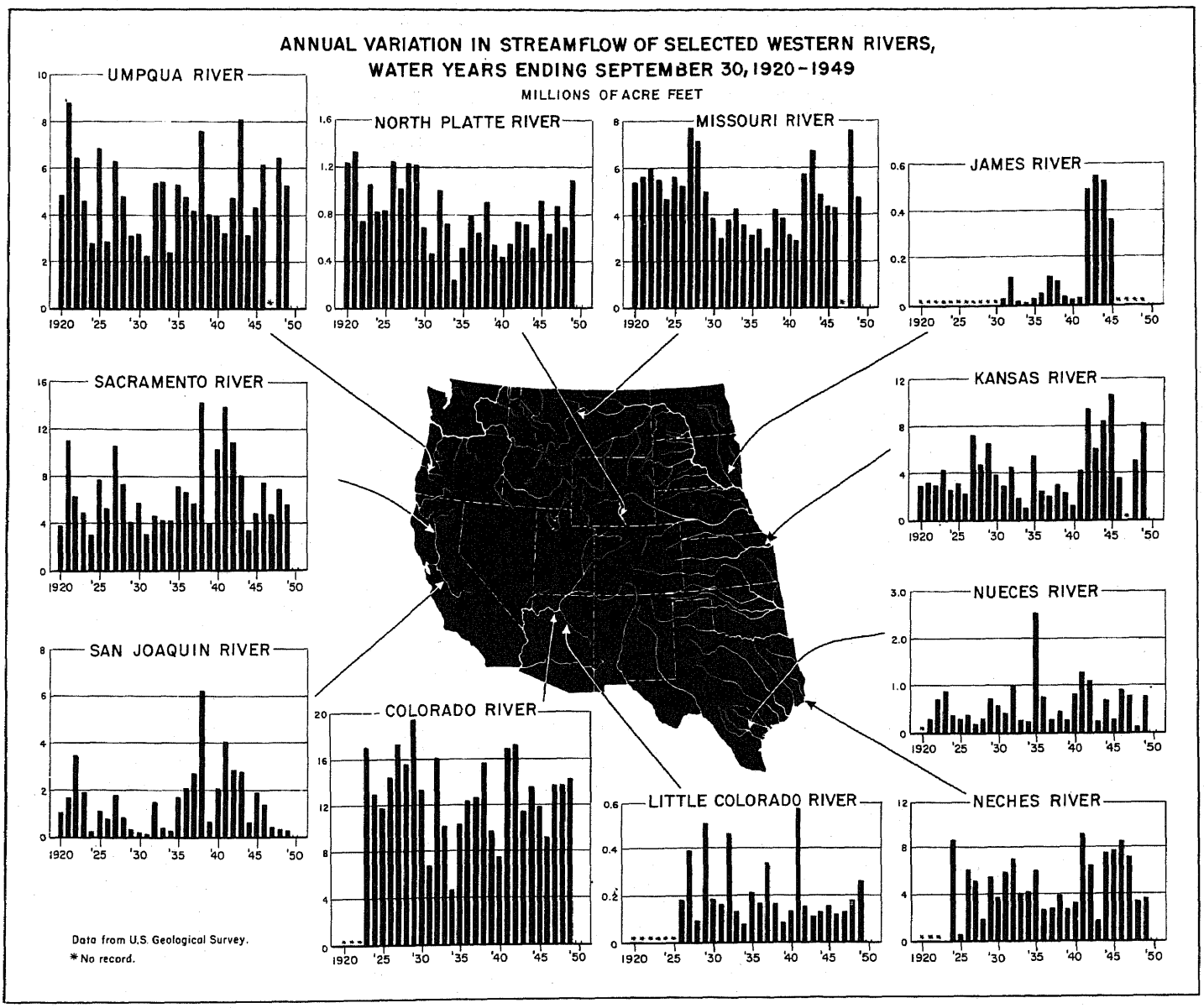
Of the acreage irrigated by surface water, about seven-eighths was obtained from surface sources by gravity, and one-eighth by pumping. Surface sources provided most of the irrigation water in the Mountain States and a large part of the irrigation water in the Pacific States.

Pumped water from streams, reservoirs, etc., provided the only source of water for the irrigation of more than 2.4 million acres, or 9 percent of all acreage irrigated direct in 1949. Pumping from surface sources is important in Texas, Louisiana, and California.

Except where water is stored, the quantity of surface water available for irrigation depends largely on the flow in streams from which water is taken for irrigation purposes. The quantity of water discharged by streams varies from year to year and is continually changing during the season. The variability of the annual flow of some representative streams is indicated by the chart on page 20.



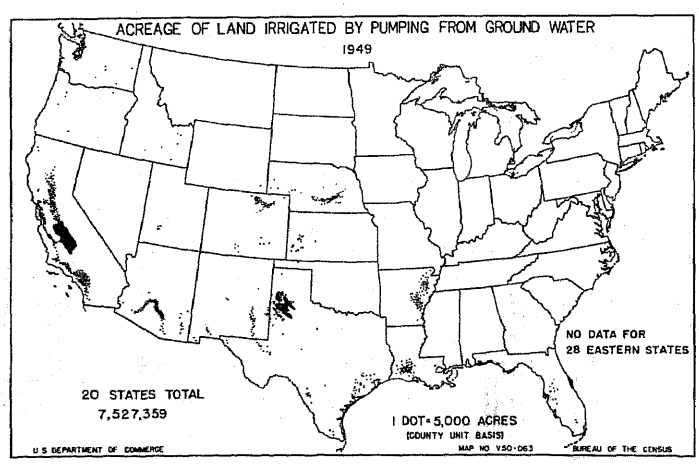




The flow of streams varies during the season. In the West, the great bulk of water comes from the melting of snow at the higher elevations. Streams in the Great Basin are characterized by the high rate of flow during the period of snow-melt (usually May and June). The streams of the Gulf of California Basin have two periods of peak flow—one resulting from snow-melt in March and April, and the other resulting from August and September rainfall. Stream flow is the most important source of irrigation water in the Mississippi River Basin and is affected largely by rainfall. Peak flows occur when rainfall is highest during the spring and summer. Streams of the Gulf Coast depend completely on rainfall. High rates of flow occur during the winter and spring and very low flow is usual during the dry period from August to November.

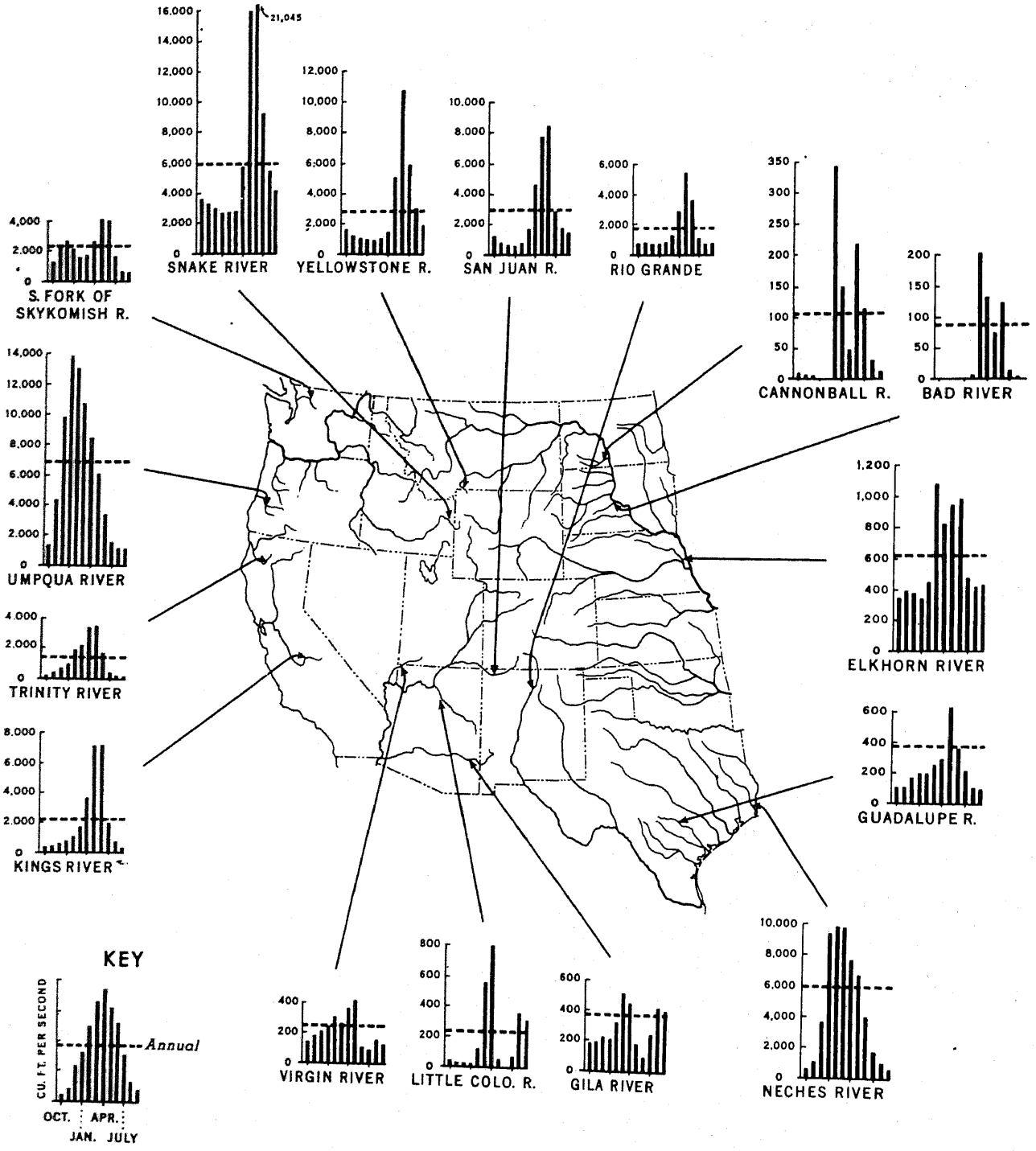
In the areas where the source of irrigation water is from both surface and ground sources, surface water generally is used when available; and ground water is pumped when water is not available from surface sources. Also ground water is used to supplement deficient supplies of available surface water.

The High Plains of Texas and the Central Valley of California are the outstanding areas in which ground water is obtained by pumping. Pumped-well irrigation is important also in the Salt River Valley of Arizona, northern Colorado, Nebraska, western Kansas, and the rice-producing areas of eastern Texas, Louisiana, and Arkansas.



NORMAL SEASONAL FLOW OF WESTERN STREAMS

MEDIAN MONTHLY AND ANNUAL FLOW OF REPRESENTATIVE STREAMS AT POINTS INDICATED, IN TERMS OF CUBIC FEET PER SECOND, PERIODS OF 10 OR MORE WATER YEARS, OCT.–SEPT. INCLUSIVE



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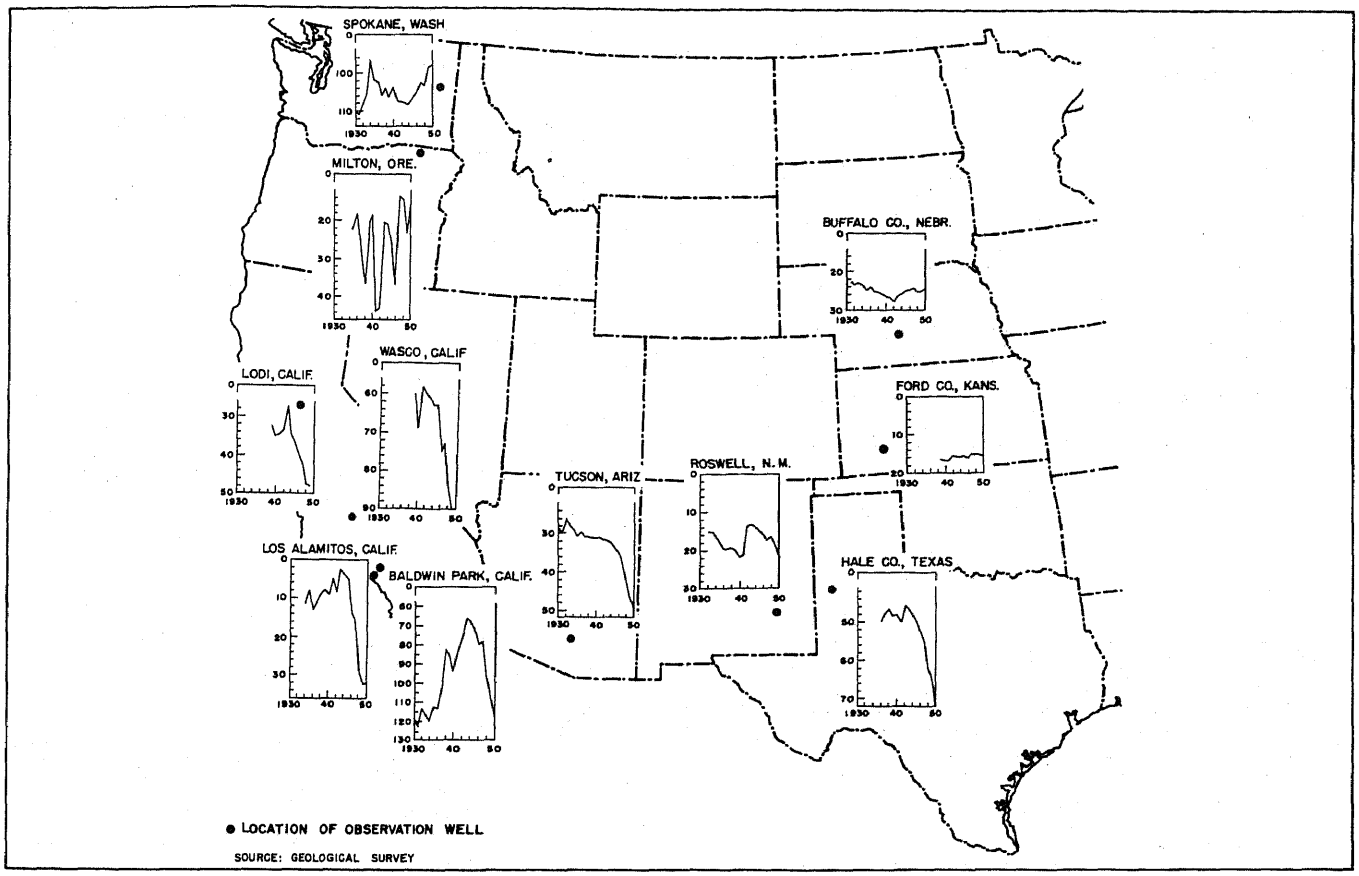
DATA FROM U. S. GEOLOGICAL SURVEY, RELEASE OF THE SURFACE WATER DIVISION, FEB. 1943



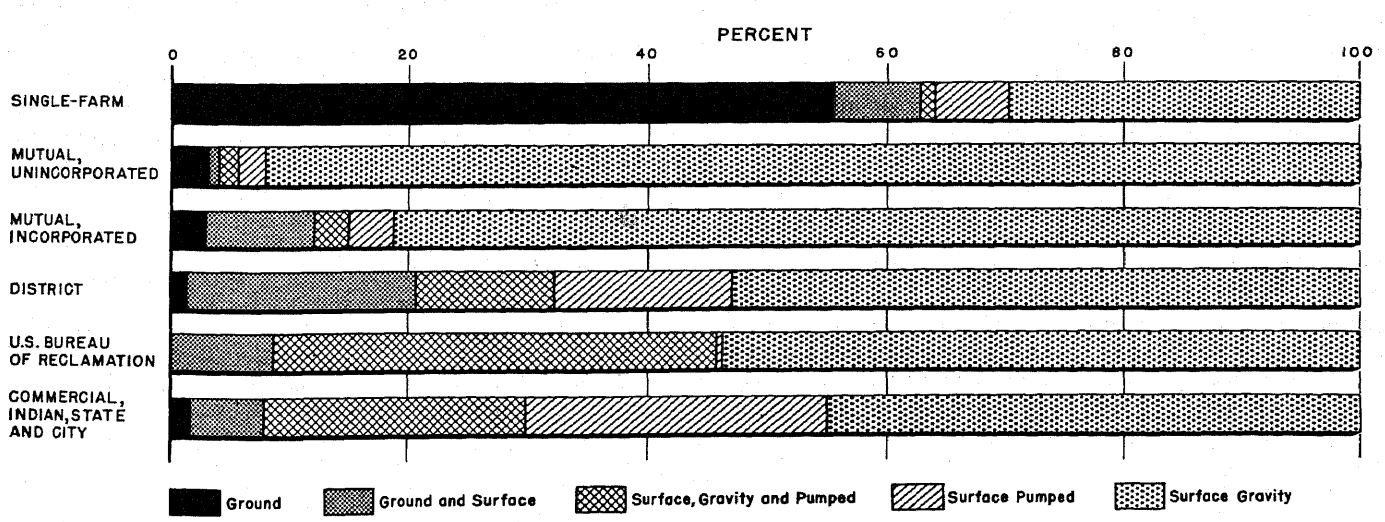
DEPTH TO GROUND WATER, 1930 TO 1950

DEPTH IN FEET TO GROUND WATER ON OR ABOUT MARCH 31 OF EACH YEAR IN SELECTED OBSERVATION WELLS

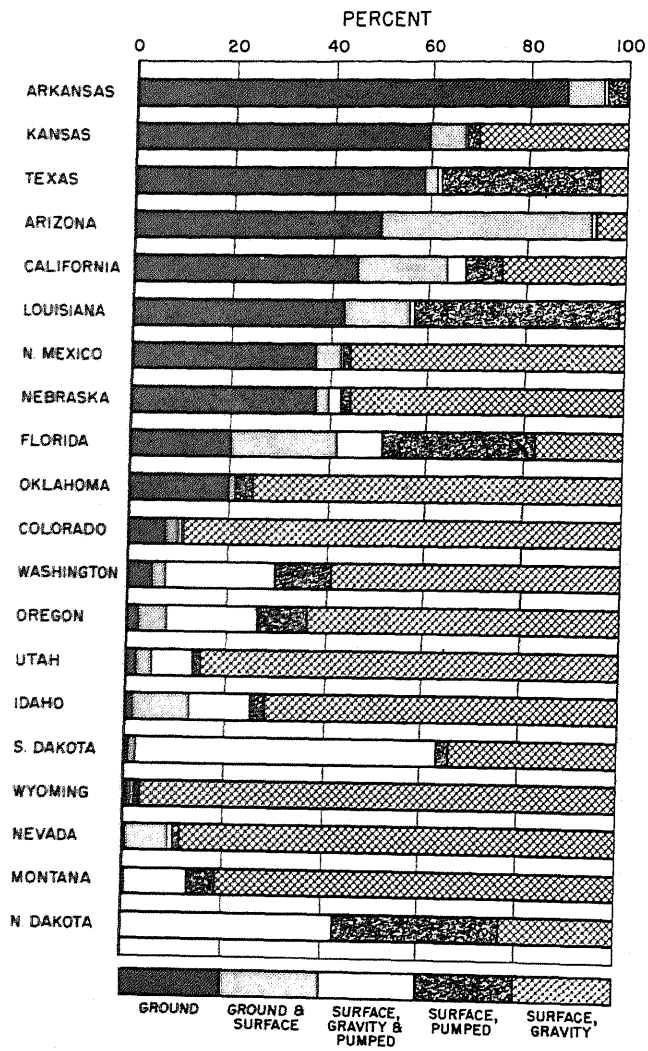
The water level in the more important irrigation pumping areas is steadily declining. Records have been maintained for observation wells (these wells either are not pumped, or they are allowed to recover before a record of the depth of ground water is made) for the purpose of providing information regarding ground-water levels.

The type of water varies significantly by the type of enterprise. Ground water was the most important type of water for single-farm enterprises. Over half of the acreage irrigated direct by single-farm enterprises was for enterprises obtaining ground water from pumped wells. Over 90 percent of the acreage irrigated direct for unincorporated mutuals, and 81 percent for incorporated mutuals, was reported for enterprises having gravity surface water only.

PERCENT DISTRIBUTION OF TOTAL ACRES IRRIGATED DIRECT FOR ENTERPRISES CLASSIFIED BY TYPE OF WATER, BY TYPE OF ENTERPRISE: 1949



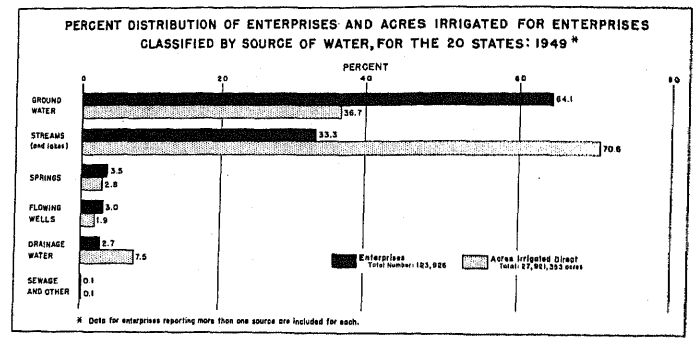
PERCENT DISTRIBUTION OF TOTAL ACREAGE IRRIGATED BY TYPE OF WATER, BY STATES: 1949



Ground water provides irrigation water for a larger acreage than any other source in Arkansas, Kansas, Texas, Arizona, California, and Louisiana. Surface sources provide irrigation water for 90 to 100 percent of the acreage irrigated in Colorado, Washington, Oregon, Utah, Idaho, South Dakota, Wyoming, Nevada, Montana, and North Dakota.

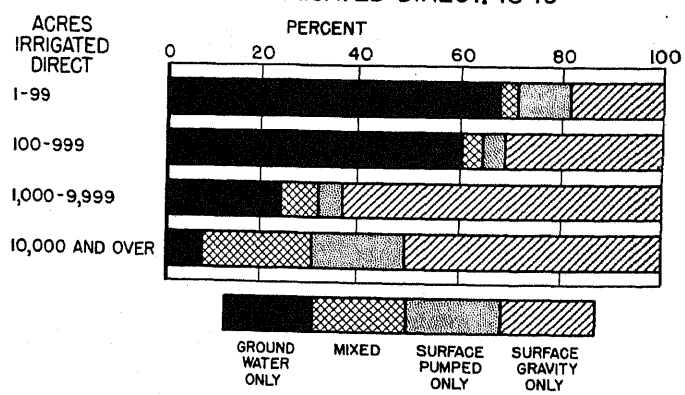
Almost two-thirds of all irrigation enterprises obtained their water supply from ground sources. However, ground sources provided water for approximately a third of the acreage irrigated. While only one-third of the enterprises obtained their water from streams and lakes, the acreage irrigated with water from these sources represents over two-thirds of the total acreage irrigated. Springs, flowing wells, drainage water, and other sources provided water for the irrigation of approximately one-tenth of the total irrigated acreage.

The principal source of surface water was streams. (Lakes were included with streams as a source, because they are supplied chiefly by streams.) Of the 20.4 million acres irrigated direct in 1949 by enterprises that obtained all or part of their water



from surface sources, 97 percent was for enterprises with all or part of their water from streams, 3.8 percent for those with all or part from springs, 2.6 percent for those with all or part from flowing wells, 10.2 percent for those with all or part from drainage water, and 0.1 percent for those with all or part from other sources.

PERCENT DISTRIBUTION OF COMPLETE SYSTEM ENTERPRISES BY TYPE OF WATER, BY ACREAGE IRRIGATED DIRECT: 1949

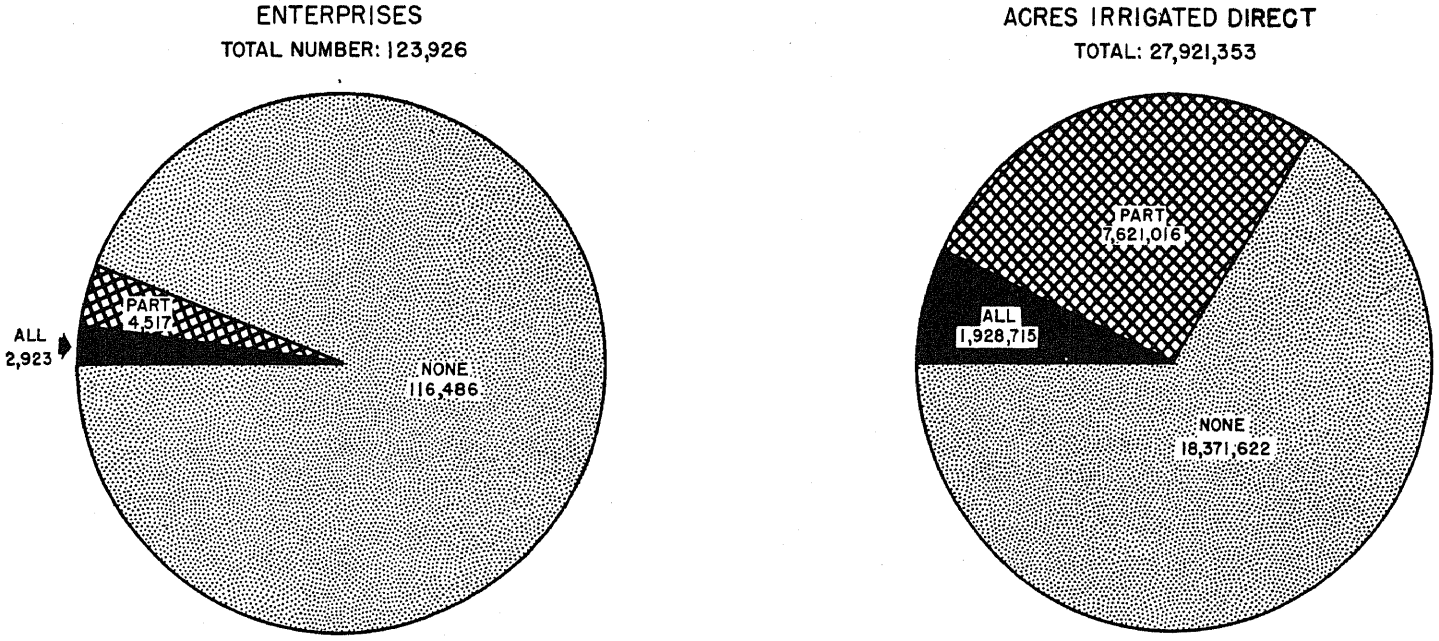


Ground water was used for the irrigation of three-fifths or more of the acreage irrigated direct for small enterprises for which water was supplied for the irrigation of less than 1,000 acres. Surface sources provide water for almost 70 percent of the acreage irrigated direct by enterprises supplying water to 1,000 or more acres.

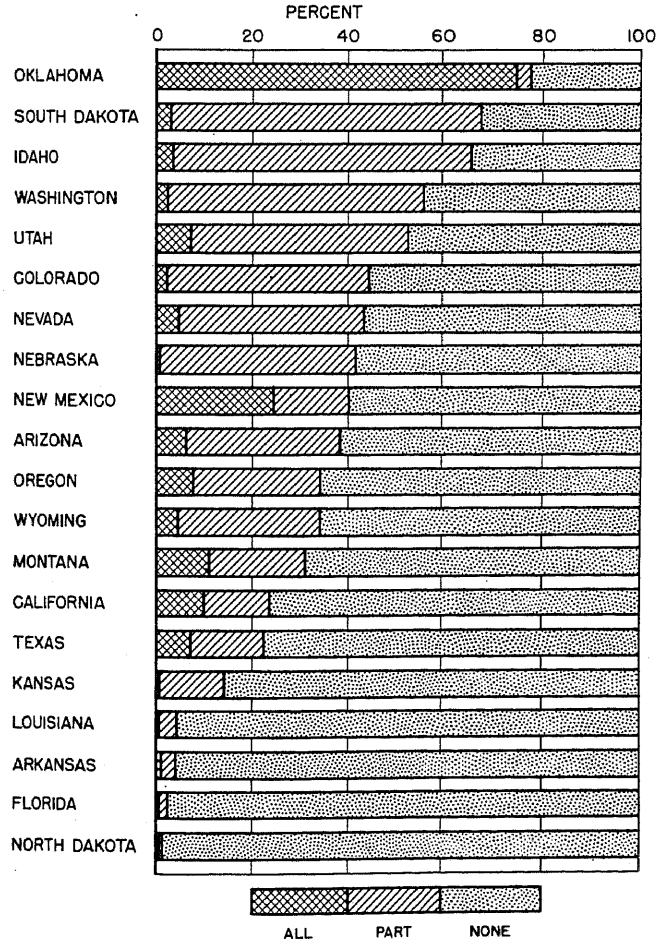
Storage of water.—Because of the inadequate supply of water from streams during the crop-growing season, the storage of irrigation water is necessary in many areas. However, 1 out of 20 irrigation enterprises stored irrigation water in reservoirs. Approximately 2 out of each 100 enterprises stored in reservoirs all the water used and 4 out of 100 stored part of the water used. Irrigation enterprises that stored all the water in reservoirs provided water for the irrigation of approximately one-fifteenth of the total acreage irrigated and enterprises that stored part of the irrigation water supplied water to approximately one-fourth of the total acreage irrigated.

Irrigation enterprises that stored all their water in reservoirs provided for the irrigation of a fifth or more of the total acreage irrigated in only two States, Oklahoma and New Mexico. However, enterprises that stored part of their water in reservoirs supply water for the irrigation of a third or more of the total acreage irrigated in South Dakota, Idaho, Washington, Utah, Colorado, Nevada, and Nebraska. Enterprises that stored none of their

DISTRIBUTION OF ENTERPRISES AND ACREAGE IRRIGATED BY AMOUNT OF WATER STORED IN RESERVOIRS, FOR THE 20 STATES, 1949

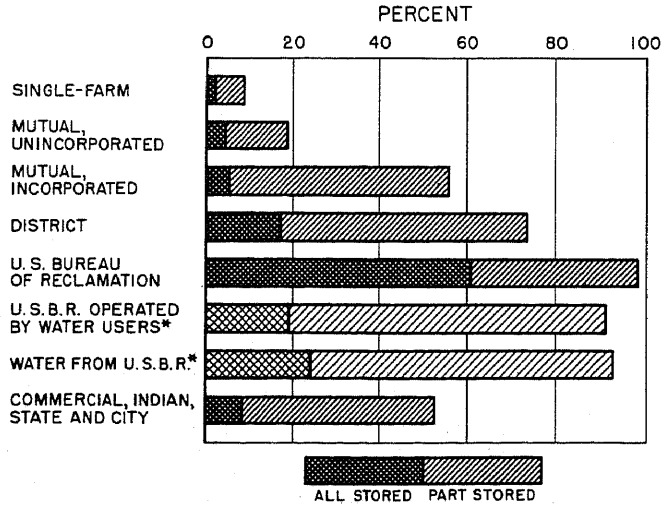


PERCENT DISTRIBUTION OF TOTAL ACRES IRRIGATED DIRECT BY THE AMOUNT OF WATER STORED, IN RESERVOIRS BY STATES; 1949



water in reservoirs supplied water for half or more of the total acreage irrigated in Colorado, Nevada, Nebraska, New Mexico, Arizona, Oregon, Wyoming, Montana, California, and Texas and for over four-fifths of the total irrigated acreage in Kansas, Louisiana, Arkansas, Florida, and North Dakota.

PERCENTAGE OF TOTAL ACREAGE IRRIGATED DIRECT FOR ENTERPRISES CLASSIFIED BY AMOUNT OF WATER STORED IN RESERVOIRS, BY TYPE OF ENTERPRISE: 1949



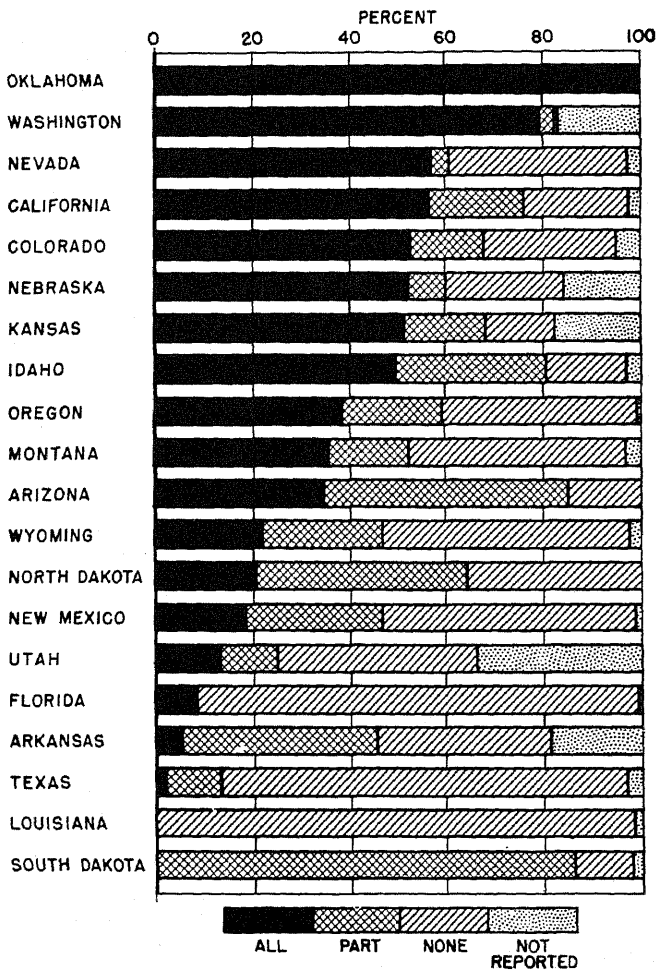
*INCLUDED ALSO FOR OTHER TYPES OF ENTERPRISES.

Water stored in reservoirs was relatively unimportant in terms of the acreage irrigated for single-farm and unincorporated mutual enterprises. A large part of the total acreage irrigated by District and U. S. Bureau of Reclamation enterprises and U. S. Bureau of Reclamation enterprises operated by water users, was supplied water by enterprises that stored all or part of their water in reservoirs.

Measurement of water.—Information on measurement of water is available only for multiple-farm enterprises. Less than a third of the multiple-farm enterprises measured all or part of the water delivered to farms. However, enterprises for which all or part of the water delivered to farms was measured provided water for the irrigation of approximately three-fifths of the total acreage irrigated by all multiple-farm enterprises. Only a small part of the acreage of unincorporated mutual enterprises was irrigated with measured water.

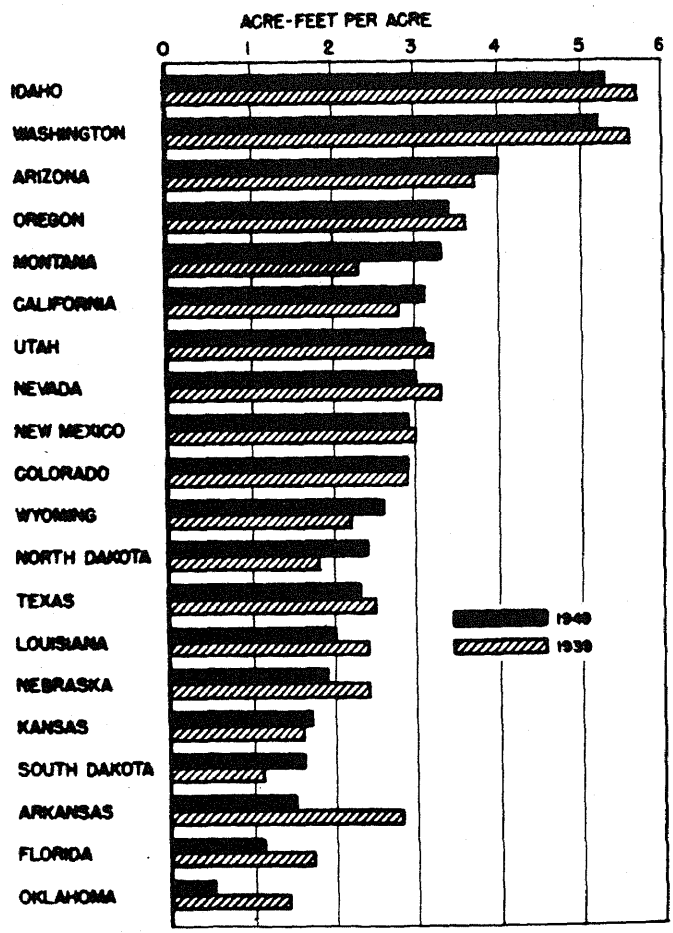
About seven-tenths of the acreage irrigated by District enterprises was supplied with water by enterprises for which all or part of the water delivered to farms was measured.

PERCENT DISTRIBUTION OF TOTAL ACREAGE IRRIGATED DIRECT FOR MULTIPLE-FARM ENTERPRISES BY AMOUNT OF WATER MEASURED TO FARM, BY STATES: 1949



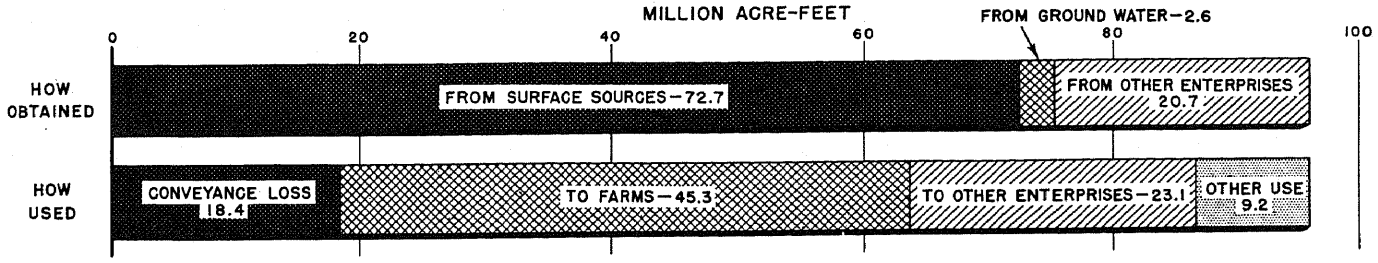
Multiple-farm enterprises for which all or part of the water delivered to farms was measured provided for the irrigation of two-thirds of the total acreage irrigated by all multiple-farm enterprises in Oklahoma, Washington, California, Colorado, Kansas, Idaho, Arizona, and South Dakota and for over two-fifths of the acreage irrigated by such enterprises in Nevada, Nebraska, Oregon, Montana, Wyoming, North Dakota, New Mexico, and Arkansas.

CALCULATED AVERAGE QUANTITY OF WATER DELIVERED TO FARMS PER ACRE OF IRRIGATED LAND, BY STATES: 1949 AND 1939



The amount of water delivered to farms is measured in acres of feet per acre irrigated. (1 acre-foot=the amount of water required to cover 1 acre to the depth of 1 foot, or 43,560 cubic feet.) The calculated number of acre-feet of water delivered to farms per acre irrigated in 1949 varied by States from 0.5 acre-feet in Oklahoma to 5.3 acre-feet in Idaho. The amount of precipitation during the growing season, the kind of crops irrigated and the availability of irrigation water influence greatly the amount of water used per acre irrigated. Except in Arkansas, Florida, and Oklahoma, the amount of water delivered to farms per acre irrigated was about the same in 1949 as in 1939.

REPORTED QUANTITIES OF WATER OBTAINED AND USED IN SPECIFIED WAYS, FOR THE 20 STATES: 1949 *

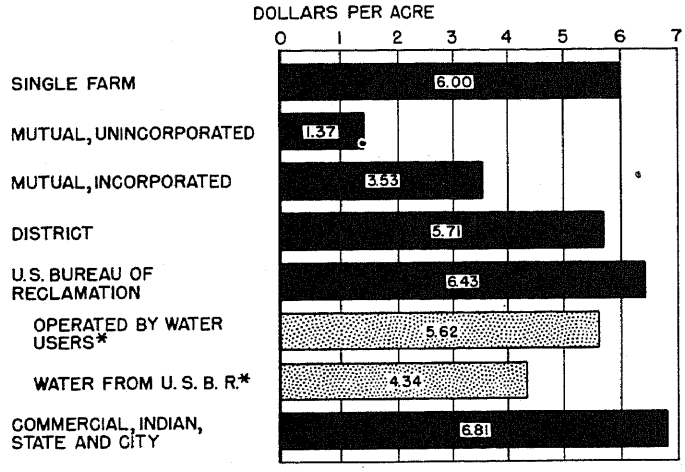


* Quantity of water reported by 9,625 multiple-farm enterprises.

Quantity of water delivered to farms was reported for about 9 out of 10 multiple-farm enterprises. These enterprises obtained over 97 percent of their water from surface sources or from other enterprises. Of the total water obtained by these enterprises, 47 percent was delivered direct to farms, 24 percent was delivered to other irrigation enterprises, 19 percent was lost in conveyance, and 10 percent was used for other purposes.

Cost of water.—The data on cost of water to farms relate to all irrigation enterprises. For single-farm enterprises cost of water includes the total of the following: (1) Cost of fuel and oil used for pumping for irrigation, (2) cost of electricity used for pumping for irrigation, (3) cost of repairs, maintenance, and replacements for irrigation supply works and equipment, and (4) payments made for water obtained from another irrigation enterprise and delivered to land in the farm by means of the irrigation supply works operated by the farm. For enterprises other than single-farm enterprises the cost of water to farms represents payments made by farms to the enterprises in 1949 for irrigation water. The cost of irrigation water to farms was considerably greater in 1949 than in 1939. The average cost per acre of irrigated land was $5.48 in 1949 as compared with $2.57 in 1939. The increase was due in part to the increase in the price level, in part to a larger proportion of the acreage being irrigated in 1949 than in 1939 by pumping, and also in part to the increase in acreage irrigated by the more recently constructed irrigation projects which have higher costs than earlier projects.

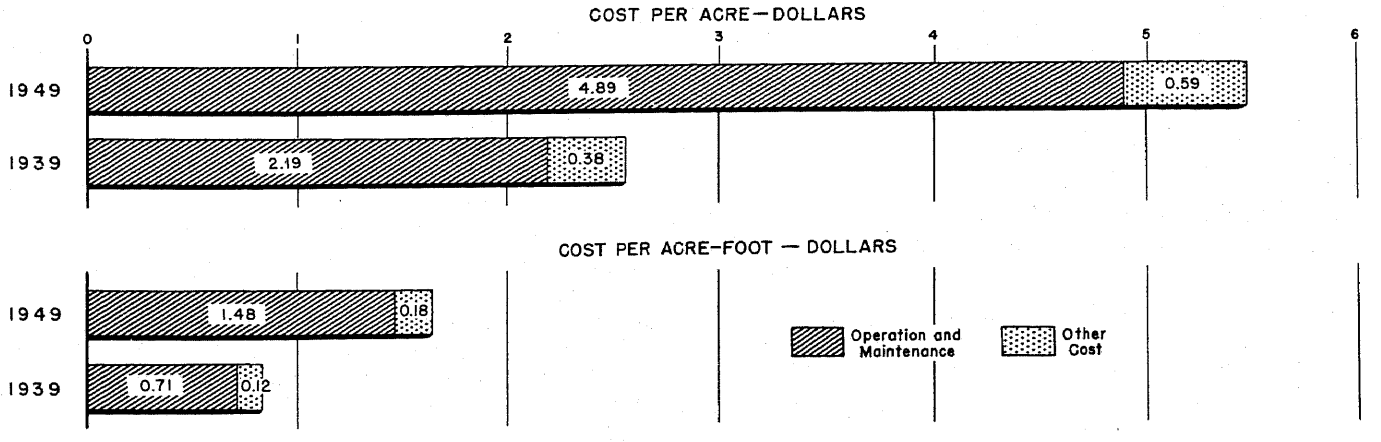
COST OF WATER TO FARMS PER ACRE IRRIGATED, BY TYPE OF ENTERPRISES: 1949



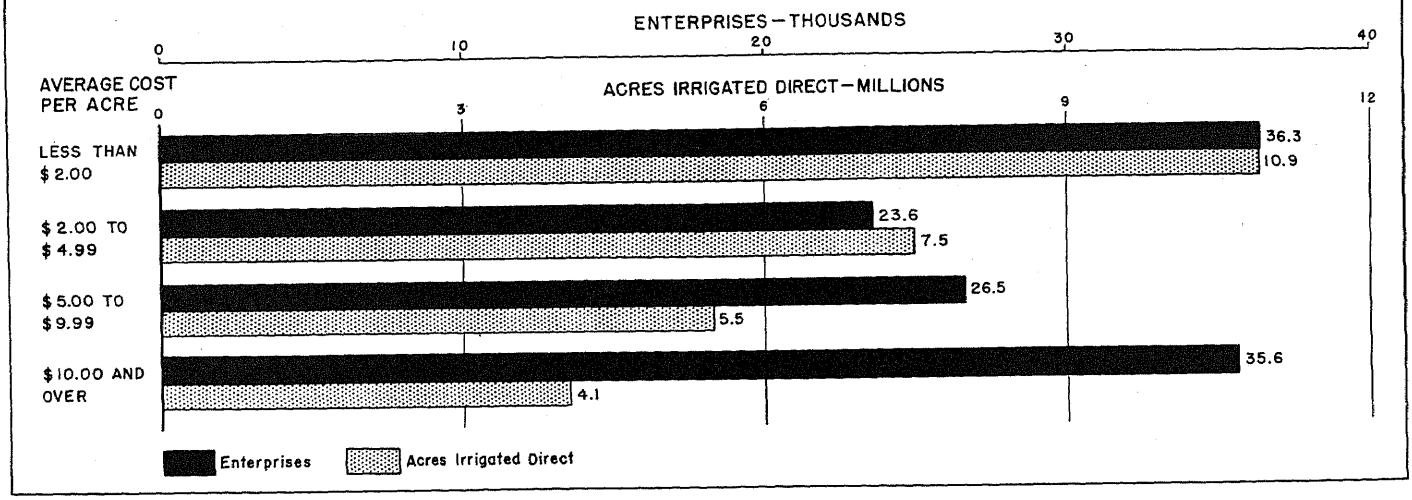
* INCLUDED ALSO FOR OTHER TYPES OF ENTERPRISES.

The cost of water delivered to farms per acre irrigated in 1949 varied by type of enterprise from $1.37 per acre for unincorporated mutual enterprises to $6.81 for enterprises operated by commercial companies, the Bureau of Indian Affairs, and State and city governments.

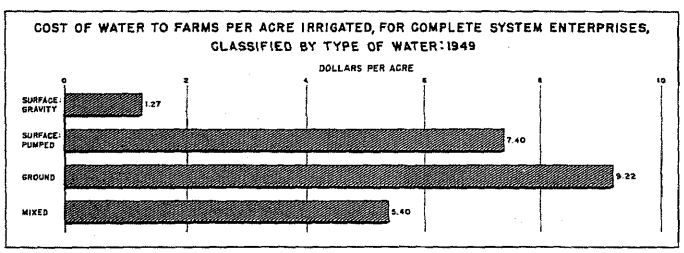
COST OF IRRIGATION WATER TO FARMS PER ACRE OF IRRIGATED LAND AND PER ACRE-FOOT OF WATER, FOR THE 20 STATES: 1949 AND 1939



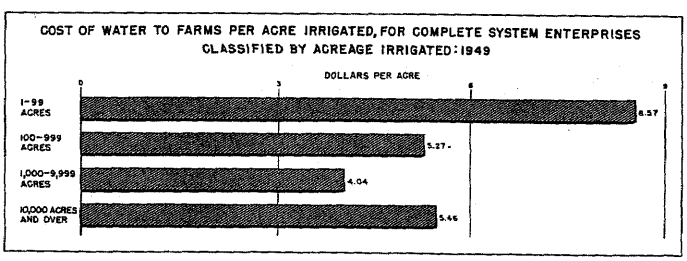
ENTERPRISES AND ACREAGE IRRIGATED DIRECT FOR ENTERPRISES CLASSIFIED BY COST PER ACRE OF WATER TO FARMS, FOR THE 20 STATES: 1949



The average cost of water delivered to farms in 1949 per acre irrigated was less than $2.00 for over one-fourth of the enterprises. These enterprises supplied water to almost 11 million acres, or 39 percent of the total acreage irrigated direct by all enterprises. While the average cost of water delivered to farms per acre irrigated was $10.00 and over for over one-fourth of the enterprises, the acreage irrigated by such enterprises represented one-seventh of the acreage irrigated by all enterprises.

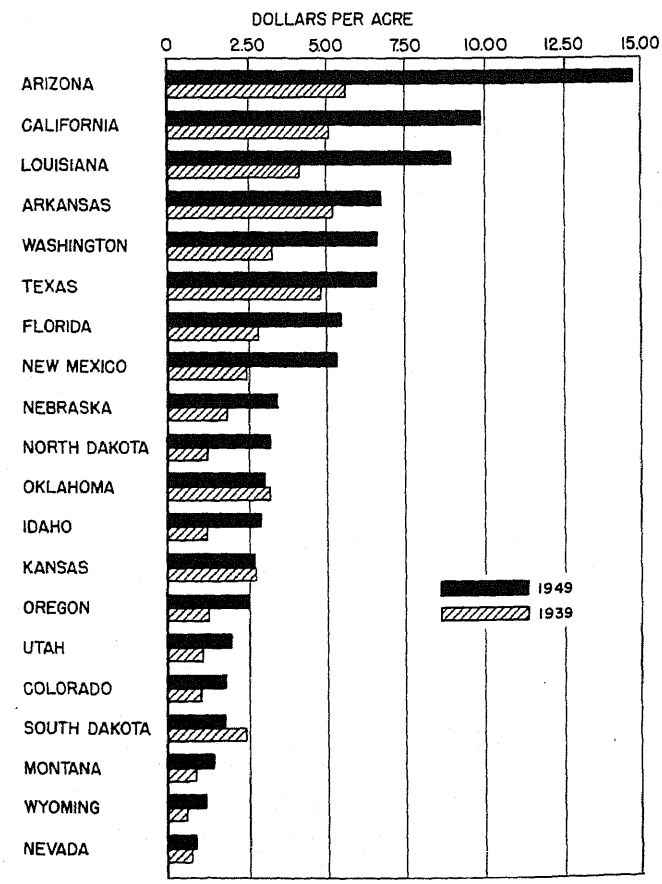


The cost of water per acre irrigated in 1949 was higher for enterprises that obtained all their water from ground sources than that for enterprises obtaining all their water from other sources. The cost per acre irrigated was very much less for enterprises obtaining all their water from surface sources by gravity than that for any other type of enterprise.



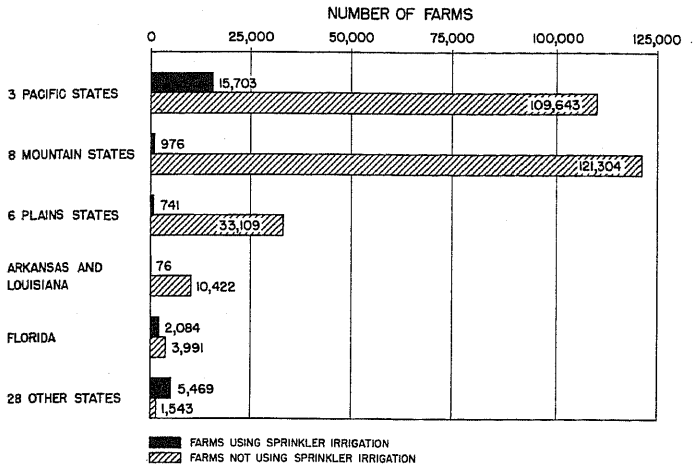
The cost of water delivered to farms per acre irrigated was considerably higher for enterprises providing water for less than 100 acres than that for enterprises providing for the irrigation of larger acreages.

COST OF IRRIGATION WATER TO FARMS PER ACRE OF IRRIGATED LAND, BY STATES: 1949 AND 1939



The cost of water per acre irrigated in 1949 varied by States from $0.87 in Nevada to $14.78 in Arizona. Changes in the quantity of water delivered per acre irrigated, changes in price level, differences in precipitation and availability of irrigation water, and source of water need to be considered in making comparisons between 1949 and 1939.

IRRIGATED FARMS USING SPRINKLER IRRIGATION FOR SPECIFIED AREAS: CENSUS OF 1950

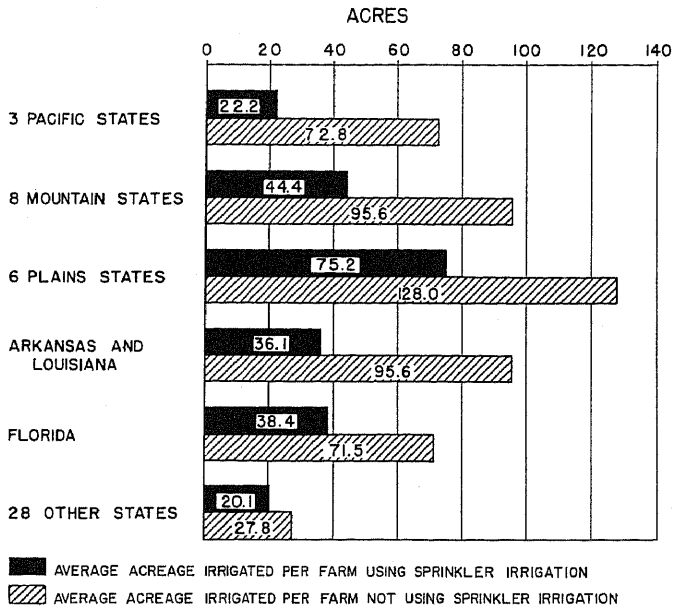


Irrigation by sprinklers.—The use of sprinklers for irrigation is a relatively recent development. Data on the acreage irrigated by means of sprinklers were obtained for the first time in 1950 through the Census of Agriculture.

A total of 25,049 farms reported land irrigated by means of sprinklers in 1949. Approximately 1 irrigated farm out of 12 used sprinklers for irrigating in 1949. Nearly all these farms were in the three Pacific Coast States and in the States east of the Mississippi River. About one-third of the farmers using sprinklers were in California. Sprinklers were used for irrigation on 3 out of 5 irrigated farms in areas outside the 17 Western States, Arkansas, and Louisiana.

In the humid and subhumid regions, sprinkler irrigation is especially adaptable for use in supplemental irrigation. In such areas, where crop production is not wholly dependent upon irrigation, supplemental water can be applied during drought periods by use of sprinklers without extensive land-leveling or canal works.

AVERAGE ACREAGE IRRIGATED PER FARM FOR SPECIFIED AREAS: CENSUS OF 1950

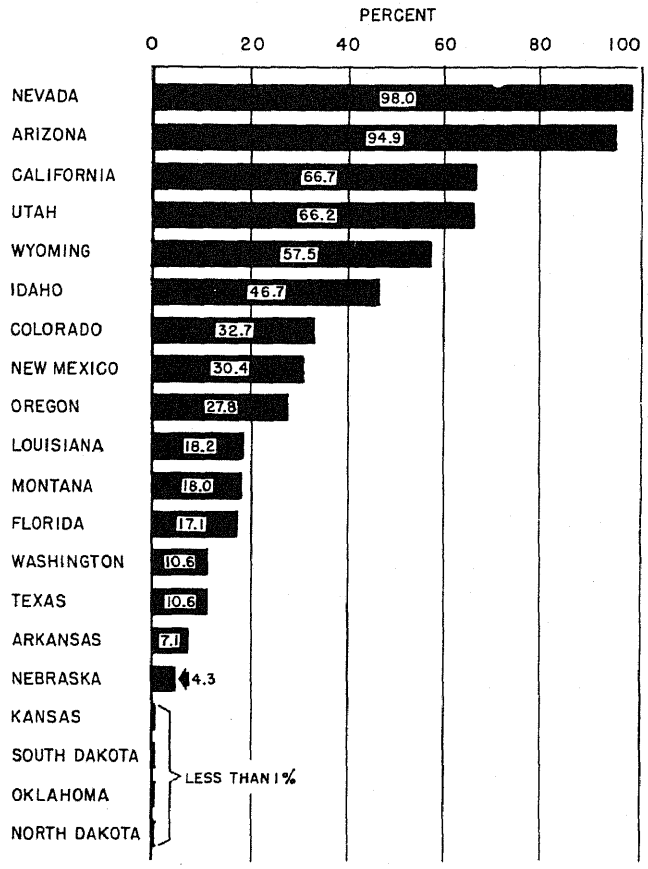


In 1949, 640,000 acres were irrigated by means of sprinklers. More than 84 percent of the acreage irrigated by sprinklers was located in the three Pacific Coast States and the States east of the Mississippi River. In general, the acreage irrigated per farm is much smaller for farms using sprinklers than for farms using other means of irrigation.

The average number of acres irrigated per farm by means of sprinklers was less than a third that of farms not using sprinklers in the three Pacific Coast States. In the Mountain States, the acreage of sprinkler irrigation per farm was less than half the average acreage irrigated on farms not using sprinklers. By States, the average acreage irrigated by sprinklers per farm ranged from about 5 acres in West Virginia to 100 acres in Texas.

CHARACTERISTICS OF IRRIGATED FARMS

PERCENTAGE OF TOTAL CROPLAND HARVESTED THAT WAS IRRIGATED, BY STATES: 1949.



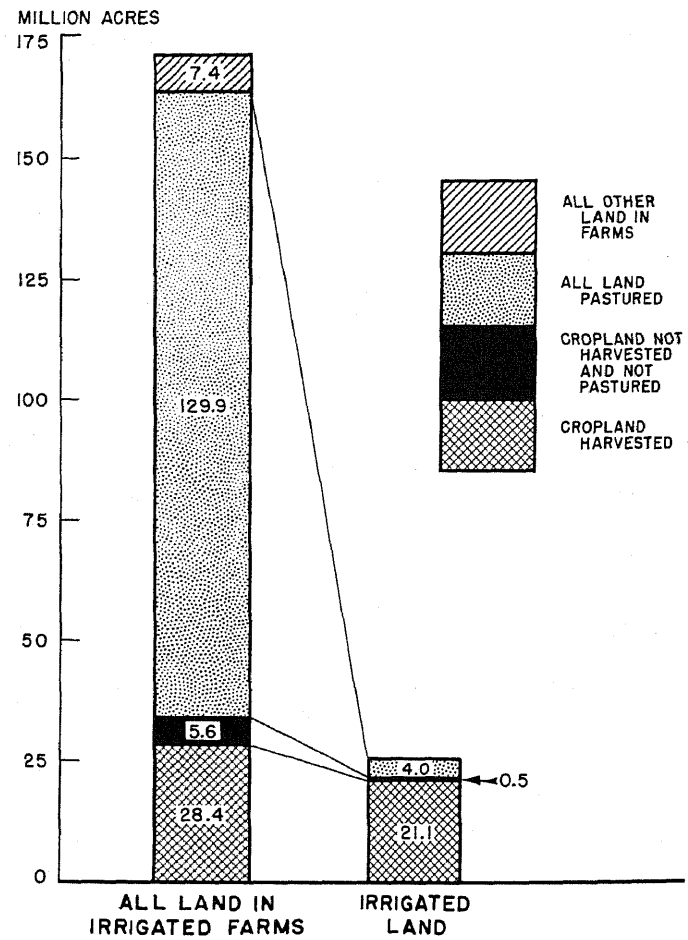
There were 298,049 irrigated farms containing 171,335,185 acres of land in the 17 Western States, Arkansas, Louisiana, and Florida in 1950. Irrigated farms represented 17.9 percent of all farms in the 20 States and contained 23.3 percent of all land in farms in the area.

The importance of irrigation for crop production varies by States. About 1 out of 8 acres of cropland harvested in the 20 States was irrigated in 1949. In the 11 Western States, 2 out of 5 acres of cropland harvested were irrigated. Nearly all of the cropland harvested in Nevada and Arizona, and two-thirds of the cropland harvested in California and Utah was irrigated. Except for Louisiana and Florida, less than a tenth of the acreage of cropland harvested in the States east of the 100th meridian was irrigated. However, because the yield per acre on irrigated cropland is much greater than on nonirrigated cropland, the proportion of cropland irrigated greatly understates the importance of the irrigated portion.

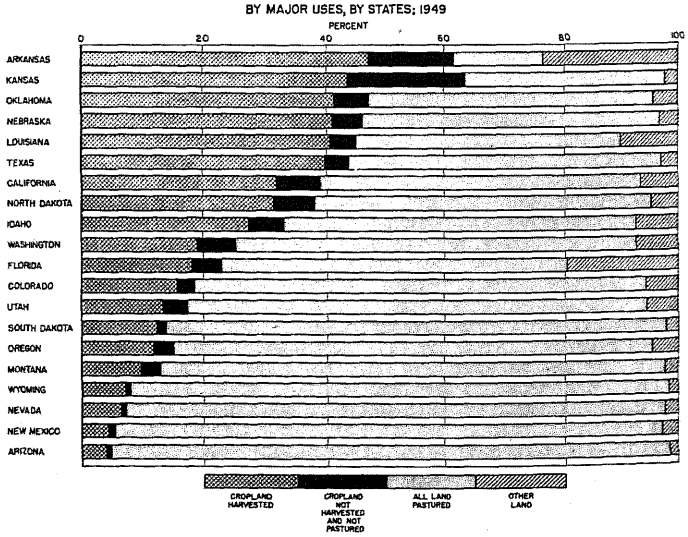
Use of land in irrigated farms in 1949.—Most of the land in irrigated farms in the 20 States was pasture and grazing land. About 3 out of 4 acres of land in irrigated farms was used for pasture or grazing, and only 1 out of 6 acres was used for harvested crops. Irrigated cropland harvested comprised 21 million out of 28 million acres of cropland harvested for all irrigated farms.

Pasture or grazing land comprised more than half of all the land in irrigated farms in all of the 20 States except Arkansas, Kansas, Oklahoma, and Louisiana. In Colorado, Utah, South Dakota, Oregon, Montana, Wyoming, Nevada, New Mexico, and Arizona, less than one-fifth of the acreage in irrigated farms was cropland.

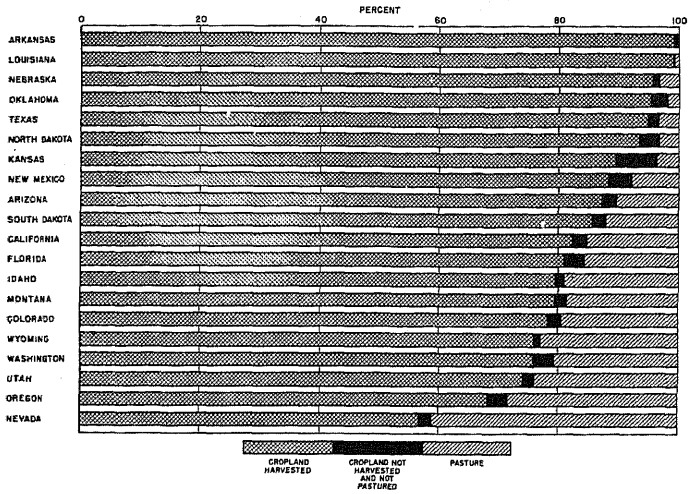
ALL LAND IN IRRIGATED FARMS, AND IRRIGATED LAND, BY MAJOR USES, FOR THE 20 STATES: 1949



PERCENTAGE OF ALL LAND IN IRRIGATED FARMS BY MAJOR USES, BY STATES: 1949

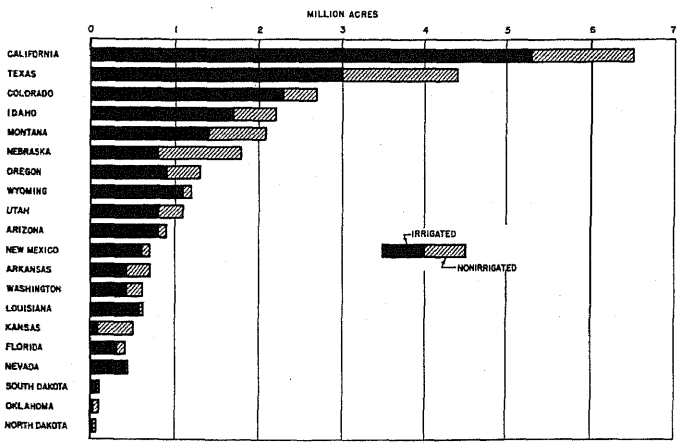


PERCENTAGE OF IRRIGATED LAND BY MAJOR USES, BY STATES: 1949



More than four-fifths of all irrigated land in the 20 States was used for harvested crops. About one-sixth of the irrigated acreage was used for pasture or grazing. Cropland harvested comprised 9 out of 10 acres of all irrigated land in 6 out of the 20 States.

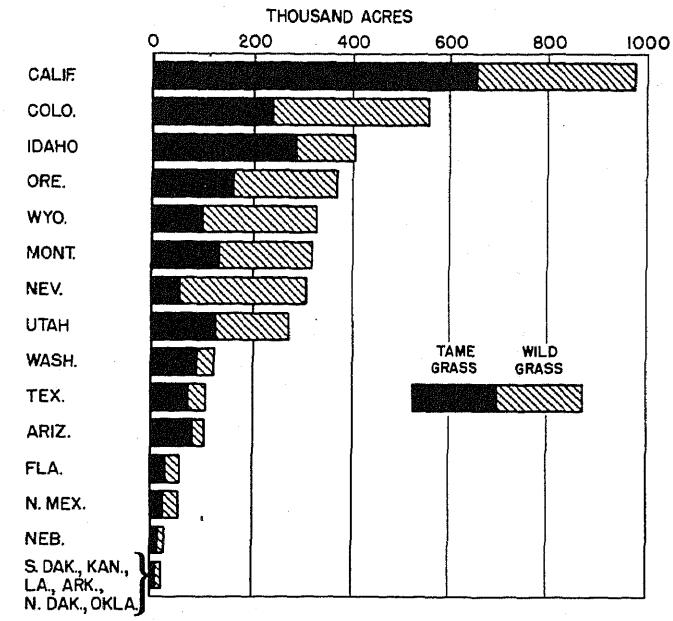
IRRIGATED AND NONIRRIGATED CROPLAND HARVESTED IN IRRIGATED FARMS, BY STATES: 1949



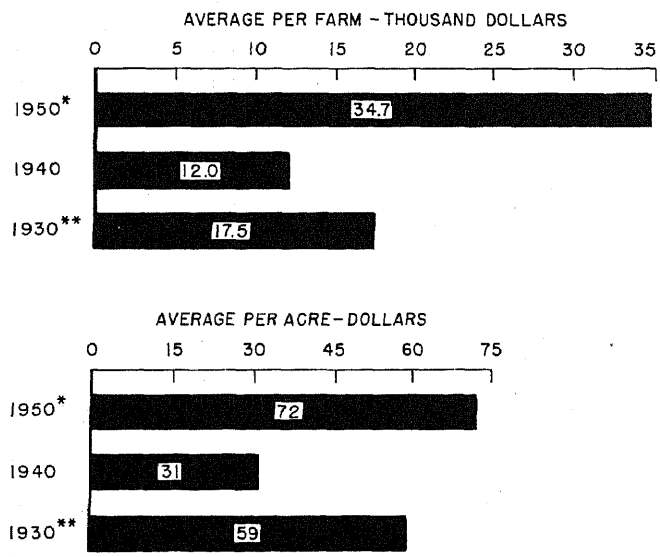
California had over a fourth of the total irrigated cropland harvested in the 20 States. Four States, Colorado, Texas, California, and Idaho, had more than one-half of the acreage of irrigated cropland harvested in the 20 States.

Of the 4 million acres in irrigated pasture, almost 1 million acres were in California and another half-million acres were in Colorado. More than half of the irrigated pasture was tame grass pasture. Almost one-third of the tame grass pasture was in California. The proportion of the irrigated pasture represented by tame grasses varied from 17 percent in Nevada to 77 percent in Arizona.

IRRIGATED TAME GRASS PASTURE AND WILD GRASS PASTURE, BY STATES: 1949

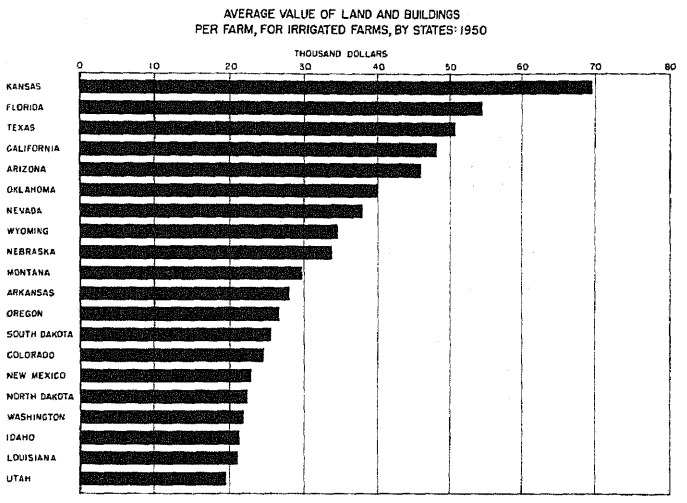


AVERAGE VALUE OF LAND AND BUILDINGS OF IRRIGATED FARMS, PER FARM AND PER ACRE, FOR THE 20 STATES: 1950, 1940, AND 1930



*1950 DATA BASED ON REPORTS FOR ONLY A SAMPLE OF FARM.
**FLORIDA NOT INCLUDED FOR 1930.

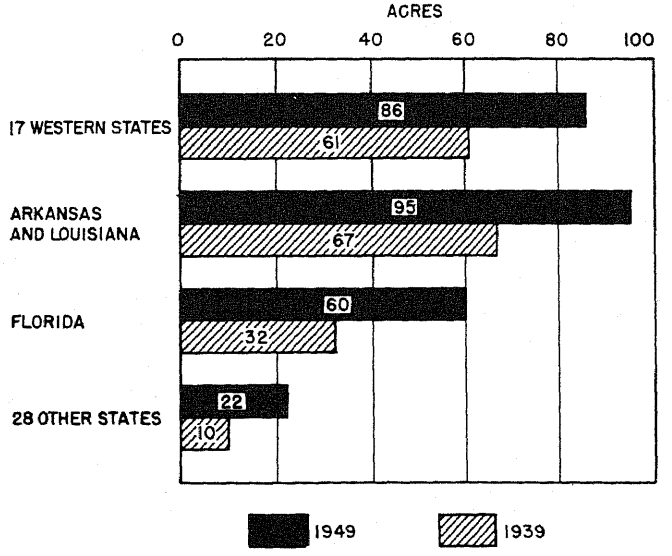
In 1950, the average value of farm land and buildings per irrigated farm was almost $35,000 for the 20 States. This was almost 3 times the value per farm in 1940. The average value of farm land and buildings per acre was $72 in 1950 or almost two and one-half times the average value 10 years earlier.



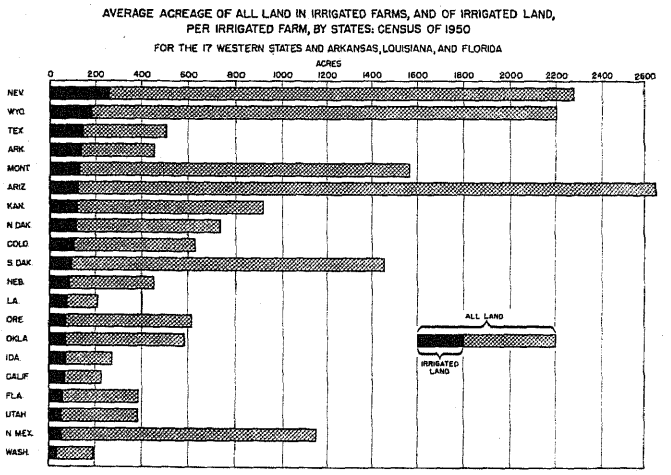
The average value of farm land and buildings in 1950 varied by States from almost $70,000 in Kansas to less than $20,000 in Utah. The average size of farms as well as the average irrigated acreage per farm varied by States and, hence, influenced the relative ranking of States by value of land and buildings per farm.

The average value of irrigated farms per acre in 1950 ranged from a low of $16 in Wyoming to $223 in California. Relatively high average values of irrigated farms per acre were also found in the State of Washington, with an average value of $119; in Florida, with an average of $150; in Louisiana with $105; and in Texas with $99. Other States with low values were South Dakota with $17 per acre and Montana with $20 per acre. The average values per acre are values for the entire farm and do not reflect the relative values of wholly irrigated land. To a large extent the low average values indicated for some of the States resulted from the large acreage of nonirrigated grazing land in farms reporting irrigation.

AVERAGE ACREAGE OF IRRIGATED LAND PER FARM REPORTING IN SPECIFIED AREAS OF THE UNITED STATES: CENSUSES OF 1950 AND 1940

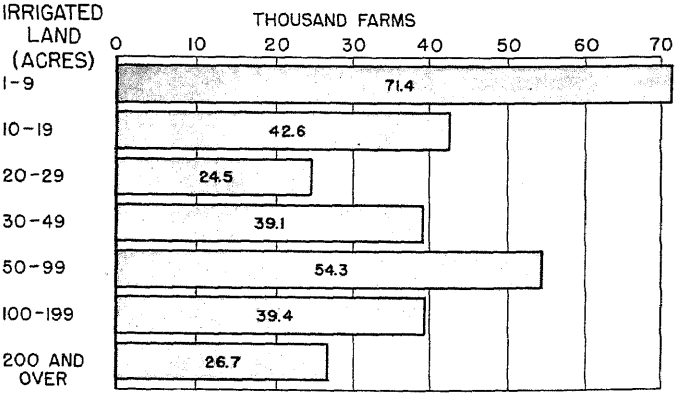


Size and value of irrigated farms.—The average size of irrigated farms in the 20 States was 575 acres in 1950. The average acreage of irrigated land per irrigated farm in 1950 was 85 acres.



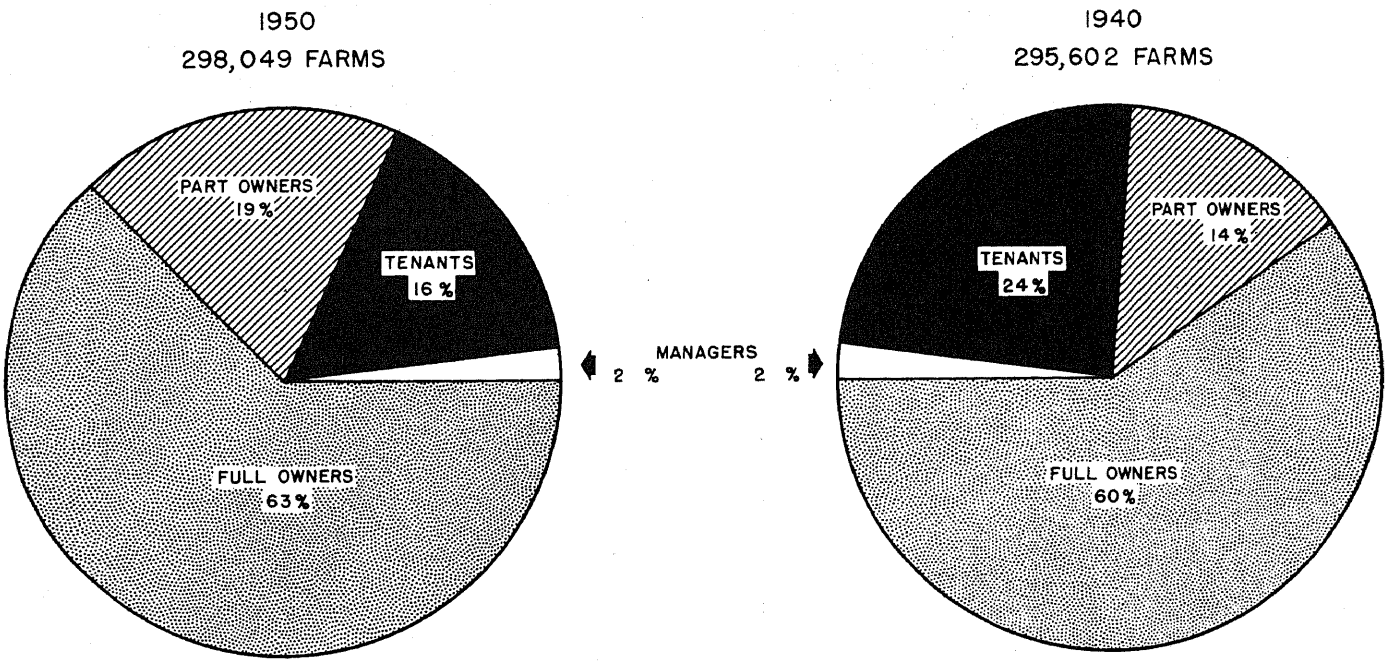
The average size of irrigated farms varied greatly by States. By States, the acreage of irrigated land per farm varied from 258 acres in Nevada to 35 acres in Washington. The average acreage of irrigated land per farm was higher in Arkansas and Louisiana than in the 17 Western States.

NUMBER OF FARMS WITH SPECIFIED ACREAGES OF IRRIGATED LAND, FOR THE 20 STATES: CENSUS OF 1950

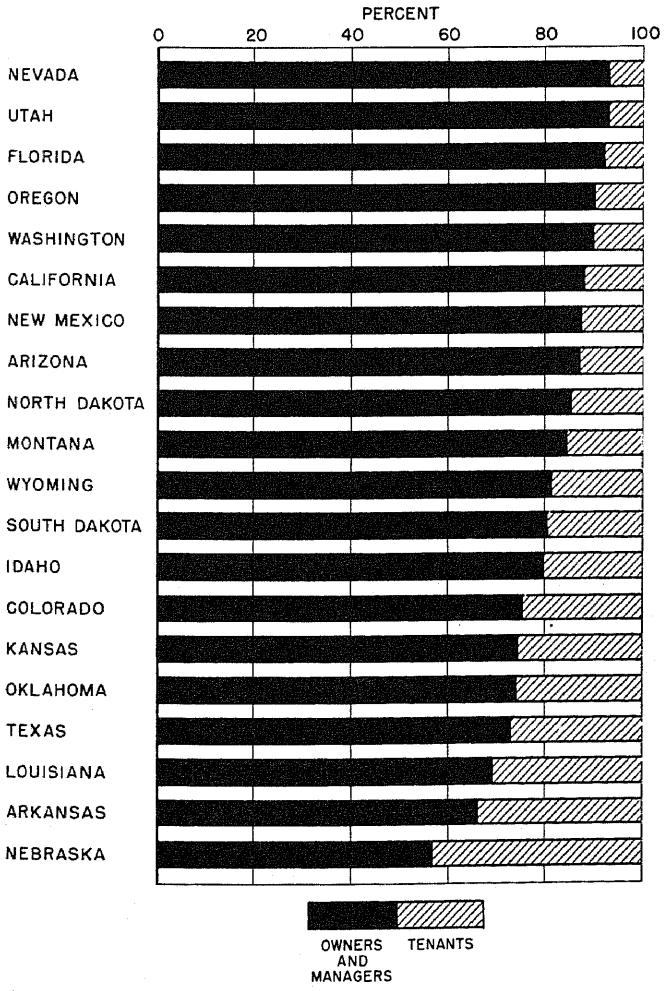


Almost a fourth of all irrigated farms had less than 10 acres of irrigated land, 1 out of 7 had 10 to 19 acres, and only 1 out of 11 had 200 acres or more of irrigated land.

PERCENTAGE OF IRRIGATED FARMS, BY TENURE OF OPERATOR, FOR THE 20 STATES: 1950 AND 1940



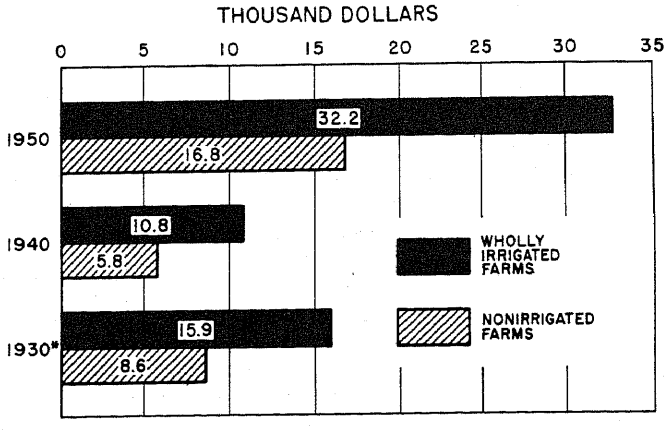
PERCENTAGE DISTRIBUTION OF IRRIGATED FARMS, BY TENURE OF OPERATOR, BY STATES: CENSUS OF 1950



Tenure of operator for irrigated farms.—Almost two-thirds of all irrigated farms were operated by full owners. Full and part owners operated more than 3 out of 4 irrigated farms in 1940, and 4 out of 5 in 1950. The proportion of farms operated by owners and managers varied by States from 57 percent in Nebraska to 93 percent in Utah and Nevada. The percentage of all irrigated farms operated by tenants ranged from 7 percent in Utah and Nevada to 43 percent in Nebraska.

Wholly irrigated, partly irrigated, and nonirrigated farms.—Irrigated farms were classified either as wholly irrigated or partly irrigated. Farms on which all the cropland harvested was irrigated were designated as wholly irrigated farms. All other farms with any irrigated land were designated as partly irrigated farms. Farms with no irrigated land were designated as nonirrigated farms.

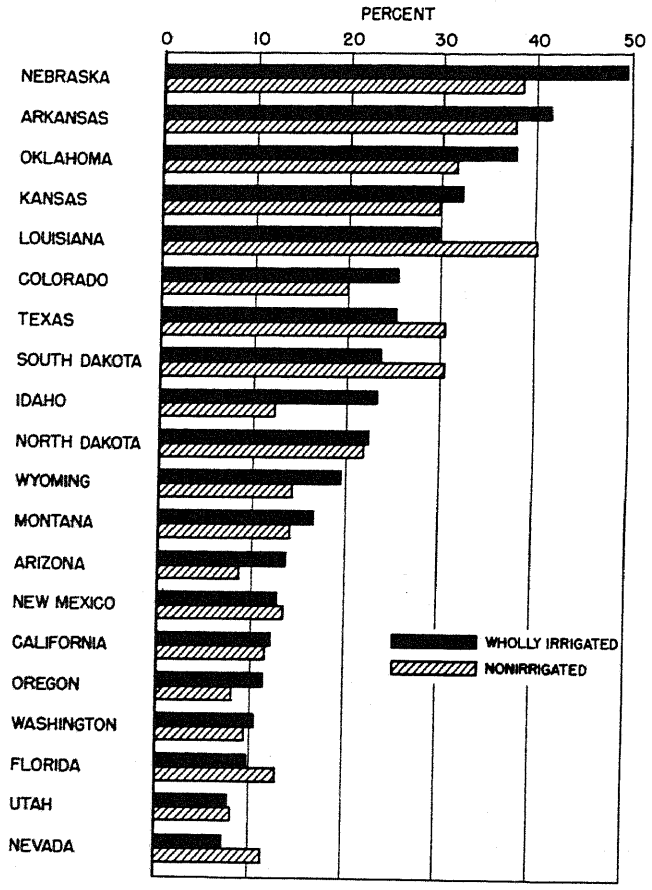
AVERAGE VALUE OF LAND AND BUILDINGS PER FARM FOR WHOLLY IRRIGATED AND FOR NONIRRIGATED FARMS, FOR THE 20 STATES: 1950, 1940, AND 1930



*FLORIDA NOT INCLUDED FOR 1930.

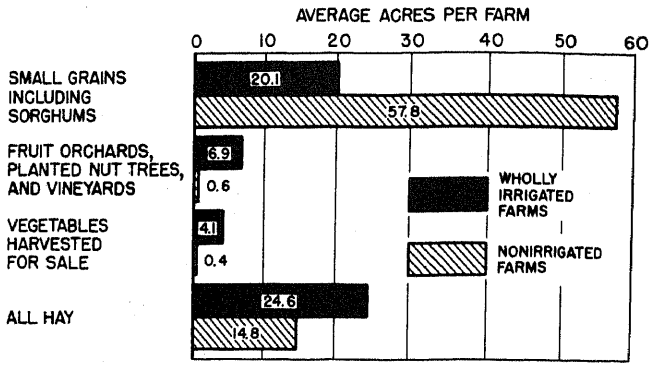
The value of land and buildings for wholly irrigated farms was approximately double the value of land and buildings for nonirrigated farms. The values of irrigated and nonirrigated farms increased from 1940 to 1950 in about the same proportion.

PERCENT OF WHOLLY IRRIGATED AND NONIRRIGATED FARMS OPERATED BY TENANTS, BY STATES: CENSUS OF 1950



A smaller proportion of wholly irrigated farms than of nonirrigated farms was operated by tenants in 1950. This situation is largely the result of the large number of nonirrigated farms operated by tenants in the Southern States. In fact, farm tenancy was higher for irrigated farms than for nonirrigated farms in all of the 20 States except Florida, Louisiana, Nevada, New Mexico, South Dakota, Texas, and Utah.

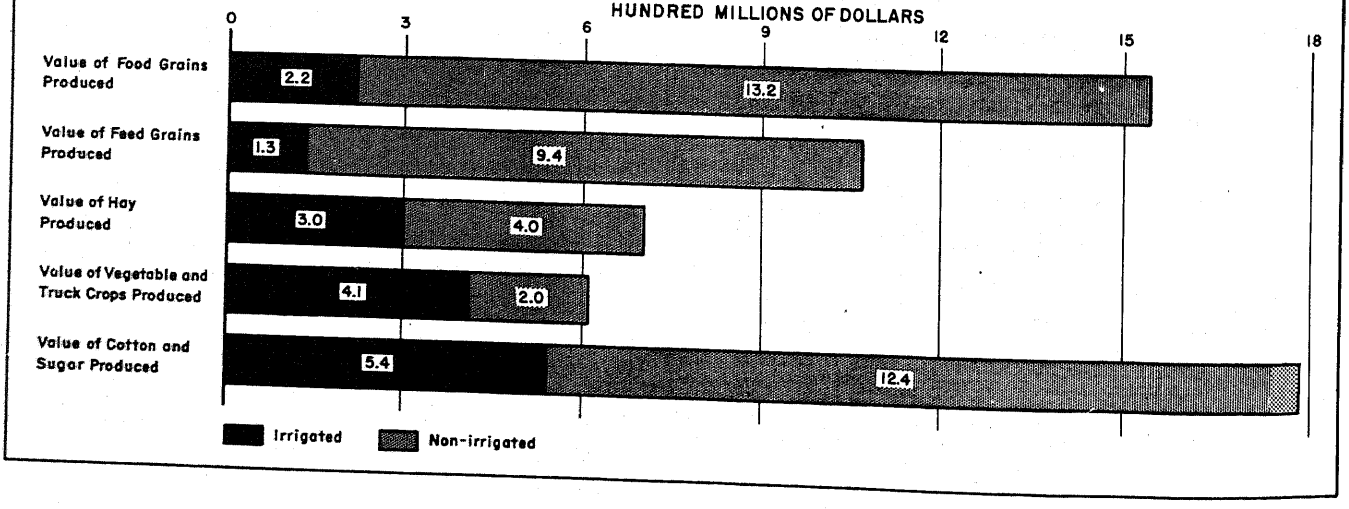
AVERAGE ACREAGE OF LAND PER FARM USED FOR SPECIFIED CROPS, FOR WHOLLY IRRIGATED AND FOR NONIRRIGATED FARMS, FOR THE 20 STATES: CENSUS OF 1950

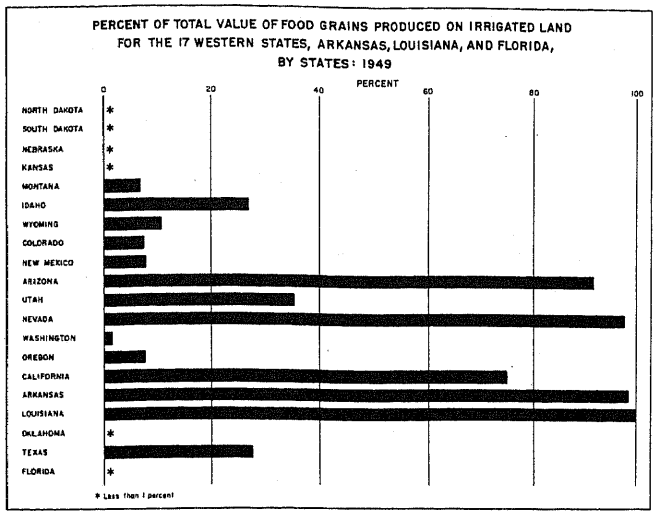


Kinds of crops harvested on wholly irrigated and nonirrigated farms.—The kinds and relative importance of crops harvested were significantly different for wholly irrigated than for nonirrigated farms. Crops that yield high income per acre, such as fruits, nuts, and vegetables, were important on wholly irrigated farms and relatively unimportant on nonirrigated farms. The average acreage of small grains (including sorghums) harvested for irrigated farms was a third that for nonirrigated farms while the average acreage of all hay cut for irrigated farms was almost double that for nonirrigated farms.

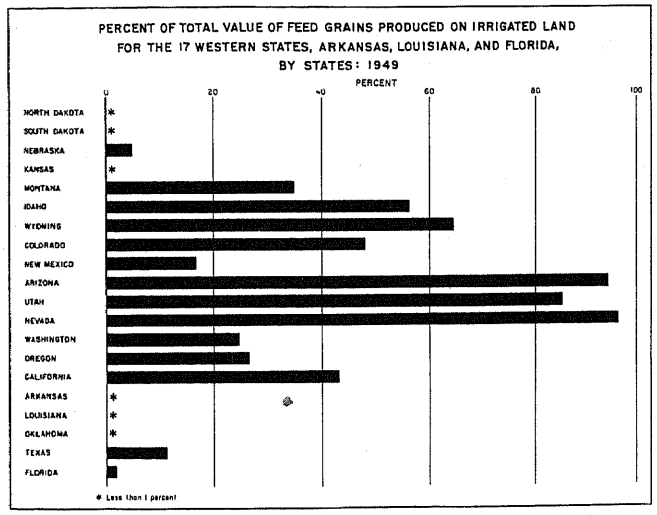
In the 20 States, over two-thirds of the vegetables and truck crops harvested in 1949 came from irrigated land. Likewise, irrigated land produced almost a third of the combined cotton and sugar crops, and three-sevenths of the hay. Less than a sixth of the food grains (wheat, rye, and rice) and less than one-eighth of the feed grains (corn, sorghums, oats, and barley) in the 20 States were harvested from irrigated land.

VALUE OF SELECTED CROPS PRODUCED ON IRRIGATED LAND FOR THE 17 WESTERN STATES, ARKANSAS, LOUISIANA, AND FLORIDA: 1949

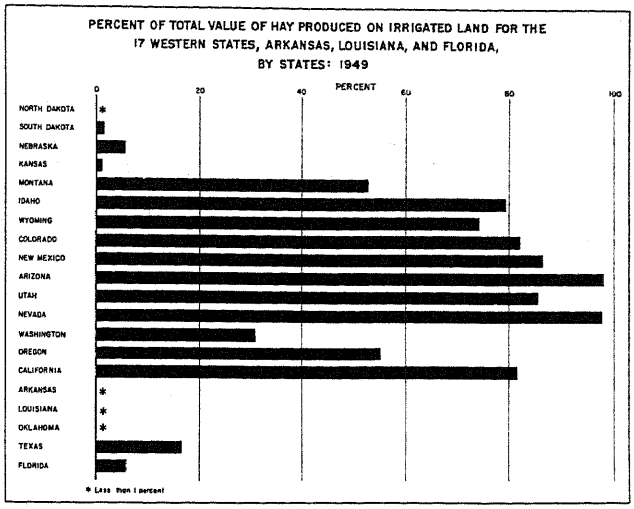




Rice, wheat, and rye comprised the food grains harvested in the 20 States. Irrigated land provided most of the wheat in Arizona and Nevada and all of the rice in California, Arkansas, Louisiana, and Texas. In all these States except Texas, more than two-fifths of the food grains were produced on irrigated land.

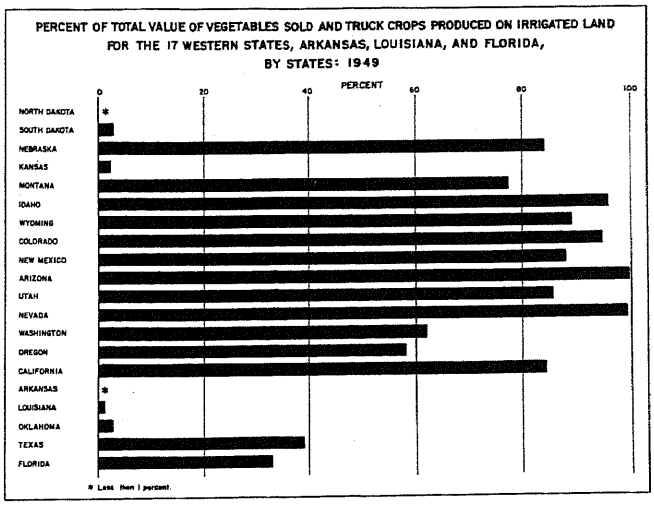


In the States in the Great Basin (California, Oregon, Idaho, Nevada, Utah, and Wyoming), irrigated land provided a significant part of the total production of feed grains. Here feed grains are produced primarily for use for livestock feeding on farms in the same area, usually on the farms on which the feed grains are harvested.

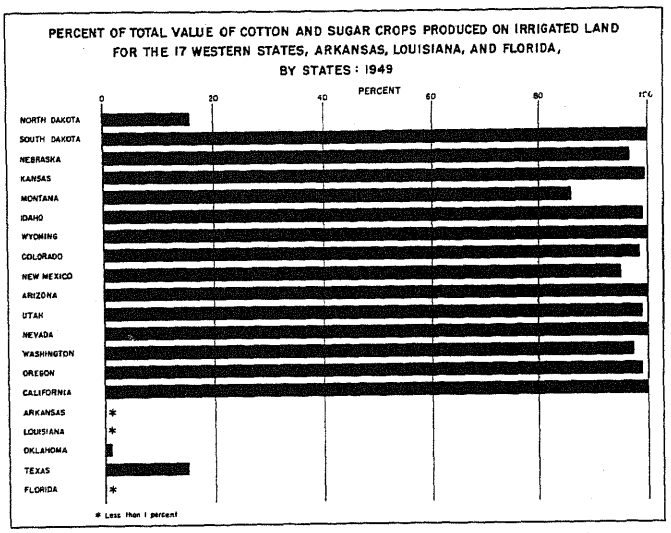


A large part of the production of hay in the Mountain and Pacific States comes from irrigated land. Hay from irrigated land provides vital winter feed for livestock in this area.

Hay occupied almost three-tenths of the irrigated acreage in the 20 States. Hay and forage crops grown on irrigated land provide half the feed for livestock in the 17 Western States. Without the small irrigated areas for hay and feed for winter use, less use could be made of vast areas of western ranges for the grazing of cattle and sheep.



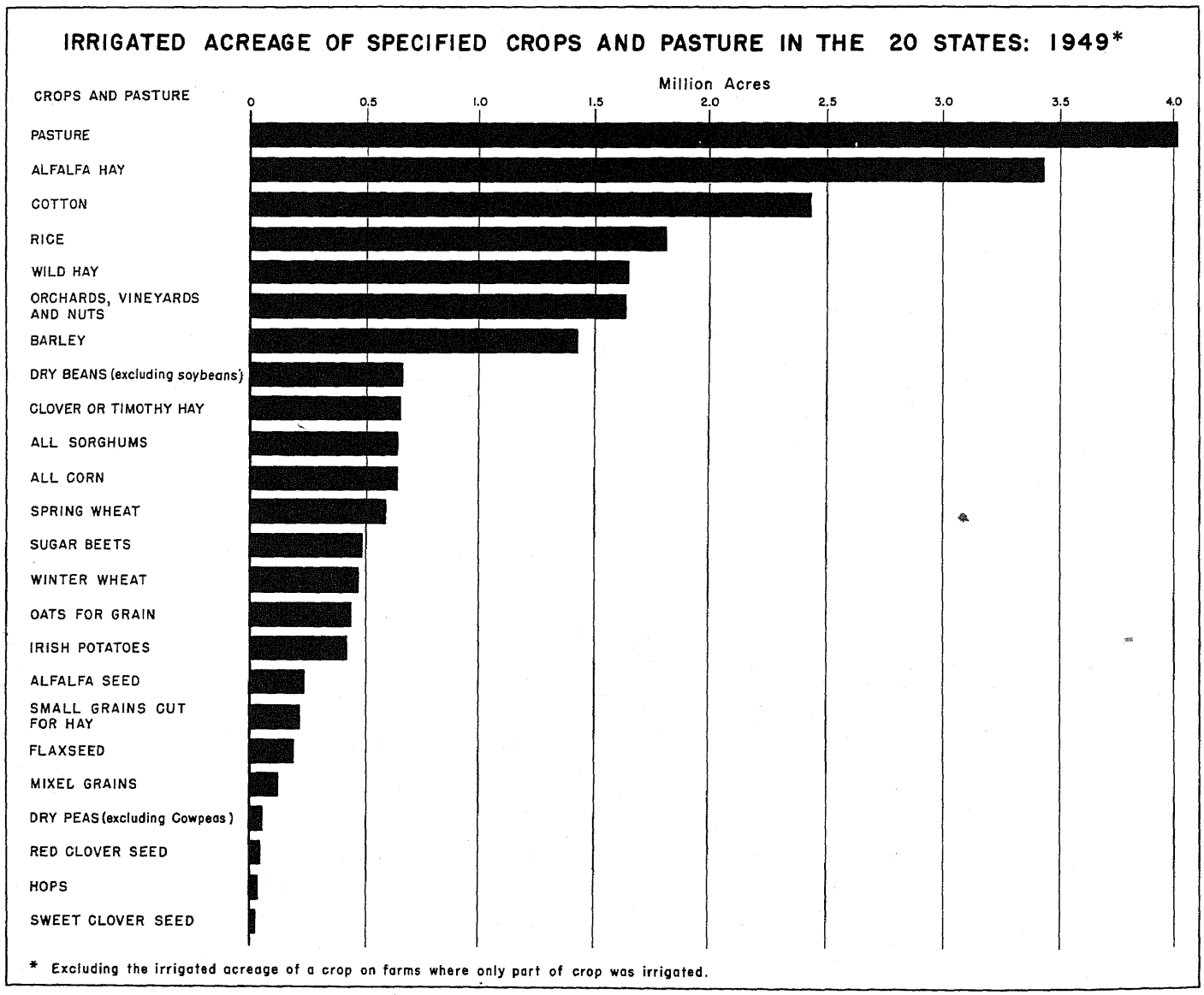
Vegetables and truck crops (Irish potatoes and sweetpotatoes) comprised an important part of the production on irrigated land. A very large part of the production of vegetables and truck crops in the 17 Western States was from irrigated land. Irrigated land also provided a significant part of the vegetable and truck-crop production in Florida.

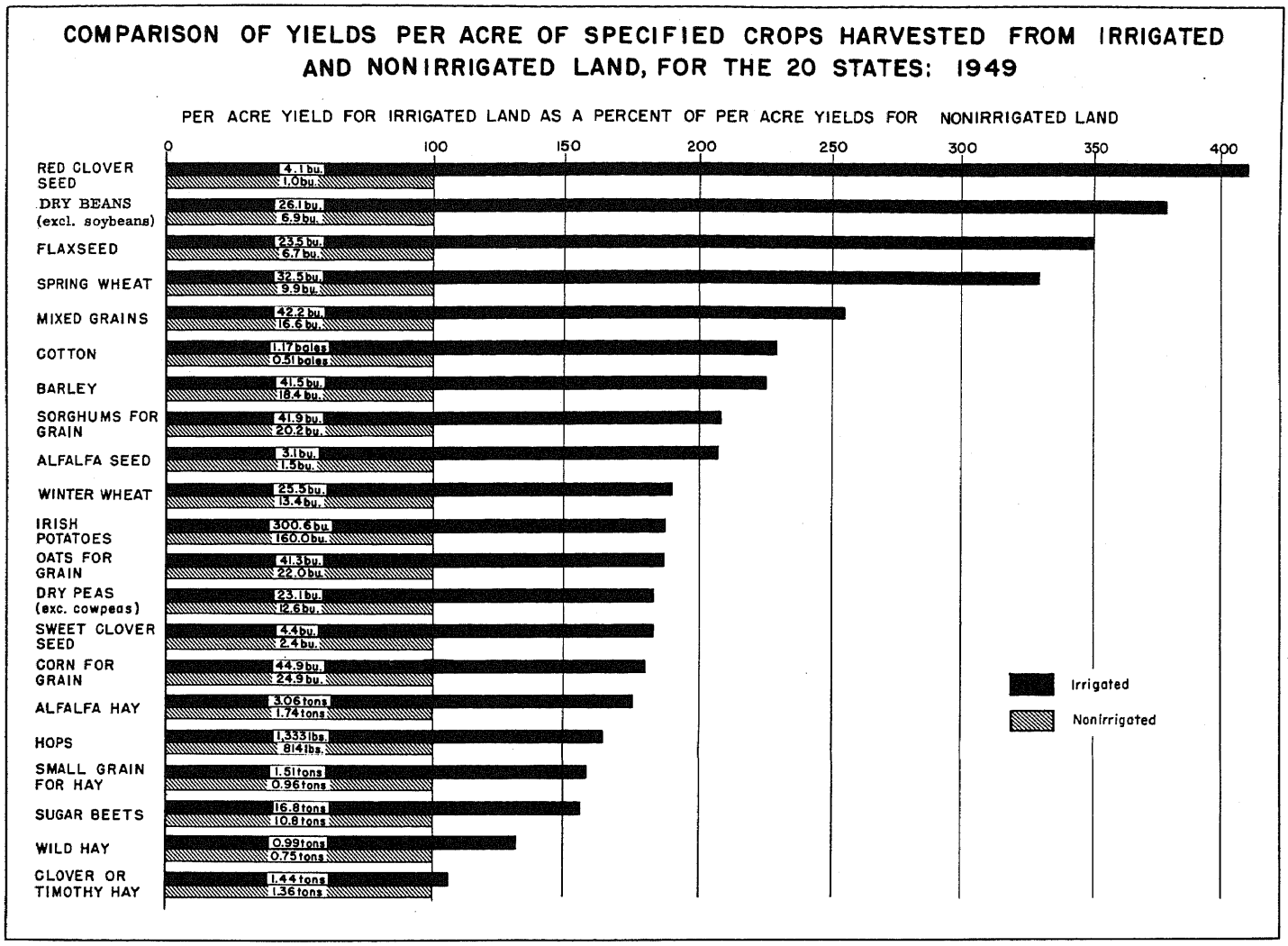


Sugar beets for sugar and cotton are important cash crops harvested from irrigated land. Cotton was a very important irrigated crop in several counties in southern California, and in Arizona, New Mexico, and Texas. Practically all the sugar beets for sugar in the 20 States and nearly all the cotton in Arizona, New Mexico, and California were produced on irrigated land.

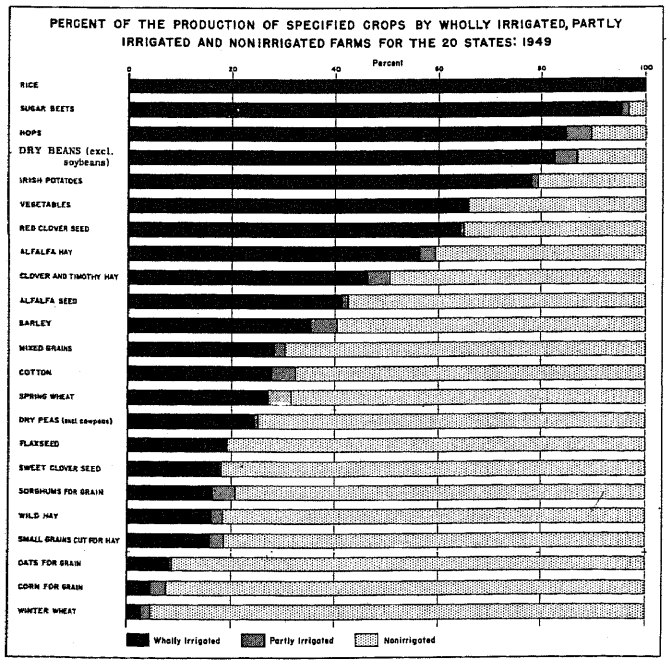
About three-fifths of the Nation's fruit was grown on irrigated land. More than half of the Nation's tonnage was produced in California, a large part of which was from irrigated land.

Irrigated crops.—The figures for irrigated crops relate only to irrigated crops harvested on farms on which the entire acreage of the crop was irrigated. The acreage and production of crops grown on irrigated land in farms on which only a part of the crop was irrigated was relatively unimportant for most crops. On the basis of acreage, pasture, alfalfa hay, cotton, and rice were the four leading irrigated crops.





Yields per acre were much higher for crops harvested from irrigated land than for those from nonirrigated land. However, a part of the difference in yield per acre for irrigated and nonirrigated land may be the result of factors other than the use of irrigation water.



All the rice produced in the 20 States came from irrigated land. Likewise, irrigated land produced four-fifths or more of the sugar beets, hops, dry beans (except soybeans), and Irish potatoes. Irrigated land provided over three-fifths of the vegetable production and more than two-fifths of the red clover and alfalfa seed, and alfalfa and clover or timothy hay harvested in the 20 States. Irrigated land provided only a small part of the production of sorghums, wild hay, oats, corn, and winter wheat. The proportion of the production of crops on 86,715 partly irrigated farms was relatively small for all crops.

The percentages of the U. S. total production harvested from irrigated land in the 20 States for some of the more important crops were as follows:

Crop	*Percent of total*
Rice	100.0
Sugar beets	81.4
Hops	84.8
Dry beans (excluding soybeans)	54.1
Irish potatoes	34.4
Vegetables	39.9
Cotton	18.5
Red clover seed	14.5
Alfalfa hay	29.8
Alfalfa seed	37.8
Barley	26.9

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